Appendix A:
2005 Final Environmental Impact Report (EIR), 2010 Revised and Recirculated Draft EIR No. 1, 2011 Revised and Recirculated Draft EIR No. 2

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A.1 - 2005 Final Environmental Impact Report (EIR) and Appendices

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FINAL

December 2005

Moon Camp Residential Subdivision TT No. 16136 EIR

Lead Agency:

County of San Bernardino

Prepared by:

RBF Consulting

Administrative Draft EIR Completed: August 23, 2002
Public Review Draft EIR Completed: March 23, 2004
Final EIR Completed: December, 2005

F I N A L
ENVIRONMENTAL IMPACT REPORT

MOON CAMP
RESIDENTIAL SUBDIVISION
TENTATIVE TRACT NO. 16136

SCH NO. 2002021105

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December 2005

JN 10-101901

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1.0 Introduction and Purpose

1.0 INTRODUCTION AND PURPOSE

1.1 PURPOSE OF THE EIR

The County of San Bernardino is the Lead Agency under the California Environmental Quality Act (CEQA), and is responsible for preparing the Environmental Impact Report (EIR) for the Moon Camp Residential Subdivision, Tentative Tract No. 16136 project (State Clearinghouse No. 2002021105). This EIR has been prepared in conformance with the CEQA (California Public Resources Code Section 21000 et. seq.), California CEQA Guidelines (California Code of Regulations, Title 14, Section 15000 et. seq.), and the rules, regulations, and procedures for implementation of CEQA, as adopted by the County of San Bernardino. The principal CEQA Guidelines sections governing content of this document are Sections 15120 through 15132 (Content of an EIR), and Section 15161 (Project EIR).

The purpose of this Draft EIR is to review the existing conditions, analyze potential environmental impacts, and identify feasible mitigation measures to avoid or lessen potentially significant effects to a level of non-significance, pursuant to CEQA Guidelines. The project proposes a 95-lot residential subdivision on 62.43 acres along the north shore of Big Bear Lake, in the unincorporated community of Fawnskin. The proposal includes the realignment of North Shore Drive, and a boat dock for 100 slips (for more detailed information regarding the proposal, refer to Section 3.0, *Project Description*).

The EIR has been prepared as a Project EIR, addressing the environmental effects of the proposed project. In accordance with Section 15121 of CEQA, a primary purpose of this EIR is to provide decision makers and the public with specific information regarding the environmental effects associated with development of the site, identify ways to minimize the significant effects and describe reasonable alternatives to the project. Mitigation measures are provided which may be adopted as Conditions of Approval in order to reduce the significance of impacts resulting from the project. In addition, this EIR is the primary reference document in the formulation and implementation of a mitigation monitoring and compliance program for the proposed project.

The County of San Bernardino, which has the principal responsibility of processing and approving the project, and other public agencies (i.e., responsible and trustee agencies, refer to Section 1.5 of this EIR) that may use this EIR in the decision making or permit process will consider the information in this EIR, along with other information that may be presented during the CEQA process. Environmental impacts are not always avoided or lessened to a level considered less than significant; in those cases, impacts are considered significant unavoidable impacts. In accordance with Section 15093(b) of the State CEQA Guidelines, if a public agency approves a project that has significant impacts that are not substantially mitigated (i.e., significant unavoidable impacts), the agency shall state in writing the specific reasons for approving the project, based on the Final EIR and any other information in the public record for the project. This is termed, per Section 15093 of the State CEQA Guidelines, a “statement of overriding considerations.”

This document analyzes the environmental effects of the project to the degree of specificity appropriate to the current proposed actions, as required by Section 15146 of the State CEQA Guidelines. The analysis considers the actions associated with the project, to determine the short-term and long-term effects associated with their implementation. This EIR discusses both the direct and indirect impacts of this project, as well as the cumulative impacts associated with other past, present, and reasonably foreseeable future projects. CEQA requires the preparation of an objective, full disclosure document to inform agency decision makers and the general public of the direct and indirect environmental effects of the proposed action; provide mitigation measures to significantly reduce or eliminate significant adverse effects; and identify and evaluate reasonable alternatives that could avoid or substantially lessen one or more of such effects to the proposed project.

1.2 COMPLIANCE WITH CEQA

The Draft EIR is subject to a 45-day review period by responsible and trustee agencies and interested parties. In accordance with the provision of Sections 15085(a) and 15087(a)(1) of the State CEQA Guidelines, as amended, the County of San Bernardino, serving as the Lead Agency, will: 1) publish a notice of availability of a Draft EIR in "The Grizzly" and "The Sun," newspapers of local and general circulation, respectively; and, 2) will prepare and transmit a Notice of Completion (NOC) to the State Clearinghouse. (Proof of publication is available at the offices of the Lead Agency.)

Any public agency or members of the public desiring to comment on the Draft EIR must submit their comments in writing to the individual identified on the document's NOC prior to the end of the public review period. Upon the close of the public review period, the Lead Agency will then proceed to evaluate and prepare responses to all relevant oral and written comments received from both citizens and public agencies during the public review period.

The Final EIR will consist of the Draft EIR, revisions to the Draft EIR, and responses to comments addressing concerns raised by responsible agencies or reviewing parties submitted during the public review period. After the Final EIR is completed and at least 10 days prior to action, a copy of the specific response to comments made by public agencies on the Draft EIR will be provided to the respective agency.

1.3 EIR SCOPING PROCESS

In compliance with the State CEQA Guidelines, the County of San Bernardino has taken steps to maximize opportunities to participate in the environmental process. During the preparation of the Draft EIR, an effort was made to contact various Federal, State, regional, and local government agencies and other interested parties to solicit comments and inform the public of the proposed project. This included the distribution of an Initial Study and Notice of Preparation (NOP), publication and posting of the NOP, and Public Scoping Meeting on March 2, 2002.

INITIAL STUDY

In accordance with Section 15063(a) of the State CEQA Guidelines, as amended, the County undertook the preparation of an Initial Study. The Initial Study determined that a number of environmental issue areas may be impacted by the construction and build-out of the project. As a result, the Initial Study determined that the Draft EIR should address the project's potentially significant impacts on a variety of environmental issue areas that are addressed in Section 5.0 of this EIR.

Based on the Initial Study, no impacts upon agricultural resources and mineral resources are anticipated as a result of the proposed development. As a result, these issues are addressed in Section 10.0, *Effects Found Not to be Significant*, of this EIR.

NOTICE OF PREPARATION

Pursuant to the provision of Section 15082 of the State CEQA Guidelines, as amended, the County of San Bernardino circulated a NOP via newspaper publication and local posting to public agencies, special districts, and members of the public requesting such notice, for a 30-day period commencing February 21, 2002 and ending March 22, 2002. The purpose of the NOP was to formally convey that the County is preparing a Draft EIR for the Moon Camp Tentative Tract #16136 and General Plan Land Use Amendment, and that as Lead Agency, was soliciting input regarding the scope and content of the environmental information to be included in the EIR. The Initial Study was circulated with the NOP. The NOP, Initial Study, and comments received in response to the NOP are provided in Appendices 15.1 and 15.2 of this EIR.

EARLY CONSULTATION (SCOPING)

During the NOP circulation period, the County of San Bernardino advertised a public scoping meeting. The meeting was held on March 2, 2002 at the North Shore Elementary School at Big Bear Lake and was intended to facilitate public input. The meeting was held with the specific intent of affording interested individuals/groups and public agencies and others a forum in which to orally present input directly to the Lead Agency in an effort to assist in further refining the intended scope and focus of the Project EIR as described in the NOP and Initial Study.

NOP AND SCOPING RESULTS

The following specific environmental concerns were raised by responses to the NOP for the project (the numerical reference in parenthesis is the EIR Section in which the analysis is provided). The NOP responses, and written comments received at the meeting are contained in Appendix 15.2:

NOP Written Comments

- Pebble plain habitat located on-site and adjacent National Forest lands (refer to Section 5.8, *Biological Resources*);
- Recreational activities, including the local paths and trails adjacent to Big Bear Lake (refer to Section 5.2, *Recreation*);
- Impacts to cultural resources (refer to Section 5.9, *Cultural Resources*);
- Wastewater services and facilities (refer to Section 5.3, *Public Utilities*);
- Impacts associated with wastewater odors (refer to Section 5.6, *Air Quality*);
- Hydrology/water quality (i.e., Big Bear Lake) and local water supplies, including drought conditions (refer to Section 5.11, *Hydrology and Drainage*);
- Bald eagle population and supporting habitat (perch trees) (refer to Section 5.8, *Biological Resources*);
- Cumulative impacts to all issue areas for projects in the vicinity of the project site (refer to Section 4.0, *Basis for Cumulative Analysis,* and Section 5.0, *Description of Environmental Setting, Impacts and Mitigation Measures*);
- Impacts associated with light and glare (refer to Section 5.4, *Aesthetics/Light and Glare*);
- Impacts to scenic resources (refer to Section 5.4, *Aesthetics/Light and Glare*);
- Impacts associated with increased traffic (refer to Section 5.5, *Traffic and Circulation* and Section 5.7, *Noise*);
- Air quality impacts, including air pollution from watercrafts, wood burning fireplaces and automobiles (refer to Section 5.6, *Air Quality*);
- Mature/old-growth trees on-site (refer to Section 5.8, *Biological Resources*);
- Biological resources impacts resulting from increased noise levels (refer to Section 5.7, *Noise*);
- Public health and safety associated with increased traffic volumes (refer to Section 5.5, *Traffic and Circulation*);
- Public utilities, including natural gas, water, wastewater and electricity service capabilities (refer to Section 5.3, *Public Utilities*);
- Biological resources, including flora, fauna and habitats located on-site and to the adjacent San Bernardino National Forest Lands. Species include: ashy-grey paintbrush, flycatchers, California spotted owl, herons, hawks, Southern

mountain buckwheat (*Eriogonum kennedyi* var. *austromontamum*) and threatened Bear Valley sandwort (*Arenaria ursine*) (refer to Section 5.8, *Biological Resources*);

- Impacts to wildlife corridors (refer to Section 5.8, *Biological Resources*);
- Affects of seismicity and slope stability (refer to Section 5.10, *Geology and Soils*);
- Impacts to Big Bear Lake from marina construction activities (refer to Section 5.8, *Biological* Resources and Section 5.11, *Hydrology and Soils*);
- Public services, including fire and police protection, libraries, schools, and solid waste disposal (refer to Section 5.3, *Public Services and Utilities*);
- Visual character of the local area (refer to Section 5.4, *Aesthetics/Light and Glare*);
- Impacts to parks and open space (refer to Section 5.2, *Recreation*);
- Impacts to recreational uses of lake (refer to Section 5.2, *Recreation*);
- Impacts from potential future subdivisions of individual lots (refer to Section 5.1, *Land Use and Relevant Planning*);
- Noise generated by traffic and watercraft (refer to Section 5.7, *Noise*);
- Impacts to springs from increased use of Big Bear Lake (refer to Section 5.11, *Hydrology and Drainage*);
- Biological surveys that are seasonal and the length of studies (refer to Section 5.8, *Biological Resources*); and
- Impacts associated with population growth (refer to Section 6.3, *Growth Inducing Impacts*).

<u>March 2, 2002 Public Scoping Meeting</u>

- Impacts to scenic views (refer to Section 5.4, *Aesthetics/Light and Glare*);
- Impacts associated with increased traffic volumes (refer to Section 5.5, *Traffic and Circulation*);
- Impacts associated with tree removal at building sites (refer to Section 5.8, *Biological Resources*);
- Impacts associated with increased light and glare (refer to Section 5.4, *Aesthetics/Light and Glare*);

- Impacts to water quality and supplies (refer to Section 5.11, *Hydrology and Drainage*);
- Impacts to wastewater services and facilities (refer to Section 5.3, *Public Utilities*);
- Impacts to Big Bear Lake water quality (refer to Section 5.11, *Hydrology and Drainage*);
- Public services, including fire and police protection, medical facilities, schools, and parks (refer to Section 5.3, *Public Services and Utilities*);
- Biological surveys that are seasonal and the length of studies (refer to Section 5.8, *Biological Resources*);
- Impacts associated with change in land use designations from BV/RL-40 (40-acre minimum lot size) to BV/RS Single-Residential (refer to Section 5.1, *Land Use and Relevant Planning*);
- Loss of public access through the project site, including the shoreline of Big Bear Lake (refer to Section 5.2, *Recreation*);
- Biological resources, including flora, fauna and habitats located on-site and on San Bernardino National Forest Lands (refer to Section 5.8, *Biological Resources*);
- Public utilities systems, including natural gas, waste disposal and electricity supplies/capabilities (refer to Section 5.3, *Public Services and Utilities*);
- Impacts to wildlife corridors (refer to Section 5.8, *Biological Resources*);
- Impacts resulting from seismic activity (refer Section 5.10, *Geology and Soils*);
- Cumulative traffic impacts to the north shore (refer to Section 5.5, *Traffic and Circulation*);
- Impacts associated with population growth (refer to Section 6.3, *Growth Inducing Impacts*);
- Impacts from odors produced by wastewater (refer to Section 5.6, *Air Quality*);
- Impacts to recreational uses on the lake (refer to Section 5.2, *Recreation*);
- Bald eagle population and supporting habitat (perch trees) (refer to Section 5.8, *Biological Resources*);
- Visual character of the Community of Fawnskin (refer to Section 5.4, *Aesthetics/Light and Glare*);

- Impacts to cultural resources (refer to Section 5.9, *Cultural Resources*);

- Impacts of noise generated by traffic and watercraft (refer to Section 5.7, *Noise*);

- Impacts to air quality, including air pollution from watercrafts, wood burning fireplaces and automobiles (refer to Section 5.6, *Air Quality*); and

- Impacts to slope stability (refer to Section 5.10, *Geology and Soils*).

The EIR focuses primarily on changes in the environment that would result from the proposed project. The EIR identifies potential impacts resulting from the construction and operation of the proposed project and provides measures to mitigate potential significant impacts. Those impacts which cannot be mitigated to levels less than significant are also identified. This EIR addresses impacts in the following areas:

- Land Use and Relevant Planning;
- Recreation;
- Public Services and Utilities;
- Aesthetics/Light and Glare;
- Traffic and Circulation;
- Air Quality;
- Noise;
- Biological Resources;
- Cultural Resources;
- Geology and Soils; and
- Hydrology and Drainage.

1.4 FORMAT OF THE EIR

The Draft EIR is organized into 15 sections. Section 1.0, *Introduction and Purpose*, provides CEQA compliance information. Section 2.0, *Executive Summary*, provides a brief project description and summary of the environmental impacts and mitigation measures. Section 3.0, *Project Description*, provides a detailed project description indicating project location, background and history, and project characteristics, phasing and objectives, as well as associated discretionary actions required. Section 4.0, *Basis for the Cumulative Analysis*, describes the approach and methodology for the cumulative analysis. Section 5.0, *Description of Environmental Setting, Impacts and Mitigation Measures*, contains a detailed environmental analysis of the existing conditions, project impacts, recommended mitigation measures and unavoidable adverse impacts. The analysis of each environmental category in this Section is organized as follows:

- "Existing Conditions" describes the physical conditions which exist at the time the Notice of Preparation was published and which may influence or affect the issue under investigation;

- "Significance Criteria" provides the thresholds which are the basis for conclusions of significance. The primary resource for the criteria is Appendix

G of the State CEQA Guidelines (California Code of Regulations, Section 15000-15387);

- "Project Impacts" describes potential environmental changes to the existing physical conditions which may occur if the proposed project is implemented;

- "Cumulative Impacts" describes potential environmental changes to the existing physical conditions which may occur if the proposed project is implemented together with all other past, present and reasonably foreseeable future projects producing related or cumulative impacts;

- "Mitigation Measures" are those specific measures which may be required of the project in order to avoid a significant impact; minimize a significant impact; rectify a significant impact by restoration; reduce or eliminate a significant impact by preservation and maintenance operations; or compensate for the impact by replacing or providing substitute resources or environment; and

- "Level of Significance After Mitigation" discusses whether the project's impact and the project's contribution to cumulative impacts can be reduced to levels that are considered less than significant.

Section 6.0, *Long-Term Implications of the Proposed Project*, discusses significant environmental changes that would be involved in the proposed action, should it be implemented and discusses growth inducing impacts of the proposed project. Section 7.0, *Alternatives to the Proposed Project*, describes a reasonable range of alternatives to the project or to the location of the project which could feasibly attain the basic project objectives and minimize the potential introduction of significant environmental impacts. Section 8.0, *Inventory of Mitigation Measures*, lists mitigation measures proposed to minimize the significant impacts. Section 9.0, *Inventory of Significance After Mitigation*, describes those impacts which remain significant following mitigation and require a Statement of Overriding Considerations. Section 10.0, *Effects Found Not to Be Significant*, provides an explanation of potential impacts which have been determined not to be significant or significantly below thresholds for significance. Section 11.0, *Organizations and Persons Consulted*, identifies all Federal, State or local agencies, other organizations and individuals consulted. Section 12.0, *Bibliography*, identifies reference sources for the EIR. Section 13.0, *Mitigation Monitoring Program*, identifies responsibilities and timing for monitoring mitigation. Section 14.0, *Comments and Responses,* will be included in the Final EIR and will provide comments and responses pertaining to the Draft EIR. Section 15.0, *Appendices*, contains technical documentation for the project.

1.5 RESPONSIBLE AND TRUSTEE AGENCIES

Certain projects or actions undertaken by a Lead Agency require subsequent oversight, approvals, or permits from other public agencies in order to be implemented. Such other agencies are referred to as *Responsible Agencies* and *Trustee Agencies.* Pursuant to Sections 15381 and 15386 of the State CEQA

Guidelines, as amended, Responsible Agencies and Trustee Agencies are respectively defined as follows:

> *"Responsible Agency"* means a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration. For the purposes of CEQA the term "Responsible Agency" includes all public agencies other than the Lead Agency which have discretionary approval power over the project." (*Section 15381)*
>
> *"Trustee Agency* means a State agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California. Trustee Agencies include...." *(Section 15386, part)*

Responsible and *Trustee Agencies* and other entities which may use this EIR in their decision-making process or for informational purposes include, but may not be limited to, the following:

- Bear Valley Unified School District
- Big Bear Area Regional Wastewater Agency
- Big Bear Community Services District
- Big Bear Lake Department of Water and Power
- Big Bear Municipal Water District
- Big Bear Unified School District
- California Air Resources Board
- California Department of Fish and Game
- California Department of Transportation
- California Division of Forestry
- California Regional Water Quality Control Board
- California State Highway Patrol
- City of Big Bear Lake
- County of San Bernardino Department of Public Health
- County of San Bernardino Department of Public Works, Solid Waste Management Division
- County of San Bernardino Fire Department
- County of San Bernardino Sheriff's Department
- Edison International
- Redlands Water Department
- SANBAG
- South Coast Air Quality Management Agency
- Southern California Association of Governments
- Southern California Gas Company
- State Water Resources Control Board
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Forest Service

1.6 INCORPORATION BY REFERENCE

Pertinent documents relating to this EIR have been cited in accordance with Section 15148 of the CEQA Guidelines, which encourages "incorporation by reference" as a means of reducing redundancy and length of environmental reports. The following documents, which are available for public review at the County of San Bernardino, are hereby incorporated by reference into this EIR. Information contained within these documents has been utilized for each section of this EIR. A brief synopsis of the scope and content of these documents is provided below:

- City of Big Bear Lake Final General Plan EIR, July 1999. The City of Big Bear Lake Final General Plan EIR, a Program EIR, analyzed the potential environmental impacts associated with the City of Big Bear Lake comprehensive update of its General Plan. Comprehensive mitigation and monitoring and reporting programs were developed, through proposed General Plan policies and programs, to address potential impacts. Implementation of the proposed policies and programs reduced potentially significant impacts to less than significant levels for the majority of impacts. To note, a few areas of special concern and sensitivity were given focused consideration in the development of the General Plan Update. These areas include Biological Resources, Water Resources and Air Quality. Impacts to Biological and Water Resources were reduced to less than significant levels. However, the EIR states that impacts to air quality would continue to be impacted by criteria pollutants associated with traffic. Information in the General Plan EIR was primarily utilized in the Moon Camp EIR as background data.

- County of San Bernardino General Plan, adopted 1989, revised 2001. The County of San Bernardino General Plan Update is the long-range planning guide for growth and development for the County of San Bernardino. The General Plan has two basic purposes: 1) to identify the goals for the future physical, social and economic development of the County; and 2) to describe and identify policies and actions adopted to attain those goals. It is a comprehensive document that addresses seven mandatory elements/issues in accordance with State law. These elements include Land Use, Housing, Circulation, Conservation, Open Space, Noise and Safety. Other optional issues that affect the County have also been addressed in the Plan. The County General Plan was utilized throughout this EIR as the fundamental planning document governing development on the project site. Background information and policy information from the Plan are cited in several sections of the EIR.

- County of San Bernardino General Plan EIR, 1989. The purpose of the General Plan EIR, a Program EIR, is to provide basic analysis of the potentially significant effects on the human and natural environment which may occur during the implementation of the General Plan Update. The General Plan's implementation program incorporates mitigation measures. However, project-specific impacts are assessed at the application stage. The General Plan's Program EIR provides a fundamental base from which environmental review will occur.

The most important feature of the General Plan EIR is its thresholds. The thresholds provide a commonly acceptable level for assessing project impacts on the environment. A project which has impacts below the threshold may be reviewed using the Mitigated Negative Declaration process. Projects which have impacts above the thresholds provide advance information allowing an applicant to submit the necessary information to determine if the impact can be mitigated through conventional means. If an impact cannot be mitigated through accepted practices, then normally, an environmental impact report for that project will be required.

- County of San Bernardino Development Code, adopted 1989, revised 2001. The County Development Code provides the regulations which must be followed by every project within the County's jurisdictional area. Information within the Code was utilized in various sections of this EIR, particularly as it relates to the range of permitted uses within the BV/RS Single Residential designation (refer to section 5.1, *Land Use and Relevant Planning*) and for the identification of additional constraints and requirements which govern development.

2.0 Executive Summary

2.0 EXECUTIVE SUMMARY

2.1 PROJECT ANALYSIS SUMMARY

The proposed Moon Camp Tentative Tract #16136 Residential Subdivision ("Moon Camp") encompasses approximately 62.43 acres along the northwest shore of Big Bear Lake, in the community of Fawnskin, County of San Bernardino. The Project site is located adjacent to the northwest shore of the Big Bear Lake, in the relatively undeveloped eastern portion of Fawnskin. The Project site is generally situated between Flicker Road to the north, Big Bear Lake to the south, Polique Canyon Road to the east, and Oriole Lane/Canyon Road to the west.

The Project proposes a 95-lot residential subdivision with lots ranging in size from 0.17 acres (7,292 square feet) to 2.11 acres. Lots would be sold individually and development of lots and construction of homes would be by custom design. The proposal is a Tentative Tract Map for 92 numbered and three lettered lots. The three lettered lots are identified as follows: (1) Lot "A" is a private street designed to provide access to the southernmost lots; (2) Lot "B" is a 1.4-acre strip of land that would remain between the relocation of State Route 38 and the private Street, Lot "A"; and (3) Lot "C" is a gated entrance to the Project, including a proposed boat dock, consisting of 100 boat slips, which would be available for use by residents of the tract and accessible by Lot "C".

The Project includes relocation of North Shore Drive, also referred to as State Route 38, to allow development of lakeshore lots. An approximately 2,498-foot segment of the roadway would be relocated. The maximum distance of relocation, as designed, is 207 feet to the north. The design includes a 76-foot road width, with 14-foot shoulder/bikeway access, resulting in a 104-foot right-of-way via a loop road that would include five separate cul-de-sac drives to access lakefront lots.

This EIR includes a comprehensive review of project affects, the significance of the affects and recommended mitigation measures. Section 5.0 of this EIR concludes that the proposed Project would generate impacts related to public services, utilities, aesthetics, traffic/circulation, air quality, noise, biological resources, cultural resources, geology/soils and hydrology/drainage. All impacts, with the exception of those identified for public services/utilities (ability to be served water), aesthetics, air quality, biological resources and hydrology (groundwater) can be mitigated to less than significant levels. The identified public services/utilities (ability to be served by water), aesthetic, air quality, biological resources and hydrology (groundwater) impacts require findings in accordance with Section 15091 of CEQA and a Statement of Overriding Considerations in accordance with Section 15093 of CEQA.

2.2 ENVIRONMENTAL ISSUES/MITIGATION SUMMARY

The following is a brief summary of the impacts, mitigation measures, and unavoidable significant impacts identified and analyzed in Section 5.0 of this EIR. Refer to the appropriate EIR Section for additional information.

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
5.1	**LAND USE AND RELEVANT PLANNING**		
	San Bernardino County General Plan		
	5.1-1 *The proposed Project conflicts with the land use plan, policies and regulations set forth in the San Bernardino County General Plan. Analysis has concluded that impacts would be less than significant with approval of a Land Use District Change and Circulation Element Amendment (Transportation/ Circulation Maps).*	5.1-1 No mitigation measures are recommended.	No unavoidable significant impacts related to Land Use and Relevant Planning have been identified following compliance with the San Bernardino County General Plan and Development Code policies and standards.
	San Bernardino County Development Code		
	5.1-2 *The proposed Project conflicts with the land use plan, policies and regulations of the San Bernardino County Development Code. Analysis has concluded that a less than significant impact would occur with approval of a Land Use District Change, Circulation Element Amendment and Conditional Use Permit.*	5.1-2 No mitigation measures are recommended.	
	Cumulative		
	5.1-3 *The proposed Project, combined with other future development, will increase the intensity of land uses in the area. Analysis has concluded that impacts are less than significant and no mitigation is required. Projects are evaluated on a project-by-project basis in accordance with the San Bernardino County General Plan and Development Code.*	5.1-3 No mitigation measures are recommended.	
5.2	**RECREATION**		
	Expansion and/or Construction of Recreational Facilities		
	5.2-1 *Implementation of the Moon Camp project involves the construction or expansion of recreational facilities which may have an adverse physical*	5.2-1 No mitigation measures are recommended.	No significant impacts related to Recreational facilities have been identified in this Section.

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	effect on the environment. Compliance with the Big Bear MWD standards and permit requirements would reduce impacts to a less than significant level.		
	Public Access		
	5.2-2 *Implementation of the Moon Camp project would ~~not~~ affect public access along the north shore of Big Bear Lake. Mitigation requiring dedication of an easement along the south side of North Shore Drive has been incorporated. ~~The Project site is Private Property. Affects on public access are concluded as less than significant.~~*	5.2-2 ~~No mitigation measures are recommended.~~ The proposed project shall be conditioned to incorporate a pedal path easement along the south side of North Shore Drive, prior to map recordation.	
	Cumulative		
	5.2-3 *Cumulative development may result in increased use of existing recreational areas/facilities, thereby creating the potential for physical deterioration. Additionally, cumulative development may include recreational facilities (i.e., marina) that have the potential to result in physical impacts on the environment. Mitigation measures necessary for reducing impacts are addressed on a project-by-project basis to reduce impacts to a less than significant level.*	5.2-3 No mitigation measures are recommended.	
5.3	**PUBLIC SERVICES AND UTILITIES**		
	Fire Protection		
	5.3-1 *Project implementation could result in significant physical impacts with respect to fire protection. Analysis has concluded that impacts would be less than significant with the recommended mitigation measures.*	5.3-1a The fire flow requirement shall be 1750 gpm @ 2 hours based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm @ 2 hours for homes greater than 4,800 square feet.	
		5.3-1b ~~Fire sprinklers for each residence shall be provided in lieu of additional manpower.~~ All residences less than 5,000 square feet shall be subject to the standard fire sprinkler requirement (NFPA 13D). Homes above 5,000 square feet shall be subject to the NFPA13R~~have a larger~~ sprinkler requirement ~~(FPA13R)~~.	
		5.3-1c A ~~f~~Fuels ~~modification program~~Management Plan, with specifications, shall be prepared and	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		subject to approval by the County of San Bernardino Fire Department and San Bernardino National Forest Service. The Fuels Management Plan shall implement the fire safety requirements of the FS1 Fire Safety Overlay District, including a 30-foot minimum setback requirement from the National Forest. The fuel modification zone shall be located entirely within the project's boundaries. ~~The 100 foot fuel modification requirement shall not terminate at a property line. The 100 foot fuel modification requirement shall extend beyond property lines. Where such fuel modification zone extends onto U.S. Forest Service land, an easement or permit shall be required to be obtained.~~ The minimum~~100 foot~~ fuel modification zone requirements may be greater in steeper areas (up to 300 ft.), as determined by the Fire ~~Agency~~ Department.	
		5.3-1d Cul-de-sac lengths shall be no longer than 350 feet.	
		5.3-1e A Homeowner's Association or a Special District shall be established to ~~assure~~ implement the Fuels Management Plan. The Fuels Management Plan shall specify any professional assistance, if necessary, to implement the action portion of the plan. The Plan shall determine if a Registered Professional Forrester is necessary for professional guidance to implement the Plan. ~~Long term vegetation maintenance. An annual vegetation maintenance program shall be included.~~ The HOA or Special District is to be responsible for fuel modification in common areas.	
		~~5.3-1f Fire resistance/drought tolerant landscaping shall be required and referenced in the Homeowner's Association or Special District Standards.~~	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	Police Protection		
	5.3-2 *Project implementation could result in significant physical impacts with respect to police protection. Analysis has concluded that a less than significant impact would occur.*	5.3-2 No mitigation measures are recommended.	
	Schools		
	5.3-3 *Project implementation could result in significant physical impacts to existing school facilities. Potential impacts to school facilities are concluded as less than significant following payment of school impact fees and compliance with all applicable requirements, codes, and ordinances.*	5.3-3 No mitigation measures are recommended.	
	Libraries		
	5.3-4 *Project implementation would increase the demand on library services. Analysis has concluded that that a less than significant impact would occur.*	5.3-4 No mitigation measures are recommended.	
	Wastewater		
	5.3-5 *Project implementation would generate additional wastewater beyond current conditions. Analysis has concluded that impacts would be less than significant with the recommended mitigation measures.*	5.3-5a Prior to issuance of building permits, the Project Applicant shall fund all on-site and off-site sewer improvements required to support development of the Project site. Such improvements shall be to the satisfaction of the BBARWA, and may include replacement of existing sewer lines rather than construction of parallel lines. 5.3-5b Prior to issuance of building permits, the Project Applicant shall provide evidence to the County of San Bernardino that the BBARWA has sufficient transmission and treatment plant capacity to accept sewage flows from the Project site. 5.3-5c The Project Applicant shall relocate the BBARWA 10" force main by installing new pipe (and/or bonding for the relocation) so that it is aligned within the south shoulder of the relocated State Route 38. The 10" force main shall be accessible for BBARWA to maintain and repair the sewer force main. The force main shall not pass through residential lots within the proposed tract.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		5.3-5d The Project Applicant shall install air release valves and vaults at high elevation points on the new force main to minimize odors. Air release valves shall be large enough to enclose 55-gallon drum carbon filters to control odors.	
	Water		
	5.3-6 *Project implementation would increase the demand for water beyond existing conditions. Analysis has concluded that due to the inability of water providers to confirm service to the project, impacts are concluded as significant and adverse. This conclusion is further supported by the potentially significant groundwater overdraft conditions cited in Section 5.11 of the EIR.*	5.3-6a ~~Prior to approval of building permits, a video inspection of water supply casings and screen shall be conducted in order to update~~ Values of production rates and pumping levels for on-site water supply wells shall be obtained through step-drawdown and constant rate pumping tests. Water samples shall be taken during the inspection for testing and analysis in accordance with standard requirements. 5.3-6b If either or both of the two existing on-site wells are utilized as a water source for the project, ~~T~~the Project Applicant shall equip the~~two existing on-site~~ wells to meet DWP and/or County Special Districts Department standards and dedicate these facilities and water rights to the appropriate water purveyor~~County of San Bernardino~~. Within the proposed tract, no individual private irrigation wells shall be permitted. 5.3-6c ~~If served by CSA 53-C through a contract with the City of Big Bear Lake Department of Water and Power, t~~ After a determination has been made regarding the water purveyor, the Project Applicant shall advance fair-share funds ~~or enter into a reimbursement agreement with the~~ to the appropriate water agency (CSA and/or DWP)~~(if required)~~ towards constructing a new reservoir and pipeline improvement at Cline-Miller Reservoir (with an estimated project cost at $481,100). These facilities would be dedicated to the appropriate water agency. 5.3-6d The following water conservation measures are the minimum measures that shall be complied with in conjunction with domestic water supply to the project. A Homeowners Association shall be	Due to the inability of water providers to confirm service to the project, project as well as cumulative impacts are concluded as significant and unavoidable. This conclusion is further supported by the significant and unavoidable conclusion cited in Section 5.11, *Hydrology and Drainage*, due to inconclusive testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit. If the County of San Bernardino approves the project, the County shall be required to adopt findings in accordance with Section 15091 of the CEQA Guidelines and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the CEQA Guidelines. No additional unavoidable significant impacts related to public services and utilities have been identified following implementation of the recommended mitigation measures and compliance with applicable County, service or utility provider requirements, County Codes and Ordinances.

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION

responsible for enforcing the water conservation measures. Additional measures may be imposed as a result of a contract for water supply between CSA 53-C and the City of Big Bear Lake DWP:

- Landscape shall not be irrigated between the hours of nine (9) a.m. and six (6) p.m.
- Residences, buildings and premises shall be limited to watering every other day.
- Landscape irrigation shall be limited to what is needed and shall not be excessive. Water from landscape irrigation shall not be allowed to run off into streets.
- Water shall not be allowed to leak from any waterline, faucet, or any other facility, either within or outside a private residence, business establishment or on private property. All such leaking waterlines, faucets, and other facilities shall be repaired immediately to prevent leakage.
- Sidewalks, paved driveways, and parkways shall not be washed off with hoses, except as required for sanitary purposes.
- Non-commercial washing of cars, and boats or any other vehicle shall only be done with an automatic shut-off nozzle on a hose, or with a bucket.
- New landscaping shall not exceed more than one-thousand square feet of turf on a parcel or lot or twenty-five percent of the available landscape area.
- A model landscaping and irrigation guide shall be prepared for the tract and required by homeowner association rules. The guide shall specify a plant palate that emphasizes native plants and cultivars that are suitable for the mountain climate. Plant materials shall be low water consuming and fire resistant. Irrigation shall emphasize drip and bubbler type emitters with limit aerial spray

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		irrigation methods. The guide shall be reviewed and approved by the Land Use Services Department.	
	Solid Waste		
5.3-7	*Development of the Project area would result in increased solid waste generation. Project compliance with the Integrated Waste Management Plan for the County of San Bernardino (currently being revised) would reduce the amount of solid waste which is ultimately disposed of at the Barstow Landfill and maintain potential impacts at a less than significant level.*	5.3-7 No mitigation measures are recommended.	
	Natural Gas		
5.3-8	*Project implementation would result in an increased demand for natural gas service beyond existing conditions and would require expansion of the existing gas system. Analysis has concluded that a less than significant impact would occur in this regard.*	5.3-8 No mitigation measures are recommended.	
	Electricity		
5.3-9	*Project implementation would result in an increased demand for electrical service beyond existing conditions and would require expansion of the existing electrical system. Analysis has concluded that impacts would be less than significant.*	5.3-9 No mitigation measures are recommended.	
	Cumulative Impacts		
5.3-10	*Cumulative development could result in an increased demand for public services and an increase in the consumption rates for public utilities, potentially requiring expansions of the existing utility systems. The inability of water providers to confirm service on a project level would also result in significant and unavoidable cumulative impacts. Analysis has concluded that cumulative development for the remaining service and utility affects are subject to standards and requirements of reviewing agencies and no additional mitigation is recommended.*	5.3-10 No mitigation measures are recommended.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
5.4	**AESTHETICS/LIGHT AND GLARE**		
	Short-Term Aesthetic/Light and Glare Impacts		
	5.4-1 *Construction of the proposed project would temporarily alter the visual appearance of the site and introduce new short-term sources of light and glare. Analysis has concluded that impacts would be reduced to less than significant levels with implementation of the recommended mitigation measures.*	5.4-1a Construction equipment staging areas shall be located away from existing residential uses. Appropriate screening (i.e., temporary fencing with opaque material) shall be used to buffer views of construction equipment and material, when feasible. Staging locations shall be indicated on project Grading Plans. 5.4-1b All construction-related lighting associated with the construction of new roadways, the realignment of State Route 38, and the installation of utilities shall be located and aimed away from adjacent residential areas. Lighting shall use the minimum wattage necessary to provide safety at the construction site. A construction safety lighting plan shall be submitted to the county for review concomitant with Grading Permit applications for the subdivision of the lots.	Significant and unavoidable impacts related to Aesthetics/Light and Glare have been identified for viewshed alterations involving existing residents to the north, east and west of the project site. Additionally, significant and unavoidable impacts have been identified for views from State Route 38, a scenic highway, to the south and from the south shore of Big Bear Lake. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA.
	Long-Term Aesthetic Impacts		
	5.4-2 *Implementation of the Moon Camp project would adversely impact scenic resources, scenic vistas and the visual character of the site and its surroundings. Analysis has concluded that a significant and unavoidable impact to the visual character and viewshed from the project site and surrounding areas would occur which cannot be mitigated to a less than significant level.*	5.4-2a Roof pitches shall not exceed 9/12 and no higher than two-story for any portion of the structure footprint for lots 62-92. 5.4-2b All homes shall provide a two-car garage with automatic garage doors. 5.4-2c A view envelope for each property shall be established by creating a line starting at 6 feet at each side lot line and moving up at a 30 degree angle until both lines meet at the middle of the property. The area located under these lines is the view envelope. Structures shall not protrude outside the view envelope. The view envelope orients the building ridgeline parallel to the view corridors on narrower lots providing views for residents located behind the property.	No additional significant impacts related to Aesthetic/Light and Glare have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		5.4-2d New development shall be subordinate to the natural setting and minimize reflective surfaces. Building materials including siding and roof materials shall be selected to blend in hue and brightness with the surroundings. Colors shall be earth tones, shades of grays, tans, browns, greens, pale yellows, and shall be consistent with the mountain character of the area.	
		5.4-2e Outside parking/storage areas associated with the boat dock activities shall be completely screened from view by the placement of landscaping and plantings which are compatible with the local environment and, where practicable, are capable of surviving with a minimum of maintenance and supplemental water.	
		5.4-2f Construction plans for each individual lot shall include the identification and placement of vegetation with the mature height of trees listed. Landscaping and plantings should not obstruct significant views, within or outside of the project, either when installed or when they reach mature growth. The removal of existing vegetation shall not be required to create views.	
		5.4-2g A Note shall be placed on the Composite Development Plan stating that during construction plans review and prior to issuance of building permits for each lot, the building inspector shall refer to the Mitigation Monitoring and Compliance Program regarding these aesthetic impact mitigation measures. The building inspector shall coordinate with the Advance Planning Division the review and approval of building plans in relation to these aesthetic impact mitigation measures, prior to approval and issuance of building permits.	
	Long-Term Scenic Highway Impacts		
	5.4-3 *Implementation of the Moon Camp project would impact views of Big Bear Lake, the distant mountain ranges to the south and adjacent forest areas from North Shore Drive*	5.4-3a Any entry sign for the development shall be a monument style sign compatible with the mountain character, preferably, rock or rock-appearance.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	(State Route 38) which is a County and Federally recognized Scenic Highway/Byway. Analysis has concluded that significant and unavoidable impacts would occur as a result of project development.	5.4-3b Prior to recordation of the tract map (and/or any ground disturbance, whichever occurs first), landscaping plans for lettered lots B and C shall be submitted to and approved by the San Bernardino County Planning Department.	
	Long-Term Light and Glare Impacts		
	5.4-4 *The proposed Moon Camp project would introduce additional light and glare on-site which may affect the surrounding residents. Analysis has concluded that potential impacts would be reduced to less than significant levels with implementation of the recommended mitigation measures.*	5.4-4a All exterior lighting shall be designed and located as to avoid intrusive effects on adjacent residential properties and undeveloped areas adjacent to the project site. Low-intensity street lighting and low-intensity exterior lighting shall be used throughout the development to the extent feasible. Lighting fixtures shall use shielding, if necessary to prevent spill lighting on adjacent off-site uses. 5.4-4b Lighting used for various components of the development plan shall be reviewed for light intensity levels, fixture height, fixture location and design by an independent engineer, and reviewed and approved by the County Building and Safety Division. 5.4-4c The project shall use minimally reflective glass. All other materials used on exterior buildings and structures shall be selected with attention to minimizing reflective glare. 5.4-4d Vegetated buffers shall be used along State Route 38 to reduce light intrusion on residential development and on forested areas located adjacent to the project site. 5.4-4e Mitigation Measures 5.4-4a through 5.4-4d shall be included within the Conditions, Covenants and Restrictions (CC&Rs) of the Home Owner's Association (HOA). 5.4-4f All outdoor light fixtures shall be cutoff luminaries and shall only use high- or low-pressure sodium lamps. 5.4-4g The Project Applicant/Developer shall install light colored, reflective roof products. Such roofs shall utilize light colored, reflective	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		materials that meet the performance standards developed by the Energy Star Labeled Roof Program, as well as the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standards 90.1 and 90.2 on energy efficient buildings. This condition shall be verified by the County of San Bernardino Building and Safety Division prior to issuance of building permits.	
	Cumulative Impacts		
	5.4-5 *Build-out of the Moon Camp development, together with cumulative projects, may alter the nature and appearance of the area and contribute to the loss of undeveloped areas. Analysis has concluded that no significant impacts beyond the analysis contained in the County of San Bernardino General Plan and General Plan EIR are anticipated.*	5.4-5 No mitigation measures are recommended.	
5.5	**TRAFFIC AND CIRCULATION**		
	Existing Conditions with Project Traffic Analysis		
	5.5-1 *The intersection of Stanfield Cutoff and Big Bear Boulevard currently operates above 100 percent utilization in the peak month weekday evening peak hour. Although the Project does not generate significant traffic volumes, it would contribute to the intersection utilization at the weekday evening peak hour. Pro-rata share payment for intersection improvements to the intersection would reduce project affects to less than significant levels.*	5.5-1 For existing traffic conditions, the intersection of Stanfield Cutoff and Big Bear Boulevard currently requires the eastbound right turn lane to be converted to an eastbound through lane, through the intersection. The eastbound right turn lane is restricted to an eastbound through lane, and involves roadway widening. The project's pro rata share of these off-site road improvements is estimated to be $17,748.	Following implementation of recommended mitigation measures, Traffic and Circulation impacts would be reduced to a less than significant level.
	Year 2006 Traffic Analysis		
	5.5-2 *Project implementation, with year 2006 traffic conditions, would result in an increase in traffic volumes. Analysis has concluded that implementation of recommended mitigation measures would reduce impacts to the intersection of Stanfield Cutoff and Big Bear Boulevard to a less than significant level.*	5.5-2 Refer to Mitigation Measure 5.5-1. No additional mitigation measures are recommended.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	Year 2025 Traffic Analysis		
	5.5-3 *Project implementation, with year 2025 traffic conditions, would result in an increase in traffic volumes. Analysis has concluded that implementation of recommended mitigation measures would reduce impacts to the intersection of Stanfield Cutoff/Big Bear Boulevard and Stanfield Cutoff/North Shore Drive to a less than significant level.*	5.5-3 For future traffic conditions, the intersection of Stanfield Cutoff and North Shore Drive shall require a traffic signal. The project's pro rata share of the signal is $56,523.	
	Safety Hazards and Emergency Access		
	5.5-4 *Project implementation may increase hazards to vehicles, pedestrians and bicyclists due to the proposed project. Analysis has concluded that with implementation of the recommended mitigation measures, impacts would be less than significant.*	5.5-4a Parking shall be restricted on State Route 38. 5.5-4b A 150-foot eastbound left turn pocket shall be striped for traffic on North Shore Drive turning left into the project entry locations. 5.5-4c For future traffic conditions, intersection geometrics as recommended in Table 1b of the Kunzman Associates June 2003 *Traffic Analysis* report, shall be implemented. 5.5-4d All streets internal to the project shall be constructed to full ultimate cross-sections. ~~as adjacent development occurs.~~ 5.5-4e A STOP sign shall be installed to control outbound traffic on all site access roadways onto North Shore Drive. 5.5-4f The County of San Bernardino shall periodically review traffic operations in the vicinity of the site once the project is constructed in order to assure that the traffic operations are satisfactory. 5.5-4g Landscape plantings and signs shall be limited to 36 inches in height within 25 feet of project driveways to assure good visibility.	
5.6	**AIR QUALITY**		
	Short-Term Air Quality Impacts		
	5.6-1 *Significant short-term air quality impacts would occur during site*	5.6-1 In accordance with the County Development Code and SCAQMD	The following air quality impacts would remain

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	preparation and project construction. These impacts are considered significant before and after mitigation for ROG and NOx emissions from construction equipment exhaust. Impacts would be less than significant for other pollutants. (Mitigation in this instance refers to applicable County Development Code Sections and SCAQMD Rules.)	Rules, the Project Applicant shall incorporate the following measures during the construction phase of the Project to the satisfaction of the SCAQMD and County of San Bernardino. Compliance with this measure is subject to periodic field inspections by the SCAQMD and County of San Bernardino. Grading: Apply non-toxic soil stabilizers according to manufacturer's specifications to all inactive construction areas (previously graded for ten days or more); ▪ Replace ground cover in disturbed areas as quickly as possible; ▪ Enclose, cover, water two times daily or apply non-toxic soil binders in accordance to manufacturer's specifications to exposed piles (i.e., gravel, sand, dirt) with 5% or greater silt content; ▪ Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph; and ▪ All trucks hauling dirt, sand, soil, or other loose materials shall be covered and shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer). Paved Roads: ▪ Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads.	significant and unavoidable following mitigation: ▪ ROG and NOx from construction activities; ▪ Project Operations: Exceedance of State and/or Federal emission levels (ROG, CO and PM10) from project operations; and ▪ Project implemen-tation would result in a significant un-avoidable impact with respect to consistency with the AQMP. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with Section 15093 of CEQA.
	Long-Term Operational Impacts		
5.6-2	*The project would result in an overall increase in the local and regional pollutant load due to direct impacts from vehicle emissions and indirect impacts from electricity and natural gas consumption. Combined mobile and area source emissions would exceed SCAQMD thresholds for ROG, CO and*	5.6-2 To the extent feasible, the project shall incorporate the installation of EPA-certified wood burning stoves or fireplaces. If this is not feasible, then the installation of a ceramic coating on the honeycomb inside a catalytic combustor shall be investigated as a feasible alternative. Alternatively, the	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	PM_{10}. These exceedances are considered significant and cannot be mitigated to a less than significant level.	use of natural gas fireplaces may be used as a feasible alternative.	
	Consistency with Air Quality Management Plan		
	5.6-3 *The project would not conflict with the Air Quality Management Plan (AQMP). Analysis has concluded that the proposed project is consistent with the AQMP criteria.*	5.6-3 No mitigation measures are recommended.	
	Cumulative Impacts		
	5.6-4 *Cumulative impacts to regional air quality resulting from development of the proposed Project would be less than significant.*	5.6-4 No mitigation measures are recommended.	
5.7	**NOISE**		
	Short-Term Construction Noise and Vibration Impacts		
	5.7-1 *Grading and construction within the Project area would result in temporary noise and/or vibration impacts to nearby noise sensitive receptors. Analysis has concluded that construction noise and vibration impacts would be less than significant following compliance with the County requirements.*	5.7-1a Construction activities shall be limited to the hours of 7:00 a.m. ~~and~~ to 7:00 p.m. Monday to Saturday and prohibited on Sundays and Federal Holidays. 5.7-1b All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the County Engineer. 5.7-1c Stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receptors, to the satisfaction of the County Engineer. 5.7-1d Stockpiling and staging areas shall be located as far as practical from noise sensitive receptors during construction activities, to the satisfaction of the County Engineer.	No unavoidable significant impacts related to noise have been identified following implementation of recommended mitigation measures and compliance with applicable requirements set forth by the County of San Bernardino and the Big Bear Municipal Water District.
	Long-Term Noise Impacts		
	5.7-2 *Implementation of the Moon Camp Project would generate additional vehicular travel on the surrounding roadway network, thereby resulting in noise level increases. Analysis has concluded that long-term noise impacts would be less than significant for all analyzed roadway segments in*	5.7-2 No mitigation measures are recommended.	

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	Year 2006 and Year 2025 traffic scenarios. No mitigation measures are recommended.		
	Stationary Noise		
5.7-3	*Implementation of the Moon Camp project would result in on-site noise associated with residential and parking lot activities and boat loading/unloading activities at the marina. Analysis has concluded that stationary source impacts would be reduced to less than significant levels with adherence to the County of San Bernardino General Plan policies relating to noise level standards and recommended mitigation measures.*	5.7-3 No mitigation measures are recommended.	
	Watercraft Noise		
5.7-4	*Implementation of the Moon Camp project would result in increased watercraft activities on Big Bear Lake. Analysis has concluded that watercraft noise impacts would be reduced to less than significant levels with adherence to Rules and Regulations established by the Big Bear Municipal Water District for Big Bear Lake.*	5.7-4 No mitigation measures are recommended.	
	Cumulative		
5.7-5	*Implementation of the Moon Camp Project, combined with cumulative projects, would increase the ambient noise levels in the site vicinity. Impact analysis and mitigation of impacts are determined on a project-by-project basis.*	5.7-5 No mitigation measures are recommended.	
5.8	**BIOLOGICAL RESOURCES**		
	Special Status Biological Resources		
5.8-1	*Project implementation would affect species identified as special status. Implementation of recommended mitigation measures would reduce impacts to a less than significant level to biological species, with the exception of the Bald Eagle. Impacts to the Bald Eagle are concluded as significant and unavoidable.*	5.8-1a ~~Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on listed special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall.~~	Significant and unavoidable impacts related Biological Resources have been identified for impacts to Bald Eagle populations. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		~~The location and extent of special status species populations shall be mapped and the size of the populations accurately documented.~~ ~~The project applicant shall pay compensation for the loss of special status botanical resources identified on the project site by the survey by funding the purchase and management of off-site habitat through contributions to a fund established by the California Wildlife Foundation on behalf of the CDFG. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development).~~ ~~If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the project applicant is responsible for the mitigation of a minimum of 11.8 acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the federally-listed Threatened ash-gray Indian paintbrush (i.e., would be required to fund the purchase of 35.4 acres of offsite habitat from the California Wildlife Foundation if the agreed mitigation ratio is 3:1).~~ Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on	accordance with section 15093 of CEQA. No additional significant impacts related to Biological Resources have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

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		special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented. Pebble plain habitat acreages will be recalculated following the survey using criteria established by the Habitat Management Guide for Pebble Plain Habitat on the National Forest System (2002). Should avoidance/retention on-site of the 4.91 acres of Pebble Plain habitat in permanent open space under a Conservation Easement Agreement not occur, the Project Applicant shall pay compensation for the loss of special status botanical resources identified on the project site during the survey by funding the purchase, establishment of a conservation easement, and management of off-site habitat within the conservation easement by an entity approved by the CDFG. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio of 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development). Prior to the initiation of clearing or grading activities on the project site, the conservation easement will be established, the management entity will be approved by the CDFG, and a non-wasting endowment will be established for the monitoring and management of the preservation site by the management entity in perpetuity. If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the Project Applicant is responsible for mitigating impacts to a minimum of 11.8-acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the Federally-listed Threatened ash-gray	

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		Indian paintbrush. As such, the applicant would be required to fund the purchase and maintenance of 35.4-acres of offsite pebble plain and open Jeffrey pine forest habitat that contains special status plant species, including Ash-gray Indian paintbrush and others known to occur on the site.	
		5.8-1b Trees identified on Exhibits 3 and 4 of the Bald Eagle Survey Report (Appendix E, see attached) as eagle perch locations shall be preserved in place upon project completion and shall not be removed under any circumstances. Any development that may occur within the project site and in the individual lots must avoid impacts to these trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.	
		5.8-1c Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed to identify all large trees (i.e., greater than 20-inches in diameter at 4.5 feet from the ground) within 600 feet from the high water line. Trees identified on the project site as having a diameter in excess of 20-inches at four feet from the ground within 600 feet of the shoreline shall be documented and tagged. Any development that may occur within the project site and in the individual lots must avoid impacts to tagged trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers	

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		and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.	
		5.8-1d Seven days prior to the onset of construction activities, a qualified biologist shall survey within the limits of project disturbance for the presence of any active raptor nests. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG. If nesting activity is present at any raptor nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for raptors in the region of the project site normally occurs from February 1 to June 30. To protect any nest site, the following restrictions on construction are required between February 1 and June 30 (or until nests are no longer active as determined by a qualified biologist): (1) clearing limits shall be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying shall not be allowed within 200 feet of any occupied nest. Any encroachment into the 300/200 foot buffer area around the known nest shall only be allowed if it is determined by a qualified biologist that the proposed activity shall not disturb the nest occupants. Construction during the nesting season can occur only at the sites if a qualified biologist has determined that fledglings have left the nest.	
		5.8-1e Vegetation removal, clearing, and grading on the project site shall be performed outside of the breeding and nesting season (between March and September) to minimize the effects of these activities on breeding activities of migratory birds and other species.	

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		5.8-1f The use of the boat dock for motorized boating shall be prohibited between the dates of December 1 and April 1. No motorized boats shall be allowed to launch or moor in the vicinity of the boat dock at any time during this period. This restriction shall be clearly displayed on signage at the entrance to the parking lot and on the boat dock visible from both land and water. This requirement shall also be published in the Homeowner's Association CC&Rs.	
		~~5.8-1g Exterior construction shall be prohibited between the dates of December 1 and April 1 (of each year). Significant impacts to pebble plain habitat can be mitigated to a less than significant level through off-site preservation. The project applicant shall pay compensation for the loss of special status botanical resources identified on the site, by the survey, by contributing to the funding of purchase and management of off-site habitat. The Applicant shall acquire habitat in the Big Bear Valley and dedicate to the CDFG or suitable conservation organization. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off site habitat shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development. An area containing no less than 2.1 acres of pebble plain habitat in an area located adjacent to other open space areas within the project vicinity shall be preserved in perpetuity. The preserved areas shall be protected from future development through a conservation easement or other appropriate mechanism.~~	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	Sensitive Natural Communities/Habitats		
	5.8-2 *The proposed Project would impact portions of the Project site that are habitat for referenced sensitive species. Implementation of recommended mitigation measures would reduce impacts to a less than significant level.*	5.8-2a Street lamps on the project site shall not exceed 20 feet in height, shall be fully shielded to focus light onto the street surface and shall avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights shall utilize low color temperature lighting (e.g., red or orange). 5.8-2b Outdoor lighting for proposed homes on the individual tentative tracts shall not exceed 1,000 lumens. Furthermore, residential outdoor lighting shall not exceed 20 feet in height and must be shielded and focused downward to avoid lighting spillover onto adjacent open space or properties. These restrictions on outdoor lighting of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This requirement shall also be published in the Homeowner's Association CC&Rs. 5.8-2c To limit the amount of human disturbance ~~to~~ on adjacent natural open space areas, signs shall be posted along the northeastern and eastern perimeter of the project site where the property boundary abuts open space~~ directing people to keep out of the adjacent natural open space areas and to keep dogs leashed in areas adjacent to natural open space areas. This requirement shall be published in the Homeowner Association CC&Rs~~ with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash at all times." In addition, a requirement stating that residents shall keep out of adjacent open space areas to the north with the exception of designated trails will be published in the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents.	

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		5.8-2d Prior to ~~the issuance of individual building permits, landscaping designs~~ recordation of the final map, a landscaping plan for the entire tract shall be prepared (inclusive of a plant palette) with native trees and plant species, and, shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review shall determine that no non-native or invasive plant species are to be used in the proposed landscaping. The biologist should suggest appropriate native plant substitutes. A note shall be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform with the overall approved tract map landscaping plan. A requirement shall be included stating that residents shall include a restriction of the use of tree and plant species to only native trees/plants approved per the overall tract map landscaping plan. the Homeowner Association CC&Rs shall also restrict (individual lot owners) to use only native tree and plant species approved per the overall tract map landscaping plan.	
		5.8-2e ~~Garages with automatic door openers shall be required. No exterior construction shall occur between December 1 and April 1, when bald eagles are present~~. Garages with automatic door openers shall be required. No exterior construction, grading or vegetation clearing shall be permitted between December 1 and April 1, which is the wintering period for bald eagles (i.e., the season when bald eagles are present in the Big Bear area).	
		Also refer to mitigation measures 5.8-1a to 5.8-1f.	
	Jurisdictional Waters		
	5.8-3 *Development of the proposed Project ~~does not have~~has the potential to impact jurisdictional waters. Analysis has concluded that potentially significant impacts would be reduced to a less than significant level~~impact~~*	5.8-3 ~~No mitigation measures are recommended.~~ Per the direction of the California Department of Fish and Game, all unavoidable impacts to State and Federal jurisdictional lakes, streams, and associated	

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	~~*would occur in this regard after regulatory compliance*~~ *with implementation of the recommended mitigation measures*	habitat shall be compensated for with the creation and/or restoration of in-kind habitat on-site and/or off-site at a minimum 3:1 replacement-to-impact ratio. Additional requirements may be required through the permitting process depending on the quality of habitat impacted, project design and other factors.	
	Wildlife Movement		
	5.8-4 *Project implementation may interfere with the movement of a native resident or migratory wildlife species. Analysis has concluded that impacts are less than significant.*	5.8-4 No mitigation measures are recommended.	
	Regional and Local Policies/Plans		
	5.8-5 *Project implementation would not conflict with adopted regional and/or local policies/plans pertaining to biological resources. Analysis has concluded that impacts are less than significant.*	5.8-5 No mitigation measures are recommended.	
	Cumulative		
	5.8-6 *Cumulative development in the Project area may impact the area's biological resources. Analysis has concluded that* ~~*with implementation of the specified mitigation and compliance with all applicable County, State and Federal regulations concerning biological resources, a less than significant impact would occur in this regard.*~~*project implementation incrementally adding to impacts on bald eagle habitat in the Big Bear Valley would result in a significant and unavoidable cumulative impact to the wintering bald eagle population on Big Bear Lake.*	5.8-6 No mitigation measures are recommended.	
5.9	**CULTURAL RESOURCES**		
	Archaeological/Historical Resources		
	5.9-1 *The proposed Project may cause a significant impact to unknown archaeological and/or historic resources visible on-site. Implementation of recommended mitigation measures would reduce impacts to a less than significant level.*	5.9-1 Project-related grading, grubbing, trenching, excavations, and/or other earth-moving activities in the project area shall be monitored by a qualified archaeologist. In the event that a material of potential cultural significance is uncovered during such activities on the project site, all	No significant impacts related to Cultural Resources have been identified following implementation of mitigation measures referenced in this Section.

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		earth-moving activities in the project area shall cease and the archeologist shall evaluate the quality and significance of the material. Earth-moving activities shall not continue in the area where a material of potential cultural significance is uncovered until resources have been completely removed by the archaeologist and recorded as appropriate.	
	Paleontological Resources		
	5.9-2 *The proposed Project may cause a significant impact to unknown paleontological resources on-site. Implementation of recommended mitigation measures would reduce impacts to a less than significant level.*	5.9-2a Grading shall be monitored during excavation in areas identified as likely to contain paleontologic resources by a qualified paleontological monitor. Monitoring shall be accomplished for any undisturbed subsurface older alluvium, which might be present in the subsurface. The monitor shall be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments which are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert grading equipment to allow for removal of abundant or large specimens.	
		5.9-2b Recovered specimens shall be prepared to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.	
		5.9-2c Identification and curation of specimens into a museum repository with permanent retrievable storage shall occur for paleontological resources.	
		5.9-2d A report of findings shall be prepared with an appended itemized inventory of specimens. The report shall include pertinent discussion of the significance of all recovered resources where appropriate. The report and inventory when submitted to the appropriate Lead Agency, shall signify completion of the program to mitigate impacts to paleontologic resources.	

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	Burial Sites		
	5.9-3 *The proposed Project may cause a significant impact to Native American burial sites which could occur on-site. Implementation of the specified mitigation measures would reduce impacts to a less than significant level.*	5.9-3 In the event human remains are discovered during grading/ construction activities, work shall cease in the immediate area of the discovery and the Project Applicant shall comply with the requirements and procedures set forth in Section 5097.98 of the Public Resources Code, including notification of the County Coroner, notification of the Native American Heritage Commission, and consultation with the individual identified by the Native American Heritage Commission to be the "most likely descendent."	
	Cumulative		
	5.9-4 *Cumulative development may adversely affect cultural resources in the north shore area. Resources are evaluated and mitigated on a project-by-project basis.*	5.9-4 No mitigation measures are recommended.	
5.10	**GEOLOGY AND SOILS**		
	Slope Stability		
	5.10-1 *Development of the proposed Project could result in slope failures. Implementation of the recommended mitigation measures and compliance with the County Development Code and Uniform Building Code would reduce impacts to less than significant levels.*	5.10-1 The stability of ~~S~~south facing cut slopes shall be analyzed as part of the design-level geotechnical investigation. ~~u~~Utilize~~ing~~ 2:1 buttressed slopes using on site native soil materials, or ~~by~~ constructing geotextile-reinforced soil buttresses ~~where~~for planned unstable cut slopes~~ are planned~~ are typical engineering designs for stabilizing slopes. Either of these methods, or other methods must be approved by the San Bernardino County Department of Building and Safety~~Geologist for slope reinforcement may be utilized~~.	No significant impacts related to Geology and Soils have been identified following implementation of mitigation measures and/or compliance with applicable standards, policies and/or County of San Bernardino Development Code and standards set forth in the Uniform Building Code.
	Soil Erosion		
	5.10-2 *Development of the proposed Project could result in accelerated soil erosion. Project compliance with the County Development Code, the Uniform Building Code and the recommended mitigation measures would reduce impacts to a less than significant level.*	5.10-2a Due to the potential for erosion associated with younger alluvial deposits within the two major on-site stream channels, increased surface drainage quantities associated with development on-site shall be directed away from the stream channels.	

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		5.10-2b Prior to the issuance of Grading Permits, the Project Applicant shall prepare a Soil Erosion and Sedimentation Plan for submittal and approval by the County Building and Safety Department.	
	Ground Shaking		
	5.10-3 *Development of the proposed Project may increase the number of people/structures exposed to effects associated with seismically induced ground shaking. Implementation of the recommended mitigation measures and compliance with the County Development Code and the Uniform Building Code would reduce potential impacts to less than significant.*	5.10-3 Engineering design for all structures and roadways shall be based on the 2001 California Uniform Building Code. Construction plans shall be in accordance with seismic design standards set forth by the County's Development Code and Uniform Building Code.	
	Seiche		
	5.10-4 *Development of the proposed Project may expose people/structures to seiching as a result of significant ground motion related to an earthquake. Project compliance with recommended mitigation measures would reduce impacts to less than significant levels.*	5.10-4 Residential structures shall be located in areas which provide a minimum of five feet of freeboard above the high water line for any structures.	
	Expansive Soils		
	5.10-5 *Development of the proposed Project may create substantial risks to life property as a result of expansive soils. Implementation of the recommended mitigation measure would reduce impacts to less than significant levels.*	5.10-5 Prior to grading permit issuance, ~~geologic analysis/studies shall be required including 1)~~ a quantitative geotechnical analysis and~~of liquefaction, 2) a~~ design-level geotechnical engineering report shall be required and submitted to the County of San Bernardino Department of Building and Safety for their approval. ~~and 3) a design level engineering geology report.~~	
	Cumulative Impacts		
	5.10-6 *The proposed Project, combined with future development, may result in increased short-term impacts such as erosion and sedimentation, and long-term seismic impacts within the area. Mitigation is incorporated on a project-by-project basis to reduce impacts to a less than significant level in areas deemed suitable for development.*	5.10-6 No mitigation measures are recommended.	

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5.11	**HYDROLOGY AND DRAINAGE**		
	Drainage and Runoff		
	5.11-1 *The proposed Project could significantly alter drainage patterns which could result in increased erosion potential and runoff. Impacts are concluded as less than significant with implementation of the Project design features (i.e., the provision of adequate outlet structures, storm drains to contain flows and proper bluff drainage).*	5.11-1 The proposed cross culverts shall be sized for 100-year burn and bulking flow rates. The burn and bulking method would increase the runoff from the natural areas. The method provided in the Los Angeles County Hydrology Manual is recommended. In addition, the cross culverts shall all be designed with headwalls to prevent CMP crushing, and shall be maintained adequately.	Due to inconclusive testing of potential overdraft conditions for the ground water basin associated with the North Shore Hydrologic Subunit, project and cumulative impacts are concluded to be significant and unavoidable. If the County of San Bernardino approves the project, the County shall be required to adopt findings in accordance with Section 15091 of the CEQA Guidelines and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the CEQA Guidelines. No additional significant impacts related to hydrology and water quality have been identified following implementation of the recommended mitigation measures and/or through regulatory compliance.
	Groundwater		
	5.11-2 *The proposed project may result in groundwater overdraft conditions. Although mitigation measures requiring further testing are referenced, based upon the evidence presented to date, it is concluded that groundwater overdraft is a significant adverse impact and until additional technical review is conducted, the project would result in an unavoidable adverse impact.*	~~5.11-2 Based upon the technical analysis presented, a potential groundwater overdraft condition would occur and no additional mitigation measures have been identified.~~ 5.11-2a Within three months of project approval, the Project Applicant shall submit a plan for a detailed geohydrologic investigation. The plan must present the possible sources of groundwater selected for the project and the methodology proposed to investigate those sources. If the on-site wells are to be utilized to serve this project, it must be determined if either could draw water from Big Bear Lake. The plan must be prepared by a California Registered Geologist. 5.11-2b Within six months of plan approval, the Project Applicant shall submit the results of the geohydrologic investigation. The report must be prepared by a California Registered Geologist. 5.11-2c Concurrently or within three months of approval by the geohydrologic report, the Project Applicant shall submit a groundwater monitoring plan in accordance with San Bernardino County's "Guidelines for Preparation of a Groundwater Monitoring Plan." The plan must be prepared by a California Registered Geologist.	

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	Water Quality – Construction		
	5.11-3 *Grading, excavation and construction activities associated with the proposed Project could impact water quality due to sheet erosion of exposed soils and subsequent deposition of particles and pollutants in drainage areas. Impacts would be reduced to a less than significant level through regulatory compliance and with incorporation of the recommended mitigation.*	5.11-3 Prior to Grading Permit issuance and as part of the Project's compliance with the NPDES requirements, a Notice of Intent (NOI) shall be prepared and submitted to the Santa Ana Regional Water Quality Control Board providing notification and intent to comply with the State of California general permit. Also, a Storm Water Pollution Prevention Plan (SWPPP) shall be completed for the construction activities on-site. A copy of the SWPPP shall be available and implemented at the construction-site at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction-site to the "maximum extent practicable." At a minimum, the following shall be implemented from the *California Storm Water Best Management Practice Handbook - Construction Activity*: ▪ *CA 1 Dewatering Operations* – This operation requires the use of sediment controls to prevent or reduce the discharge of pollutants to storm water from dewatering operations. ▪ *CA 2 Paving Operations* – Prevent or reduce the runoff of pollutants from paving operations by proper storage of materials, protecting storm drain facilities during construction, and training employees. ▪ *CA 3 Structural Construction and Painting* – Keep site and area clean and orderly, use erosion control, use proper storage facilities, use safe products and train employees to prevent and reduce pollutant discharge to storm water facilities from construction and painting. ▪ *CA 10 Material Delivery and Storage* – Minimize the storage of hazardous materials on-site. If stored on-site, keep in designated areas, install secondary	

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		containment, conduct regular inspections and train employees. ▪ *CA 11 Material Use* – Prevent and reduce the discharge of pesticides, herbicides, fertilizers, detergents, plaster, petroleum products and other hazardous materials from entering the storm water. ▪ *CA 20 Solid Waste Management* - This BMP describes the requirements to properly design and maintain trash storage areas. The primary design feature requires the storage of trash in covered areas. ▪ *CA 21 Hazardous Waste Management* - This BMP describes the requirements to properly design and maintain waste areas. ▪ *CA 23 Concrete Waste Management* – Prevent and reduce pollutant discharge to storm water from concrete waste by performing on and off-site washouts in designated areas and training employees and consultants. ▪ *CA 24 Sanitary Septic Water Management* – Provide convenient, well-maintained facilities, and arrange regular service and disposal of sanitary waste. ▪ *CA 30 Vehicle and Equipment Cleaning* – Use off-site facilities or wash in designated areas to reduce pollutant discharge into the storm drain facilities. ▪ *CA 31 Vehicle and Equipment Fueling* – Use off-site facilities or designated areas with enclosures or coverings to reduce pollutant discharge into the storm drain facilities. ▪ *CA 32 Vehicle and Equipment Maintenance* – Use off-site facilities or designated areas with enclosing or coverings to reduce pollutant discharge into the storm	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		drain facilities. In addition, run a "dry site" to prevent pollution discharge into storm drains. ▪ *CA 40 Employee and Subcontractor Training* – Have a training session for employees and subcontractors to understand the need for implementation and usage of BMPs. ▪ *ESC 2 Preservation of Existing Vegetation* – Minimize the removal of existing trees and shrubs since they serve as erosion control. ▪ *ESC 10 Seeding and Planting* – Provide soil stability by planting and seeding grasses, trees, shrubs, vines, and ground cover. ▪ *ESC 11 Mulching* – Stabilize cleared or freshly seeded areas with mulch. ▪ *ESC 20 Geotextiles and Mats* – Natural or synthetics material can be used for soil stability. ▪ *ESC Dust Control* – Reduce wind erosion and dust generated by construction activities by using dust control measures. ▪ *ESC 23 Construction Road Stabilization* – All on-site vehicle transport routes shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust. ▪ *ESC 24* – Stabilized Construction Entrance – Stabilize the entrance pad to the construction area to reduce amount of sediment tracked off-site. ▪ *ESC 30 Earth Dikes* – Construct earth dikes of compacted soil to divert runoff or channel water to a desired location. ▪ *ESC 31 Temporary Drains and Swales* – Use temporary drains and swales to divert off-site runoff around the construction-site and stabilized areas and to direct it into sediment basins or traps.	

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		▪ *ESC 40 Outlet Protection* – Use rock or grouted rock at outlet pipes to prevent scouring of soil caused by high velocities. ▪ *ESC 41 Check Dams* – Use check dams to reduce velocities of concentrated flows, thereby reducing erosion and promoting sedimentation behind the dams. Check dams are small and placed across swales and drainage ditches. ▪ *ESC 50 Silt Fence* – Composed of filter fabric, these are entrenched, attached to support poles, and sometimes backed by wire fence support. Silt fences promote sedimentation behind the fence of sediment-laden water. ▪ *ESC 51 Straw Bale Barrier* – Place straw bales end to end in a level contour in a shallow trench and stake them in place. The bales detain runoff and promote sedimentation. ▪ *ESC 52 Sand Bag Barriers* – By stacking sand bags on a level contour, a barrier is created to detain sediment-laden water. The barrier promotes sedimentation. ▪ *ESC 53 Brush or Rock Filter* – Made of 0.75 to 3-inch diameter rocks placed on a level contour or composed of brush wrapped in filter cloth and staked to the toe of the slope provides a sediment trap. ▪ *ESC 54 Storm Drain Inlet Protection* – Devices that remove sediment from sediment laden storm water before entering the storm drain inlet or catch basin. ▪ *ESC 55 Sediment Trap* – A sediment trap is a small, excavated, or bermed area where runoff for small drainage areas can pass through allowing sediment to settle out.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	Water Quality – Long-Term		
	5.11-4 *Project development may result in long-term impacts to the quality of storm water and urban runoff, subsequently impacting water quality. Impacts would be reduced to less than significant levels with incorporation of the recommended mitigation measures along with State and County Development Code requirements.*	5.11-4a Prior to Grading Permit issuance, a Water Quality Management Plan shall be developed and shall include both Non-Structural and Source Control BMPs. The WQMP shall conform to the San Bernardino County Draft NPDES permit and WQMP standards. The following are the minimum required controls to be implemented as a part of the *Water Quality Management Plan (WQMP) for Urban Runoff.* ▪ *Education for Property Owners, Tenants and Occupations* – The Property Owners Association is required to provide awareness educational material, including information provided by San Bernardino County. The materials shall include a description of chemicals that should be limited to the property and proper disposal, including prohibition of hosing waste directly to gutters, catch basins, storm drains or the lake. ▪ *Activity Restrictions* – The developer shall prepare conditions, covenants and restriction of the protection of surface water quality. ▪ *Common Area Landscape Management* – For the common landscape areas on-going maintenance shall occur consistent with County Administrative Design Guidelines or city equivalent, plus fertilizer and pesticide usage consistent with the instructions contained on product labels and with regulation administered by the State Department of Pesticide Regulation or county equivalent. ▪ *Common Area Catch Basin Inspection* – Property Owners Associations shall have privately owned catch basins cleaned and maintained, as needed. These are intended to prevent sediment, garden waste, trash and other pollutants from entering the public streets and storm drain systems.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		▪ *Common Area Litter Control* – POAs shall be required to implement trash management and litter control procedures to minimize pollution to drainage waters. ▪ *Street Sweeping Private Streets and Parking Lots* – Streets and Parking lots shall be swept as needed, to prevent sediment, garden waste, trash and other pollutants from entering public streets and storm drain systems. The following controls from the *California Storm Water Best Management Practice Handbook - Municipal* shall be employed: ▪ *SC10 Housekeeping Practices* - This entails practices such as cleaning up spills, proper disposal of certain substances and wise application of chemicals. ▪ *SC32 Used Oil Recycling* - May apply to maintenance and security vehicles. ▪ *SC72 Vegetation Controls* – Vegetation control typically includes chemical (herbicide) application and mechanical methods. Chemical methods are discussed in SC10. Mechanical methods include leaving existing vegetation, cutting less frequently, hand cutting, planting low maintenance vegetation, collecting and properly disposing of clippings and cuttings, and educating employees and the public. ▪ *SC73 Storm Drain Flushing* - Although general storm drain gradients are sufficiently steep for self-cleansing, visual inspection may reveal a buildup of sediment and other pollutants at the inlets or outlets, in which case flushing may be advisable. 5.11-4b The Water Quality Management Plan (WQMP) shall include Structural or Treatment BMPs. The structural BMPs utilized shall focus on meeting potential TMDL requirements for noxious aquatic plants, nutrients,	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION

sedimentation and siltation. The structural BMPs shall conform to the San Bernardino County NPDES permit and the San Bernardino WQMP standards.

Consistent with the WQMP guidelines contained in the *Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements* for San Bernardino County, Structural BMPs shall be required for the proposed Project. They shall be sized to comply with one of the following numeric sizing criteria or be considered by the permittees to provide equivalent or better treatment.

Volume Based BMPs shall be designed to infiltrate or treat either:

- The volume of runoff produced from the 85th percentile 24-hour storm event, as determined from the local historical rainfall record; or
- The volume of the annual runoff produced by the 85th percentile 24-hours rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or
- The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practice Handbook – Industrial/Commercial (1993); or
- The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event.

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		OR Flow–based BMPs shall be designed to infiltrate or treat either: ▪ The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or ▪ The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or ▪ The maximum flow rate of runoff, as determined from the local historical rainfall record that achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two. The following are the minimum required controls to be implemented as a part of the *Water Quality Management Plan (WQMP) for Urban Runoff*. ▪ *Control of Impervious Runoff* – Surface runoff shall be directed to landscaped areas or pervious areas. ▪ *Common Area Efficient Irrigation* – Physical implementation of the landscape plan consistent with County Administrative Design Guidelines or city equivalent, which may include provision of water sensors, programmable irrigation timers, etc. ▪ *Common Area Runoff-Minimizing Landscape Design* – Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. ▪ *Catch Basin Stenciling* – "No Dumping – Flows to Lake" or equivalent effective phrase shall be stenciled on catch basins to alert the public as to the destination of pollutant discharging into storm drain.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		▪ *Debris Posts* – These shall be installed to prevent large floatable debris from entering the storm drains. They shall be placed upstream of the cross culverts. ▪ *Inlet Trash Racks* – These shall be installed where appropriate to reduce intake and transport through the storm drain system of large floatable debris. Trash racks shall be provided where drainage from open areas enters storm drain or cross culverts.	
		5.11-4c Storm water treatment under the NPDES Permit and the future TMDL requirements shall include the construction of treatment BMPs. Treatment BMPs appropriate for on-site use shall include infiltration trenches and basins, swales, inlet filtration, and/or water quality basins. All storm water runoff shall be treated before leaving the site to reduce pollutants in Big Bear Lake. <u>Infiltration Trenches and Basins</u> Infiltration Trenches and/or Basins shall be used on site to meet potential future TMDLs for noxious aquatic plants and nutrients. Infiltration trenches and basins treat storm water runoff through filtration. A typical infiltration trench is essentially an excavated trench, that is lined with filter fabric and backfilled with stones. Depth of the infiltration trench shall range from three to eight feet and shall be located in areas with permeable soils, and water table and bedrock depth situated well below the bottom of the trench. Trenches shall not be used to trap coarse sediments since large sediment would likely clog the trench. Grass buffers may be installed to capture sediment before it enters the trench to minimize clogging. Infiltration basins shall be used for drainage areas between five and 50 acres. Infiltration basins shall be either in-line or off-line, and may treat different volumes such as the water quality volume or the 2-year or 10-year storm.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		Swales The project shall implement either vegetative swales, enhanced vegetated swales utilizing check dams and wide depressions, a series of small detention facilities designed similarly to a dry detention basin, or a combination of these treatment methods into a treatment train (series of Structural BMPs). The Water Quality Management Plan shall address treatment for the Project to assure that runoff from the site is treated to the "maximum extent practicable". The swales shall be treated as water quality features and shall be maintained differently than grass areas. Specifically, pesticides, herbicide, and fertilizers, which may be used on the grass areas, shall not be used in the vegetation swales. Filtration Filtration shall be implemented as a treatment method and shall use drop-in infiltration devices or inline devices. Drop-infiltration devices at all curb inlets within the internal parking lots shall be implemented to provide potential pollutant removal. Existing examples of these filtration devices include the Drain Pac Storm Drain Inserts and Fossil Filters. These types of devices are efficient at removing oil and grease, debris, and suspended solids from treated waters. Some of these devices have also exhibited high efficiencies at removing heavy metals and other pollutants. Inline devices suggested for use onsite include the Continuous Deflection Separator (CDS® unit). Once the runoff has entered the storm drain, an in-line diversion would direct the treatment flow to a CDS® unit. The CDS® unit is a non-blocking, non-mechanical screening system, which would provide a second line of defense for solids removal. Adsorption materials can	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		be added within the CDS® unit to aid in the removal of oil and grease. The treated flow will exit the CDS® unit and continue downstream. To assure the efficiency of these filtration devices, monitoring shall be conducted. The use of street sweeps on the parking lots and streets shall aid in reducing the amounts of sediment and debris that flow through the devices. This will extend the effectiveness of the devices during a storm and will lower the frequency of required maintenance. The devices shall be checked and cleaned, if necessary, once a month during the rainy season, following any precipitation and at the end of the dry season prior to the first precipitation event of the rainy season. Consideration shall be given to using these filtration units in other areas besides the parking lot inlets. Another potential location is at the downstream end of the tributary pipes that feed the discharge point. Siting these units at a downstream point would allow for the treatment of a greater amount of runoff.	
	Cumulative Impacts		
5.11-5	*The proposed Project along with other future development may result in increased hydrology and drainage impacts in the area. Due to inconclusive of potential overdraft conditions, cumulative groundwater impacts are concluded to be significant and unavoidable. Other hydrology and drainage impacts are evaluated on a project-by-project basis in order to mitigate to a less than significant level.*	5.11-5 No mitigation measures are recommended.	

2.3 SUMMARY OF PROJECT ALTERNATIVES

In accordance with California Environmental Quality Act (CEQA) Guidelines Section 15126.6, Section 7.0 describes a range of reasonable alternatives to the proposed project which could feasibly attain the basic objectives of the proposed project, while evaluating the comparative merits of each alternative. The analysis focuses on alternatives capable of eliminating significant adverse environmental effects or

reducing them to less than significant levels, even if these alternatives would impede, to some degree, the attainment of the project objectives. Potential environmental impacts are compared to impacts from the proposed project. The following is a description of each of the alternatives evaluated in Section 7.0.

"NO PROJECT/NO DEVELOPMENT" ALTERNATIVE

Implementation of the "No Project/No Development" Alternative would retain the site in its current condition. None of the improvements proposed as part of the project and/or the existing designation would occur. The following discussion evaluates the potential environmental impacts associated with the No Project/No Development Alternative as compared to impacts from the proposed Project.

"NO PROJECT/EXISTING DESIGNATION" ALTERNATIVE

Implementation of the "No Project/Existing Designation" Alternative would be in accordance with the existing Official Land Use District Rural Living-40 (40-acre minimum lot size). This Alternative would result in 1.5 residential lots on the project site. This Alternative would be less intensive than the proposed Project. Approximately three persons (1.5 housing units x 2.15 persons/household) would be added to the permanent population of the Community of Fawnskin. It is further noted that in addition to a single-residential structure, other uses can be allowed including those in the "Additional Uses" section of the County Development Code, subject to a Conditional Use Permit. The following discussion evaluates the potential environmental impacts associated with the No Project/Existing Designation Alternative as compared to impacts from the proposed Project.

"REDUCED DENSITY, WITHOUT ROAD ALIGNMENT AND WITHOUT MARINA" ALTERNATIVE

For the Reduced Density, Without Road Realignment and Without Marina Alternative, development of 62 residential lots and associated infrastructure (as depicted in the project description) would occur on the north side of the existing State Route 38 alignment. State Route 38 would not be realigned and no residential development would occur to the south of State Route 38. The land area south of State Route 38, along the lakefront, would be retained in its current state. Approximately 133 persons (62 housing units x 2.15 persons/household) would be added to the permanent population of the Community of Fawnskin.

"REDUCED DENSITY, WITH PROJECT REDESIGN" ALTERNATIVE

For the Reduced Density, With Project Redesign Alternative, development of 66 residential lots and associated infrastructure would occur on project site. Implementation of this Alternative would include the realignment of State Route 38. Twenty-one (21) and 45 lots would be developed on the south and north sides of the realigned State Route 38, respectively. This Alternative would include a marina facility, with 72 boat slips. Approximately 142 persons (66 housing units x 2.15 persons/household) would be added to the permanent population of the Community of Fawnskin.

2.0 Executive Summary

2.0 EXECUTIVE SUMMARY

2.1 PROJECT ANALYSIS SUMMARY

The proposed Moon Camp Tentative Tract #16136 Residential Subdivision ("Moon Camp") encompasses approximately 62.43 acres along the northwest shore of Big Bear Lake, in the community of Fawnskin, County of San Bernardino. The Project site is located adjacent to the northwest shore of the Big Bear Lake, in the relatively undeveloped eastern portion of Fawnskin. The Project site is generally situated between Flicker Road to the north, Big Bear Lake to the south, Polique Canyon Road to the east, and Oriole Lane/Canyon Road to the west.

The Project proposes a 95-lot residential subdivision with lots ranging in size from 0.17 acres (7,292 square feet) to 2.11 acres. Lots would be sold individually and development of lots and construction of homes would be by custom design. The proposal is a Tentative Tract Map for 92 numbered and three lettered lots. The three lettered lots are identified as follows: (1) Lot "A" is a private street designed to provide access to the southernmost lots; (2) Lot "B" is a 1.4-acre strip of land that would remain between the relocation of State Route 38 and the private Street, Lot "A"; and (3) Lot "C" is a gated entrance to the Project, including a proposed boat dock, consisting of 100 boat slips, which would be available for use by residents of the tract and accessible by Lot "C".

The Project includes relocation of North Shore Drive, also referred to as State Route 38, to allow development of lakeshore lots. An approximately 2,498-foot segment of the roadway would be relocated. The maximum distance of relocation, as designed, is 207 feet to the north. The design includes a 76-foot road width, with 14-foot shoulder/bikeway access, resulting in a 104-foot right-of-way via a loop road that would include five separate cul-de-sac drives to access lakefront lots.

This EIR includes a comprehensive review of project affects, the significance of the affects and recommended mitigation measures. Section 5.0 of this EIR concludes that the proposed Project would generate impacts related to public services, utilities, aesthetics, traffic/circulation, air quality, noise, biological resources, cultural resources, geology/soils and hydrology/drainage. All impacts, with the exception of those identified for public services/utilities (ability to be served water), aesthetics, air quality, biological resources and hydrology (groundwater) can be mitigated to less than significant levels. The identified public services/utilities (ability to be served by water), aesthetic, air quality, biological resources and hydrology (groundwater) impacts require findings in accordance with Section 15091 of CEQA and a Statement of Overriding Considerations in accordance with Section 15093 of CEQA.

2.2 ENVIRONMENTAL ISSUES/MITIGATION SUMMARY

The following is a brief summary of the impacts, mitigation measures, and unavoidable significant impacts identified and analyzed in Section 5.0 of this EIR. Refer to the appropriate EIR Section for additional information.

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
5.1	**LAND USE AND RELEVANT PLANNING**		
	San Bernardino County General Plan		
	5.1-1 *The proposed Project conflicts with the land use plan, policies and regulations set forth in the San Bernardino County General Plan. Analysis has concluded that impacts would be less than significant with approval of a Land Use District Change and Circulation Element Amendment (Transportation/ Circulation Maps).*	5.1-1 No mitigation measures are recommended.	No unavoidable significant impacts related to Land Use and Relevant Planning have been identified following compliance with the San Bernardino County General Plan and Development Code policies and standards.
	San Bernardino County Development Code		
	5.1-2 *The proposed Project conflicts with the land use plan, policies and regulations of the San Bernardino County Development Code. Analysis has concluded that a less than significant impact would occur with approval of a Land Use District Change, Circulation Element Amendment and Conditional Use Permit.*	5.1-2 No mitigation measures are recommended.	
	Cumulative		
	5.1-3 *The proposed Project, combined with other future development, will increase the intensity of land uses in the area. Analysis has concluded that impacts are less than significant and no mitigation is required. Projects are evaluated on a project-by-project basis in accordance with the San Bernardino County General Plan and Development Code.*	5.1-3 No mitigation measures are recommended.	
5.2	**RECREATION**		
	Expansion and/or Construction of Recreational Facilities		
	5.2-1 *Implementation of the Moon Camp project involves the construction or expansion of recreational facilities which may have an adverse physical*	5.2-1 No mitigation measures are recommended.	No significant impacts related to Recreational facilities have been identified in this Section.

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	effect on the environment. Compliance with the Big Bear MWD standards and permit requirements would reduce impacts to a less than significant level.		
	Public Access		
	5.2-2 *Implementation of the Moon Camp project would ~~not~~ affect public access along the north shore of Big Bear Lake. Mitigation requiring dedication of an easement along the south side of North Shore Drive has been incorporated. ~~The Project site is Private Property. Affects on public access are concluded as less than significant.~~*	5.2-2 ~~No mitigation measures are recommended.~~ The proposed project shall be conditioned to incorporate a pedal path easement along the south side of North Shore Drive, prior to map recordation.	
	Cumulative		
	5.2-3 *Cumulative development may result in increased use of existing recreational areas/facilities, thereby creating the potential for physical deterioration. Additionally, cumulative development may include recreational facilities (i.e., marina) that have the potential to result in physical impacts on the environment. Mitigation measures necessary for reducing impacts are addressed on a project-by-project basis to reduce impacts to a less than significant level.*	5.2-3 No mitigation measures are recommended.	
5.3	**PUBLIC SERVICES AND UTILITIES**		
	Fire Protection		
	5.3-1 *Project implementation could result in significant physical impacts with respect to fire protection. Analysis has concluded that impacts would be less than significant with the recommended mitigation measures.*	5.3-1a The fire flow requirement shall be 1750 gpm @ 2 hours based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm @ 2 hours for homes greater than 4,800 square feet.	
		5.3-1b ~~Fire sprinklers for each residence shall be provided in lieu of additional manpower.~~ All residences less than 5,000 square feet shall be subject to the standard fire sprinkler requirement (NFPA 13D). Homes above 5,000 square feet shall be subject to the NFPA13R~~have a larger~~ sprinkler requirement ~~(FPA13R)~~.	
		5.3-1c A ~~f~~Fuels ~~modification program~~Management Plan, with specifications, shall be prepared and	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		subject to approval by the County of San Bernardino Fire Department and San Bernardino National Forest Service. The Fuels Management Plan shall implement the fire safety requirements of the FS1 Fire Safety Overlay District, including a 30-foot minimum setback requirement from the National Forest. The fuel modification zone shall be located entirely within the project's boundaries. ~~The 100 foot fuel modification requirement shall not terminate at a property line. The 100 foot fuel modification requirement shall extend beyond property lines. Where such fuel modification zone extends onto U.S. Forest Service land, an easement or permit shall be required to be obtained.~~ The minimum~~100 foot~~ fuel modification zone requirements may be greater in steeper areas (up to 300 ft.), as determined by the Fire ~~Agency~~ Department.	
		5.3-1d Cul-de-sac lengths shall be no longer than 350 feet.	
		5.3-1e A Homeowner's Association or a Special District shall be established to ~~assure~~ implement the Fuels Management Plan. The Fuels Management Plan shall specify any professional assistance, if necessary, to implement the action portion of the plan. The Plan shall determine if a Registered Professional Forrester is necessary for professional guidance to implement the Plan. ~~Long term vegetation maintenance. An annual vegetation maintenance program shall be included.~~ The HOA or Special District is to be responsible for fuel modification in common areas.	
		~~5.3-1f Fire resistance/drought tolerant landscaping shall be required and referenced in the Homeowner's Association or Special District Standards.~~	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	Police Protection		
	5.3-2 *Project implementation could result in significant physical impacts with respect to police protection. Analysis has concluded that a less than significant impact would occur.*	5.3-2 No mitigation measures are recommended.	
	Schools		
	5.3-3 *Project implementation could result in significant physical impacts to existing school facilities. Potential impacts to school facilities are concluded as less than significant following payment of school impact fees and compliance with all applicable requirements, codes, and ordinances.*	5.3-3 No mitigation measures are recommended.	
	Libraries		
	5.3-4 *Project implementation would increase the demand on library services. Analysis has concluded that that a less than significant impact would occur.*	5.3-4 No mitigation measures are recommended.	
	Wastewater		
	5.3-5 *Project implementation would generate additional wastewater beyond current conditions. Analysis has concluded that impacts would be less than significant with the recommended mitigation measures.*	5.3-5a Prior to issuance of building permits, the Project Applicant shall fund all on-site and off-site sewer improvements required to support development of the Project site. Such improvements shall be to the satisfaction of the BBARWA, and may include replacement of existing sewer lines rather than construction of parallel lines. 5.3-5b Prior to issuance of building permits, the Project Applicant shall provide evidence to the County of San Bernardino that the BBARWA has sufficient transmission and treatment plant capacity to accept sewage flows from the Project site. 5.3-5c The Project Applicant shall relocate the BBARWA 10" force main by installing new pipe (and/or bonding for the relocation) so that it is aligned within the south shoulder of the relocated State Route 38. The 10" force main shall be accessible for BBARWA to maintain and repair the sewer force main. The force main shall not pass through residential lots within the proposed tract.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		5.3-5d The Project Applicant shall install air release valves and vaults at high elevation points on the new force main to minimize odors. Air release valves shall be large enough to enclose 55-gallon drum carbon filters to control odors.	
	Water		
	5.3-6 *Project implementation would increase the demand for water beyond existing conditions. Analysis has concluded that due to the inability of water providers to confirm service to the project, impacts are concluded as significant and adverse. This conclusion is further supported by the potentially significant groundwater overdraft conditions cited in Section 5.11 of the EIR.*	5.3-6a ~~Prior to approval of building permits, a video inspection of water supply casings and screen shall be conducted in order to update~~ Values of production rates and pumping levels for on-site water supply wells shall be obtained through step-drawdown and constant rate pumping tests. Water samples shall be taken during the inspection for testing and analysis in accordance with standard requirements. 5.3-6b If either or both of the two existing on-site wells are utilized as a water source for the project, ~~T~~the Project Applicant shall equip the~~two existing on-site~~ wells to meet DWP and/or County Special Districts Department standards and dedicate these facilities and water rights to the appropriate water purveyor~~County of San Bernardino~~. Within the proposed tract, no individual private irrigation wells shall be permitted. 5.3-6c ~~If served by CSA 53-C through a contract with the City of Big Bear Lake Department of Water and Power, t~~ After a determination has been made regarding the water purveyor, the Project Applicant shall advance fair-share funds ~~or enter into a reimbursement agreement with the~~ to the appropriate water agency (CSA and/or DWP)~~(if required)~~ towards constructing a new reservoir and pipeline improvement at Cline-Miller Reservoir (with an estimated project cost at $481,100). These facilities would be dedicated to the appropriate water agency. 5.3-6d The following water conservation measures are the minimum measures that shall be complied with in conjunction with domestic water supply to the project. A Homeowners Association shall be	Due to the inability of water providers to confirm service to the project, project as well as cumulative impacts are concluded as significant and unavoidable. This conclusion is further supported by the significant and unavoidable conclusion cited in Section 5.11, *Hydrology and Drainage*, due to inconclusive testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit. If the County of San Bernardino approves the project, the County shall be required to adopt findings in accordance with Section 15091 of the CEQA Guidelines and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the CEQA Guidelines. No additional unavoidable significant impacts related to public services and utilities have been identified following implementation of the recommended mitigation measures and compliance with applicable County, service or utility provider requirements, County Codes and Ordinances.

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION

responsible for enforcing the water conservation measures. Additional measures may be imposed as a result of a contract for water supply between CSA 53-C and the City of Big Bear Lake DWP:

- Landscape shall not be irrigated between the hours of nine (9) a.m. and six (6) p.m.
- Residences, buildings and premises shall be limited to watering every other day.
- Landscape irrigation shall be limited to what is needed and shall not be excessive. Water from landscape irrigation shall not be allowed to run off into streets.
- Water shall not be allowed to leak from any waterline, faucet, or any other facility, either within or outside a private residence, business establishment or on private property. All such leaking waterlines, faucets, and other facilities shall be repaired immediately to prevent leakage.
- Sidewalks, paved driveways, and parkways shall not be washed off with hoses, except as required for sanitary purposes.
- Non-commercial washing of cars, and boats or any other vehicle shall only be done with an automatic shut-off nozzle on a hose, or with a bucket.
- New landscaping shall not exceed more than one-thousand square feet of turf on a parcel or lot or twenty-five percent of the available landscape area.
- A model landscaping and irrigation guide shall be prepared for the tract and required by homeowner association rules. The guide shall specify a plant palate that emphasizes native plants and cultivars that are suitable for the mountain climate. Plant materials shall be low water consuming and fire resistant. Irrigation shall emphasize drip and bubbler type emitters with limit aerial spray

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		irrigation methods. The guide shall be reviewed and approved by the Land Use Services Department.	
	Solid Waste		
5.3-7	*Development of the Project area would result in increased solid waste generation. Project compliance with the Integrated Waste Management Plan for the County of San Bernardino (currently being revised) would reduce the amount of solid waste which is ultimately disposed of at the Barstow Landfill and maintain potential impacts at a less than significant level.*	5.3-7 No mitigation measures are recommended.	
	Natural Gas		
5.3-8	*Project implementation would result in an increased demand for natural gas service beyond existing conditions and would require expansion of the existing gas system. Analysis has concluded that a less than significant impact would occur in this regard.*	5.3-8 No mitigation measures are recommended.	
	Electricity		
5.3-9	*Project implementation would result in an increased demand for electrical service beyond existing conditions and would require expansion of the existing electrical system. Analysis has concluded that impacts would be less than significant.*	5.3-9 No mitigation measures are recommended.	
	Cumulative Impacts		
5.3-10	*Cumulative development could result in an increased demand for public services and an increase in the consumption rates for public utilities, potentially requiring expansions of the existing utility systems. The inability of water providers to confirm service on a project level would also result in significant and unavoidable cumulative impacts. Analysis has concluded that cumulative development for the remaining service and utility affects are subject to standards and requirements of reviewing agencies and no additional mitigation is recommended.*	5.3-10 No mitigation measures are recommended.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
5.4	**AESTHETICS/LIGHT AND GLARE**		
	Short-Term Aesthetic/Light and Glare Impacts		
	5.4-1 *Construction of the proposed project would temporarily alter the visual appearance of the site and introduce new short-term sources of light and glare. Analysis has concluded that impacts would be reduced to less than significant levels with implementation of the recommended mitigation measures.*	5.4-1a Construction equipment staging areas shall be located away from existing residential uses. Appropriate screening (i.e., temporary fencing with opaque material) shall be used to buffer views of construction equipment and material, when feasible. Staging locations shall be indicated on project Grading Plans. 5.4-1b All construction-related lighting associated with the construction of new roadways, the realignment of State Route 38, and the installation of utilities shall be located and aimed away from adjacent residential areas. Lighting shall use the minimum wattage necessary to provide safety at the construction site. A construction safety lighting plan shall be submitted to the county for review concomitant with Grading Permit applications for the subdivision of the lots.	Significant and unavoidable impacts related to Aesthetics/Light and Glare have been identified for viewshed alterations involving existing residents to the north, east and west of the project site. Additionally, significant and unavoidable impacts have been identified for views from State Route 38, a scenic highway, to the south and from the south shore of Big Bear Lake. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA.
	Long-Term Aesthetic Impacts		
	5.4-2 *Implementation of the Moon Camp project would adversely impact scenic resources, scenic vistas and the visual character of the site and its surroundings. Analysis has concluded that a significant and unavoidable impact to the visual character and viewshed from the project site and surrounding areas would occur which cannot be mitigated to a less than significant level.*	5.4-2a Roof pitches shall not exceed 9/12 and no higher than two-story for any portion of the structure footprint for lots 62-92. 5.4-2b All homes shall provide a two-car garage with automatic garage doors. 5.4-2c A view envelope for each property shall be established by creating a line starting at 6 feet at each side lot line and moving up at a 30 degree angle until both lines meet at the middle of the property. The area located under these lines is the view envelope. Structures shall not protrude outside the view envelope. The view envelope orients the building ridgeline parallel to the view corridors on narrower lots providing views for residents located behind the property.	No additional significant impacts related to Aesthetic/Light and Glare have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		5.4-2d New development shall be subordinate to the natural setting and minimize reflective surfaces. Building materials including siding and roof materials shall be selected to blend in hue and brightness with the surroundings. Colors shall be earth tones, shades of grays, tans, browns, greens, pale yellows, and shall be consistent with the mountain character of the area.	
		5.4-2e Outside parking/storage areas associated with the boat dock activities shall be completely screened from view by the placement of landscaping and plantings which are compatible with the local environment and, where practicable, are capable of surviving with a minimum of maintenance and supplemental water.	
		5.4-2f Construction plans for each individual lot shall include the identification and placement of vegetation with the mature height of trees listed. Landscaping and plantings should not obstruct significant views, within or outside of the project, either when installed or when they reach mature growth. The removal of existing vegetation shall not be required to create views.	
		5.4-2g A Note shall be placed on the Composite Development Plan stating that during construction plans review and prior to issuance of building permits for each lot, the building inspector shall refer to the Mitigation Monitoring and Compliance Program regarding these aesthetic impact mitigation measures. The building inspector shall coordinate with the Advance Planning Division the review and approval of building plans in relation to these aesthetic impact mitigation measures, prior to approval and issuance of building permits.	
	Long-Term Scenic Highway Impacts		
	5.4-3 *Implementation of the Moon Camp project would impact views of Big Bear Lake, the distant mountain ranges to the south and adjacent forest areas from North Shore Drive*	5.4-3a Any entry sign for the development shall be a monument style sign compatible with the mountain character, preferably, rock or rock-appearance.	

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	(State Route 38) which is a County and Federally recognized Scenic Highway/Byway. Analysis has concluded that significant and unavoidable impacts would occur as a result of project development.	5.4-3b Prior to recordation of the tract map (and/or any ground disturbance, whichever occurs first), landscaping plans for lettered lots B and C shall be submitted to and approved by the San Bernardino County Planning Department.	
	Long-Term Light and Glare Impacts		
	5.4-4 *The proposed Moon Camp project would introduce additional light and glare on-site which may affect the surrounding residents. Analysis has concluded that potential impacts would be reduced to less than significant levels with implementation of the recommended mitigation measures.*	5.4-4a All exterior lighting shall be designed and located as to avoid intrusive effects on adjacent residential properties and undeveloped areas adjacent to the project site. Low-intensity street lighting and low-intensity exterior lighting shall be used throughout the development to the extent feasible. Lighting fixtures shall use shielding, if necessary to prevent spill lighting on adjacent off-site uses. 5.4-4b Lighting used for various components of the development plan shall be reviewed for light intensity levels, fixture height, fixture location and design by an independent engineer, and reviewed and approved by the County Building and Safety Division. 5.4-4c The project shall use minimally reflective glass. All other materials used on exterior buildings and structures shall be selected with attention to minimizing reflective glare. 5.4-4d Vegetated buffers shall be used along State Route 38 to reduce light intrusion on residential development and on forested areas located adjacent to the project site. 5.4-4e Mitigation Measures 5.4-4a through 5.4-4d shall be included within the Conditions, Covenants and Restrictions (CC&Rs) of the Home Owner's Association (HOA). 5.4-4f All outdoor light fixtures shall be cutoff luminaries and shall only use high- or low-pressure sodium lamps. 5.4-4g The Project Applicant/Developer shall install light colored, reflective roof products. Such roofs shall utilize light colored, reflective	

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		materials that meet the performance standards developed by the Energy Star Labeled Roof Program, as well as the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standards 90.1 and 90.2 on energy efficient buildings. This condition shall be verified by the County of San Bernardino Building and Safety Division prior to issuance of building permits.	
	Cumulative Impacts		
	5.4-5 *Build-out of the Moon Camp development, together with cumulative projects, may alter the nature and appearance of the area and contribute to the loss of undeveloped areas. Analysis has concluded that no significant impacts beyond the analysis contained in the County of San Bernardino General Plan and General Plan EIR are anticipated.*	5.4-5 No mitigation measures are recommended.	
5.5	**TRAFFIC AND CIRCULATION**		
	Existing Conditions with Project Traffic Analysis		
	5.5-1 *The intersection of Stanfield Cutoff and Big Bear Boulevard currently operates above 100 percent utilization in the peak month weekday evening peak hour. Although the Project does not generate significant traffic volumes, it would contribute to the intersection utilization at the weekday evening peak hour. Pro-rata share payment for intersection improvements to the intersection would reduce project affects to less than significant levels.*	5.5-1 For existing traffic conditions, the intersection of Stanfield Cutoff and Big Bear Boulevard currently requires the eastbound right turn lane to be converted to an eastbound through lane, through the intersection. The eastbound right turn lane is restricted to an eastbound through lane, and involves roadway widening. The project's pro rata share of these off-site road improvements is estimated to be $17,748.	Following implementation of recommended mitigation measures, Traffic and Circulation impacts would be reduced to a less than significant level.
	Year 2006 Traffic Analysis		
	5.5-2 *Project implementation, with year 2006 traffic conditions, would result in an increase in traffic volumes. Analysis has concluded that implementation of recommended mitigation measures would reduce impacts to the intersection of Stanfield Cutoff and Big Bear Boulevard to a less than significant level.*	5.5-2 Refer to Mitigation Measure 5.5-1. No additional mitigation measures are recommended.	

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	Year 2025 Traffic Analysis		
	5.5-3 *Project implementation, with year 2025 traffic conditions, would result in an increase in traffic volumes. Analysis has concluded that implementation of recommended mitigation measures would reduce impacts to the intersection of Stanfield Cutoff/Big Bear Boulevard and Stanfield Cutoff/North Shore Drive to a less than significant level.*	5.5-3 For future traffic conditions, the intersection of Stanfield Cutoff and North Shore Drive shall require a traffic signal. The project's pro rata share of the signal is $56,523.	
	Safety Hazards and Emergency Access		
	5.5-4 *Project implementation may increase hazards to vehicles, pedestrians and bicyclists due to the proposed project. Analysis has concluded that with implementation of the recommended mitigation measures, impacts would be less than significant.*	5.5-4a Parking shall be restricted on State Route 38. 5.5-4b A 150-foot eastbound left turn pocket shall be striped for traffic on North Shore Drive turning left into the project entry locations. 5.5-4c For future traffic conditions, intersection geometrics as recommended in Table 1b of the Kunzman Associates June 2003 *Traffic Analysis* report, shall be implemented. 5.5-4d All streets internal to the project shall be constructed to full ultimate cross-sections. ~~as adjacent development occurs.~~ 5.5-4e A STOP sign shall be installed to control outbound traffic on all site access roadways onto North Shore Drive. 5.5-4f The County of San Bernardino shall periodically review traffic operations in the vicinity of the site once the project is constructed in order to assure that the traffic operations are satisfactory. 5.5-4g Landscape plantings and signs shall be limited to 36 inches in height within 25 feet of project driveways to assure good visibility.	
5.6	**AIR QUALITY**		
	Short-Term Air Quality Impacts		
	5.6-1 *Significant short-term air quality impacts would occur during site*	5.6-1 In accordance with the County Development Code and SCAQMD	The following air quality impacts would remain

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	preparation and project construction. These impacts are considered significant before and after mitigation for ROG and NOx emissions from construction equipment exhaust. Impacts would be less than significant for other pollutants. (Mitigation in this instance refers to applicable County Development Code Sections and SCAQMD Rules.)	Rules, the Project Applicant shall incorporate the following measures during the construction phase of the Project to the satisfaction of the SCAQMD and County of San Bernardino. Compliance with this measure is subject to periodic field inspections by the SCAQMD and County of San Bernardino. Grading: Apply non-toxic soil stabilizers according to manufacturer's specifications to all inactive construction areas (previously graded for ten days or more); ▪ Replace ground cover in disturbed areas as quickly as possible; ▪ Enclose, cover, water two times daily or apply non-toxic soil binders in accordance to manufacturer's specifications to exposed piles (i.e., gravel, sand, dirt) with 5% or greater silt content; ▪ Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph; and ▪ All trucks hauling dirt, sand, soil, or other loose materials shall be covered and shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer). Paved Roads: ▪ Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads.	significant and unavoidable following mitigation: ▪ ROG and NOx from construction activities; ▪ Project Operations: Exceedance of State and/or Federal emission levels (ROG, CO and PM10) from project operations; and ▪ Project implemen-tation would result in a significant un-avoidable impact with respect to consistency with the AQMP. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with Section 15093 of CEQA.
	Long-Term Operational Impacts		
5.6-2	*The project would result in an overall increase in the local and regional pollutant load due to direct impacts from vehicle emissions and indirect impacts from electricity and natural gas consumption. Combined mobile and area source emissions would exceed SCAQMD thresholds for ROG, CO and*	5.6-2 To the extent feasible, the project shall incorporate the installation of EPA-certified wood burning stoves or fireplaces. If this is not feasible, then the installation of a ceramic coating on the honeycomb inside a catalytic combustor shall be investigated as a feasible alternative. Alternatively, the	

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	PM_{10}. These exceedances are considered significant and cannot be mitigated to a less than significant level.	use of natural gas fireplaces may be used as a feasible alternative.	
	Consistency with Air Quality Management Plan		
	5.6-3 *The project would not conflict with the Air Quality Management Plan (AQMP). Analysis has concluded that the proposed project is consistent with the AQMP criteria.*	5.6-3 No mitigation measures are recommended.	
	Cumulative Impacts		
	5.6-4 *Cumulative impacts to regional air quality resulting from development of the proposed Project would be less than significant.*	5.6-4 No mitigation measures are recommended.	
5.7	**NOISE**		
	Short-Term Construction Noise and Vibration Impacts		
	5.7-1 *Grading and construction within the Project area would result in temporary noise and/or vibration impacts to nearby noise sensitive receptors. Analysis has concluded that construction noise and vibration impacts would be less than significant following compliance with the County requirements.*	5.7-1a Construction activities shall be limited to the hours of 7:00 a.m. ~~and~~ to 7:00 p.m. Monday to Saturday and prohibited on Sundays and Federal Holidays. 5.7-1b All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the County Engineer. 5.7-1c Stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receptors, to the satisfaction of the County Engineer. 5.7-1d Stockpiling and staging areas shall be located as far as practical from noise sensitive receptors during construction activities, to the satisfaction of the County Engineer.	No unavoidable significant impacts related to noise have been identified following implementation of recommended mitigation measures and compliance with applicable requirements set forth by the County of San Bernardino and the Big Bear Municipal Water District.
	Long-Term Noise Impacts		
	5.7-2 *Implementation of the Moon Camp Project would generate additional vehicular travel on the surrounding roadway network, thereby resulting in noise level increases. Analysis has concluded that long-term noise impacts would be less than significant for all analyzed roadway segments in*	5.7-2 No mitigation measures are recommended.	

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	Year 2006 and Year 2025 traffic scenarios. No mitigation measures are recommended.		
	Stationary Noise		
5.7-3	*Implementation of the Moon Camp project would result in on-site noise associated with residential and parking lot activities and boat loading/unloading activities at the marina. Analysis has concluded that stationary source impacts would be reduced to less than significant levels with adherence to the County of San Bernardino General Plan policies relating to noise level standards and recommended mitigation measures.*	5.7-3 No mitigation measures are recommended.	
	Watercraft Noise		
5.7-4	*Implementation of the Moon Camp project would result in increased watercraft activities on Big Bear Lake. Analysis has concluded that watercraft noise impacts would be reduced to less than significant levels with adherence to Rules and Regulations established by the Big Bear Municipal Water District for Big Bear Lake.*	5.7-4 No mitigation measures are recommended.	
	Cumulative		
5.7-5	*Implementation of the Moon Camp Project, combined with cumulative projects, would increase the ambient noise levels in the site vicinity. Impact analysis and mitigation of impacts are determined on a project-by-project basis.*	5.7-5 No mitigation measures are recommended.	
5.8	**BIOLOGICAL RESOURCES**		
	Special Status Biological Resources		
5.8-1	*Project implementation would affect species identified as special status. Implementation of recommended mitigation measures would reduce impacts to a less than significant level to biological species, with the exception of the Bald Eagle. Impacts to the Bald Eagle are concluded as significant and unavoidable.*	5.8-1a ~~Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on listed special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall.~~	Significant and unavoidable impacts related Biological Resources have been identified for impacts to Bald Eagle populations. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		~~The location and extent of special status species populations shall be mapped and the size of the populations accurately documented.~~ ~~The project applicant shall pay compensation for the loss of special status botanical resources identified on the project site by the survey by funding the purchase and management of off-site habitat through contributions to a fund established by the California Wildlife Foundation on behalf of the CDFG. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development).~~ ~~If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the project applicant is responsible for the mitigation of a minimum of 11.8 acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the federally-listed Threatened ash-gray Indian paintbrush (i.e., would be required to fund the purchase of 35.4 acres of offsite habitat from the California Wildlife Foundation if the agreed mitigation ratio is 3:1).~~ Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on	accordance with section 15093 of CEQA. No additional significant impacts related to Biological Resources have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

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		special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented. Pebble plain habitat acreages will be recalculated following the survey using criteria established by the Habitat Management Guide for Pebble Plain Habitat on the National Forest System (2002). Should avoidance/retention on-site of the 4.91 acres of Pebble Plain habitat in permanent open space under a Conservation Easement Agreement not occur, the Project Applicant shall pay compensation for the loss of special status botanical resources identified on the project site during the survey by funding the purchase, establishment of a conservation easement, and management of off-site habitat within the conservation easement by an entity approved by the CDFG. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio of 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development). Prior to the initiation of clearing or grading activities on the project site, the conservation easement will be established, the management entity will be approved by the CDFG, and a non-wasting endowment will be established for the monitoring and management of the preservation site by the management entity in perpetuity. If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the Project Applicant is responsible for mitigating impacts to a minimum of 11.8-acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the Federally-listed Threatened ash-gray	

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		Indian paintbrush. As such, the applicant would be required to fund the purchase and maintenance of 35.4-acres of offsite pebble plain and open Jeffrey pine forest habitat that contains special status plant species, including Ash-gray Indian paintbrush and others known to occur on the site.	
		5.8-1b Trees identified on Exhibits 3 and 4 of the Bald Eagle Survey Report (Appendix E, see attached) as eagle perch locations shall be preserved in place upon project completion and shall not be removed under any circumstances. Any development that may occur within the project site and in the individual lots must avoid impacts to these trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.	
		5.8-1c Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed to identify all large trees (i.e., greater than 20-inches in diameter at 4.5 feet from the ground) within 600 feet from the high water line. Trees identified on the project site as having a diameter in excess of 20-inches at four feet from the ground within 600 feet of the shoreline shall be documented and tagged. Any development that may occur within the project site and in the individual lots must avoid impacts to tagged trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers	

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		and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.	
		5.8-1d Seven days prior to the onset of construction activities, a qualified biologist shall survey within the limits of project disturbance for the presence of any active raptor nests. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG. If nesting activity is present at any raptor nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for raptors in the region of the project site normally occurs from February 1 to June 30. To protect any nest site, the following restrictions on construction are required between February 1 and June 30 (or until nests are no longer active as determined by a qualified biologist): (1) clearing limits shall be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying shall not be allowed within 200 feet of any occupied nest. Any encroachment into the 300/200 foot buffer area around the known nest shall only be allowed if it is determined by a qualified biologist that the proposed activity shall not disturb the nest occupants. Construction during the nesting season can occur only at the sites if a qualified biologist has determined that fledglings have left the nest.	
		5.8-1e Vegetation removal, clearing, and grading on the project site shall be performed outside of the breeding and nesting season (between March and September) to minimize the effects of these activities on breeding activities of migratory birds and other species.	

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		5.8-1f The use of the boat dock for motorized boating shall be prohibited between the dates of December 1 and April 1. No motorized boats shall be allowed to launch or moor in the vicinity of the boat dock at any time during this period. This restriction shall be clearly displayed on signage at the entrance to the parking lot and on the boat dock visible from both land and water. This requirement shall also be published in the Homeowner's Association CC&Rs.	
		~~5.8-1g Exterior construction shall be prohibited between the dates of December 1 and April 1 (of each year). Significant impacts to pebble plain habitat can be mitigated to a less than significant level through off-site preservation. The project applicant shall pay compensation for the loss of special status botanical resources identified on the site, by the survey, by contributing to the funding of purchase and management of off-site habitat. The Applicant shall acquire habitat in the Big Bear Valley and dedicate to the CDFG or suitable conservation organization. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off site habitat shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development. An area containing no less than 2.1 acres of pebble plain habitat in an area located adjacent to other open space areas within the project vicinity shall be preserved in perpetuity. The preserved areas shall be protected from future development through a conservation easement or other appropriate mechanism.~~	

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	Sensitive Natural Communities/Habitats		
	5.8-2 *The proposed Project would impact portions of the Project site that are habitat for referenced sensitive species. Implementation of recommended mitigation measures would reduce impacts to a less than significant level.*	5.8-2a Street lamps on the project site shall not exceed 20 feet in height, shall be fully shielded to focus light onto the street surface and shall avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights shall utilize low color temperature lighting (e.g., red or orange). 5.8-2b Outdoor lighting for proposed homes on the individual tentative tracts shall not exceed 1,000 lumens. Furthermore, residential outdoor lighting shall not exceed 20 feet in height and must be shielded and focused downward to avoid lighting spillover onto adjacent open space or properties. These restrictions on outdoor lighting of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This requirement shall also be published in the Homeowner's Association CC&Rs. 5.8-2c To limit the amount of human disturbance ~~to~~ on adjacent natural open space areas, signs shall be posted along the northeastern and eastern perimeter of the project site where the property boundary abuts open space~~ directing people to keep out of the adjacent natural open space areas and to keep dogs leashed in areas adjacent to natural open space areas. This requirement shall be published in the Homeowner Association CC&Rs~~ with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash at all times." In addition, a requirement stating that residents shall keep out of adjacent open space areas to the north with the exception of designated trails will be published in the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents.	

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		5.8-2d Prior to ~~the issuance of individual building permits, landscaping designs~~ recordation of the final map, a landscaping plan for the entire tract shall be prepared (inclusive of a plant palette) with native trees and plant species, and, shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review shall determine that no non-native or invasive plant species are to be used in the proposed landscaping. The biologist should suggest appropriate native plant substitutes. A note shall be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform with the overall approved tract map landscaping plan. A requirement shall be included stating that residents shall include a restriction of the use of tree and plant species to only native trees/plants approved per the overall tract map landscaping plan. the Homeowner Association CC&Rs shall also restrict (individual lot owners) to use only native tree and plant species approved per the overall tract map landscaping plan.	
		5.8-2e ~~Garages with automatic door openers shall be required. No exterior construction shall occur between December 1 and April 1, when bald eagles are present~~. Garages with automatic door openers shall be required. No exterior construction, grading or vegetation clearing shall be permitted between December 1 and April 1, which is the wintering period for bald eagles (i.e., the season when bald eagles are present in the Big Bear area).	
		Also refer to mitigation measures 5.8-1a to 5.8-1f.	
	Jurisdictional Waters		
	5.8-3 *Development of the proposed Project ~~does not have~~has the potential to impact jurisdictional waters. Analysis has concluded that potentially significant impacts would be reduced to a less than significant level~~impact~~*	5.8-3 ~~No mitigation measures are recommended.~~ Per the direction of the California Department of Fish and Game, all unavoidable impacts to State and Federal jurisdictional lakes, streams, and associated	

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	~~*would occur in this regard after regulatory compliance*~~ *with implementation of the recommended mitigation measures*	habitat shall be compensated for with the creation and/or restoration of in-kind habitat on-site and/or off-site at a minimum 3:1 replacement-to-impact ratio. Additional requirements may be required through the permitting process depending on the quality of habitat impacted, project design and other factors.	
	Wildlife Movement		
	5.8-4 *Project implementation may interfere with the movement of a native resident or migratory wildlife species. Analysis has concluded that impacts are less than significant.*	5.8-4 No mitigation measures are recommended.	
	Regional and Local Policies/Plans		
	5.8-5 *Project implementation would not conflict with adopted regional and/or local policies/plans pertaining to biological resources. Analysis has concluded that impacts are less than significant.*	5.8-5 No mitigation measures are recommended.	
	Cumulative		
	5.8-6 *Cumulative development in the Project area may impact the area's biological resources. Analysis has concluded that* ~~*with implementation of the specified mitigation and compliance with all applicable County, State and Federal regulations concerning biological resources, a less than significant impact would occur in this regard.*~~*project implementation incrementally adding to impacts on bald eagle habitat in the Big Bear Valley would result in a significant and unavoidable cumulative impact to the wintering bald eagle population on Big Bear Lake.*	5.8-6 No mitigation measures are recommended.	
5.9	**CULTURAL RESOURCES**		
	Archaeological/Historical Resources		
	5.9-1 *The proposed Project may cause a significant impact to unknown archaeological and/or historic resources visible on-site. Implementation of recommended mitigation measures would reduce impacts to a less than significant level.*	5.9-1 Project-related grading, grubbing, trenching, excavations, and/or other earth-moving activities in the project area shall be monitored by a qualified archaeologist. In the event that a material of potential cultural significance is uncovered during such activities on the project site, all	No significant impacts related to Cultural Resources have been identified following implementation of mitigation measures referenced in this Section.

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		earth-moving activities in the project area shall cease and the archeologist shall evaluate the quality and significance of the material. Earth-moving activities shall not continue in the area where a material of potential cultural significance is uncovered until resources have been completely removed by the archaeologist and recorded as appropriate.	
	Paleontological Resources		
	5.9-2 *The proposed Project may cause a significant impact to unknown paleontological resources on-site. Implementation of recommended mitigation measures would reduce impacts to a less than significant level.*	5.9-2a Grading shall be monitored during excavation in areas identified as likely to contain paleontologic resources by a qualified paleontological monitor. Monitoring shall be accomplished for any undisturbed subsurface older alluvium, which might be present in the subsurface. The monitor shall be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments which are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert grading equipment to allow for removal of abundant or large specimens.	
		5.9-2b Recovered specimens shall be prepared to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.	
		5.9-2c Identification and curation of specimens into a museum repository with permanent retrievable storage shall occur for paleontological resources.	
		5.9-2d A report of findings shall be prepared with an appended itemized inventory of specimens. The report shall include pertinent discussion of the significance of all recovered resources where appropriate. The report and inventory when submitted to the appropriate Lead Agency, shall signify completion of the program to mitigate impacts to paleontologic resources.	

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	Burial Sites		
	5.9-3 *The proposed Project may cause a significant impact to Native American burial sites which could occur on-site. Implementation of the specified mitigation measures would reduce impacts to a less than significant level.*	5.9-3 In the event human remains are discovered during grading/ construction activities, work shall cease in the immediate area of the discovery and the Project Applicant shall comply with the requirements and procedures set forth in Section 5097.98 of the Public Resources Code, including notification of the County Coroner, notification of the Native American Heritage Commission, and consultation with the individual identified by the Native American Heritage Commission to be the "most likely descendent."	
	Cumulative		
	5.9-4 *Cumulative development may adversely affect cultural resources in the north shore area. Resources are evaluated and mitigated on a project-by-project basis.*	5.9-4 No mitigation measures are recommended.	
5.10	**GEOLOGY AND SOILS**		
	Slope Stability		
	5.10-1 *Development of the proposed Project could result in slope failures. Implementation of the recommended mitigation measures and compliance with the County Development Code and Uniform Building Code would reduce impacts to less than significant levels.*	5.10-1 The stability of ~~S~~south facing cut slopes shall be analyzed as part of the design-level geotechnical investigation. ~~u~~Utilize~~ing~~ 2:1 buttressed slopes using on site native soil materials, or ~~by~~ constructing geotextile-reinforced soil buttresses ~~where~~for planned unstable cut slopes~~ are planned~~ are typical engineering designs for stabilizing slopes. Either of these methods, or other methods must be approved by the San Bernardino County Department of Building and Safety~~Geologist for slope reinforcement may be utilized~~.	No significant impacts related to Geology and Soils have been identified following implementation of mitigation measures and/or compliance with applicable standards, policies and/or County of San Bernardino Development Code and standards set forth in the Uniform Building Code.
	Soil Erosion		
	5.10-2 *Development of the proposed Project could result in accelerated soil erosion. Project compliance with the County Development Code, the Uniform Building Code and the recommended mitigation measures would reduce impacts to a less than significant level.*	5.10-2a Due to the potential for erosion associated with younger alluvial deposits within the two major on-site stream channels, increased surface drainage quantities associated with development on-site shall be directed away from the stream channels.	

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		5.10-2b Prior to the issuance of Grading Permits, the Project Applicant shall prepare a Soil Erosion and Sedimentation Plan for submittal and approval by the County Building and Safety Department.	
	Ground Shaking		
	5.10-3 *Development of the proposed Project may increase the number of people/structures exposed to effects associated with seismically induced ground shaking. Implementation of the recommended mitigation measures and compliance with the County Development Code and the Uniform Building Code would reduce potential impacts to less than significant.*	5.10-3 Engineering design for all structures and roadways shall be based on the 2001 California Uniform Building Code. Construction plans shall be in accordance with seismic design standards set forth by the County's Development Code and Uniform Building Code.	
	Seiche		
	5.10-4 *Development of the proposed Project may expose people/structures to seiching as a result of significant ground motion related to an earthquake. Project compliance with recommended mitigation measures would reduce impacts to less than significant levels.*	5.10-4 Residential structures shall be located in areas which provide a minimum of five feet of freeboard above the high water line for any structures.	
	Expansive Soils		
	5.10-5 *Development of the proposed Project may create substantial risks to life property as a result of expansive soils. Implementation of the recommended mitigation measure would reduce impacts to less than significant levels.*	5.10-5 Prior to grading permit issuance, ~~geologic analysis/studies shall be required including 1)~~ a quantitative geotechnical analysis and~~of liquefaction, 2) a~~ design-level geotechnical engineering report shall be required and submitted to the County of San Bernardino Department of Building and Safety for their approval. ~~and 3) a design level engineering geology report.~~	
	Cumulative Impacts		
	5.10-6 *The proposed Project, combined with future development, may result in increased short-term impacts such as erosion and sedimentation, and long-term seismic impacts within the area. Mitigation is incorporated on a project-by-project basis to reduce impacts to a less than significant level in areas deemed suitable for development.*	5.10-6 No mitigation measures are recommended.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
5.11	**HYDROLOGY AND DRAINAGE**		
	Drainage and Runoff		
	5.11-1 *The proposed Project could significantly alter drainage patterns which could result in increased erosion potential and runoff. Impacts are concluded as less than significant with implementation of the Project design features (i.e., the provision of adequate outlet structures, storm drains to contain flows and proper bluff drainage).*	5.11-1 The proposed cross culverts shall be sized for 100-year burn and bulking flow rates. The burn and bulking method would increase the runoff from the natural areas. The method provided in the Los Angeles County Hydrology Manual is recommended. In addition, the cross culverts shall all be designed with headwalls to prevent CMP crushing, and shall be maintained adequately.	Due to inconclusive testing of potential overdraft conditions for the ground water basin associated with the North Shore Hydrologic Subunit, project and cumulative impacts are concluded to be significant and unavoidable. If the County of San Bernardino approves the project, the County shall be required to adopt findings in accordance with Section 15091 of the CEQA Guidelines and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the CEQA Guidelines. No additional significant impacts related to hydrology and water quality have been identified following implementation of the recommended mitigation measures and/or through regulatory compliance.
	Groundwater		
	5.11-2 *The proposed project may result in groundwater overdraft conditions. Although mitigation measures requiring further testing are referenced, based upon the evidence presented to date, it is concluded that groundwater overdraft is a significant adverse impact and until additional technical review is conducted, the project would result in an unavoidable adverse impact.*	~~5.11-2 Based upon the technical analysis presented, a potential groundwater overdraft condition would occur and no additional mitigation measures have been identified.~~ 5.11-2a Within three months of project approval, the Project Applicant shall submit a plan for a detailed geohydrologic investigation. The plan must present the possible sources of groundwater selected for the project and the methodology proposed to investigate those sources. If the on-site wells are to be utilized to serve this project, it must be determined if either could draw water from Big Bear Lake. The plan must be prepared by a California Registered Geologist. 5.11-2b Within six months of plan approval, the Project Applicant shall submit the results of the geohydrologic investigation. The report must be prepared by a California Registered Geologist. 5.11-2c Concurrently or within three months of approval by the geohydrologic report, the Project Applicant shall submit a groundwater monitoring plan in accordance with San Bernardino County's "Guidelines for Preparation of a Groundwater Monitoring Plan." The plan must be prepared by a California Registered Geologist.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	Water Quality – Construction		
	5.11-3 *Grading, excavation and construction activities associated with the proposed Project could impact water quality due to sheet erosion of exposed soils and subsequent deposition of particles and pollutants in drainage areas. Impacts would be reduced to a less than significant level through regulatory compliance and with incorporation of the recommended mitigation.*	5.11-3 Prior to Grading Permit issuance and as part of the Project's compliance with the NPDES requirements, a Notice of Intent (NOI) shall be prepared and submitted to the Santa Ana Regional Water Quality Control Board providing notification and intent to comply with the State of California general permit. Also, a Storm Water Pollution Prevention Plan (SWPPP) shall be completed for the construction activities on-site. A copy of the SWPPP shall be available and implemented at the construction-site at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction-site to the "maximum extent practicable." At a minimum, the following shall be implemented from the *California Storm Water Best Management Practice Handbook - Construction Activity*: ▪ *CA 1 Dewatering Operations* – This operation requires the use of sediment controls to prevent or reduce the discharge of pollutants to storm water from dewatering operations. ▪ *CA 2 Paving Operations* – Prevent or reduce the runoff of pollutants from paving operations by proper storage of materials, protecting storm drain facilities during construction, and training employees. ▪ *CA 3 Structural Construction and Painting* – Keep site and area clean and orderly, use erosion control, use proper storage facilities, use safe products and train employees to prevent and reduce pollutant discharge to storm water facilities from construction and painting. ▪ *CA 10 Material Delivery and Storage* – Minimize the storage of hazardous materials on-site. If stored on-site, keep in designated areas, install secondary	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		containment, conduct regular inspections and train employees. ▪ *CA 11 Material Use* – Prevent and reduce the discharge of pesticides, herbicides, fertilizers, detergents, plaster, petroleum products and other hazardous materials from entering the storm water. ▪ *CA 20 Solid Waste Management* - This BMP describes the requirements to properly design and maintain trash storage areas. The primary design feature requires the storage of trash in covered areas. ▪ *CA 21 Hazardous Waste Management* - This BMP describes the requirements to properly design and maintain waste areas. ▪ *CA 23 Concrete Waste Management* – Prevent and reduce pollutant discharge to storm water from concrete waste by performing on and off-site washouts in designated areas and training employees and consultants. ▪ *CA 24 Sanitary Septic Water Management* – Provide convenient, well-maintained facilities, and arrange regular service and disposal of sanitary waste. ▪ *CA 30 Vehicle and Equipment Cleaning* – Use off-site facilities or wash in designated areas to reduce pollutant discharge into the storm drain facilities. ▪ *CA 31 Vehicle and Equipment Fueling* – Use off-site facilities or designated areas with enclosures or coverings to reduce pollutant discharge into the storm drain facilities. ▪ *CA 32 Vehicle and Equipment Maintenance* – Use off-site facilities or designated areas with enclosing or coverings to reduce pollutant discharge into the storm	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		drain facilities. In addition, run a "dry site" to prevent pollution discharge into storm drains. ▪ *CA 40 Employee and Subcontractor Training* – Have a training session for employees and subcontractors to understand the need for implementation and usage of BMPs. ▪ *ESC 2 Preservation of Existing Vegetation* – Minimize the removal of existing trees and shrubs since they serve as erosion control. ▪ *ESC 10 Seeding and Planting* – Provide soil stability by planting and seeding grasses, trees, shrubs, vines, and ground cover. ▪ *ESC 11 Mulching* – Stabilize cleared or freshly seeded areas with mulch. ▪ *ESC 20 Geotextiles and Mats* – Natural or synthetics material can be used for soil stability. ▪ *ESC Dust Control* – Reduce wind erosion and dust generated by construction activities by using dust control measures. ▪ *ESC 23 Construction Road Stabilization* – All on-site vehicle transport routes shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust. ▪ *ESC 24* – Stabilized Construction Entrance – Stabilize the entrance pad to the construction area to reduce amount of sediment tracked off-site. ▪ *ESC 30 Earth Dikes* – Construct earth dikes of compacted soil to divert runoff or channel water to a desired location. ▪ *ESC 31 Temporary Drains and Swales* – Use temporary drains and swales to divert off-site runoff around the construction-site and stabilized areas and to direct it into sediment basins or traps.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		▪ *ESC 40 Outlet Protection* – Use rock or grouted rock at outlet pipes to prevent scouring of soil caused by high velocities. ▪ *ESC 41 Check Dams* – Use check dams to reduce velocities of concentrated flows, thereby reducing erosion and promoting sedimentation behind the dams. Check dams are small and placed across swales and drainage ditches. ▪ *ESC 50 Silt Fence* – Composed of filter fabric, these are entrenched, attached to support poles, and sometimes backed by wire fence support. Silt fences promote sedimentation behind the fence of sediment-laden water. ▪ *ESC 51 Straw Bale Barrier* – Place straw bales end to end in a level contour in a shallow trench and stake them in place. The bales detain runoff and promote sedimentation. ▪ *ESC 52 Sand Bag Barriers* – By stacking sand bags on a level contour, a barrier is created to detain sediment-laden water. The barrier promotes sedimentation. ▪ *ESC 53 Brush or Rock Filter* – Made of 0.75 to 3-inch diameter rocks placed on a level contour or composed of brush wrapped in filter cloth and staked to the toe of the slope provides a sediment trap. ▪ *ESC 54 Storm Drain Inlet Protection* – Devices that remove sediment from sediment laden storm water before entering the storm drain inlet or catch basin. ▪ *ESC 55 Sediment Trap* – A sediment trap is a small, excavated, or bermed area where runoff for small drainage areas can pass through allowing sediment to settle out.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
	Water Quality – Long-Term		
	5.11-4 *Project development may result in long-term impacts to the quality of storm water and urban runoff, subsequently impacting water quality. Impacts would be reduced to less than significant levels with incorporation of the recommended mitigation measures along with State and County Development Code requirements.*	5.11-4a Prior to Grading Permit issuance, a Water Quality Management Plan shall be developed and shall include both Non-Structural and Source Control BMPs. The WQMP shall conform to the San Bernardino County Draft NPDES permit and WQMP standards. The following are the minimum required controls to be implemented as a part of the *Water Quality Management Plan (WQMP) for Urban Runoff.* ▪ *Education for Property Owners, Tenants and Occupations* – The Property Owners Association is required to provide awareness educational material, including information provided by San Bernardino County. The materials shall include a description of chemicals that should be limited to the property and proper disposal, including prohibition of hosing waste directly to gutters, catch basins, storm drains or the lake. ▪ *Activity Restrictions* – The developer shall prepare conditions, covenants and restriction of the protection of surface water quality. ▪ *Common Area Landscape Management* – For the common landscape areas on-going maintenance shall occur consistent with County Administrative Design Guidelines or city equivalent, plus fertilizer and pesticide usage consistent with the instructions contained on product labels and with regulation administered by the State Department of Pesticide Regulation or county equivalent. ▪ *Common Area Catch Basin Inspection* – Property Owners Associations shall have privately owned catch basins cleaned and maintained, as needed. These are intended to prevent sediment, garden waste, trash and other pollutants from entering the public streets and storm drain systems.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		▪ *Common Area Litter Control* – POAs shall be required to implement trash management and litter control procedures to minimize pollution to drainage waters. ▪ *Street Sweeping Private Streets and Parking Lots* – Streets and Parking lots shall be swept as needed, to prevent sediment, garden waste, trash and other pollutants from entering public streets and storm drain systems. The following controls from the *California Storm Water Best Management Practice Handbook - Municipal* shall be employed: ▪ *SC10 Housekeeping Practices* - This entails practices such as cleaning up spills, proper disposal of certain substances and wise application of chemicals. ▪ *SC32 Used Oil Recycling* - May apply to maintenance and security vehicles. ▪ *SC72 Vegetation Controls* – Vegetation control typically includes chemical (herbicide) application and mechanical methods. Chemical methods are discussed in SC10. Mechanical methods include leaving existing vegetation, cutting less frequently, hand cutting, planting low maintenance vegetation, collecting and properly disposing of clippings and cuttings, and educating employees and the public. ▪ *SC73 Storm Drain Flushing* - Although general storm drain gradients are sufficiently steep for self-cleansing, visual inspection may reveal a buildup of sediment and other pollutants at the inlets or outlets, in which case flushing may be advisable. 5.11-4b The Water Quality Management Plan (WQMP) shall include Structural or Treatment BMPs. The structural BMPs utilized shall focus on meeting potential TMDL requirements for noxious aquatic plants, nutrients,	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION

sedimentation and siltation. The structural BMPs shall conform to the San Bernardino County NPDES permit and the San Bernardino WQMP standards.

Consistent with the WQMP guidelines contained in the *Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements* for San Bernardino County, Structural BMPs shall be required for the proposed Project. They shall be sized to comply with one of the following numeric sizing criteria or be considered by the permittees to provide equivalent or better treatment.

Volume Based BMPs shall be designed to infiltrate or treat either:

- The volume of runoff produced from the 85th percentile 24-hour storm event, as determined from the local historical rainfall record; or
- The volume of the annual runoff produced by the 85th percentile 24-hours rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or
- The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practice Handbook – Industrial/Commercial (1993); or
- The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event.

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		OR Flow–based BMPs shall be designed to infiltrate or treat either: ▪ The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or ▪ The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or ▪ The maximum flow rate of runoff, as determined from the local historical rainfall record that achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two. The following are the minimum required controls to be implemented as a part of the *Water Quality Management Plan (WQMP) for Urban Runoff*. ▪ *Control of Impervious Runoff* – Surface runoff shall be directed to landscaped areas or pervious areas. ▪ *Common Area Efficient Irrigation* – Physical implementation of the landscape plan consistent with County Administrative Design Guidelines or city equivalent, which may include provision of water sensors, programmable irrigation timers, etc. ▪ *Common Area Runoff-Minimizing Landscape Design* – Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. ▪ *Catch Basin Stenciling* – "No Dumping – Flows to Lake" or equivalent effective phrase shall be stenciled on catch basins to alert the public as to the destination of pollutant discharging into storm drain.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		▪ *Debris Posts* – These shall be installed to prevent large floatable debris from entering the storm drains. They shall be placed upstream of the cross culverts. ▪ *Inlet Trash Racks* – These shall be installed where appropriate to reduce intake and transport through the storm drain system of large floatable debris. Trash racks shall be provided where drainage from open areas enters storm drain or cross culverts.	
		5.11-4c Storm water treatment under the NPDES Permit and the future TMDL requirements shall include the construction of treatment BMPs. Treatment BMPs appropriate for on-site use shall include infiltration trenches and basins, swales, inlet filtration, and/or water quality basins. All storm water runoff shall be treated before leaving the site to reduce pollutants in Big Bear Lake. <u>Infiltration Trenches and Basins</u> Infiltration Trenches and/or Basins shall be used on site to meet potential future TMDLs for noxious aquatic plants and nutrients. Infiltration trenches and basins treat storm water runoff through filtration. A typical infiltration trench is essentially an excavated trench, that is lined with filter fabric and backfilled with stones. Depth of the infiltration trench shall range from three to eight feet and shall be located in areas with permeable soils, and water table and bedrock depth situated well below the bottom of the trench. Trenches shall not be used to trap coarse sediments since large sediment would likely clog the trench. Grass buffers may be installed to capture sediment before it enters the trench to minimize clogging. Infiltration basins shall be used for drainage areas between five and 50 acres. Infiltration basins shall be either in-line or off-line, and may treat different volumes such as the water quality volume or the 2-year or 10-year storm.	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		Swales The project shall implement either vegetative swales, enhanced vegetated swales utilizing check dams and wide depressions, a series of small detention facilities designed similarly to a dry detention basin, or a combination of these treatment methods into a treatment train (series of Structural BMPs). The Water Quality Management Plan shall address treatment for the Project to assure that runoff from the site is treated to the "maximum extent practicable". The swales shall be treated as water quality features and shall be maintained differently than grass areas. Specifically, pesticides, herbicide, and fertilizers, which may be used on the grass areas, shall not be used in the vegetation swales. Filtration Filtration shall be implemented as a treatment method and shall use drop-in infiltration devices or inline devices. Drop-infiltration devices at all curb inlets within the internal parking lots shall be implemented to provide potential pollutant removal. Existing examples of these filtration devices include the Drain Pac Storm Drain Inserts and Fossil Filters. These types of devices are efficient at removing oil and grease, debris, and suspended solids from treated waters. Some of these devices have also exhibited high efficiencies at removing heavy metals and other pollutants. Inline devices suggested for use onsite include the Continuous Deflection Separator (CDS® unit). Once the runoff has entered the storm drain, an in-line diversion would direct the treatment flow to a CDS® unit. The CDS® unit is a non-blocking, non-mechanical screening system, which would provide a second line of defense for solids removal. Adsorption materials can	

EIR SECTION	IMPACTS	MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION
		be added within the CDS® unit to aid in the removal of oil and grease. The treated flow will exit the CDS® unit and continue downstream. To assure the efficiency of these filtration devices, monitoring shall be conducted. The use of street sweeps on the parking lots and streets shall aid in reducing the amounts of sediment and debris that flow through the devices. This will extend the effectiveness of the devices during a storm and will lower the frequency of required maintenance. The devices shall be checked and cleaned, if necessary, once a month during the rainy season, following any precipitation and at the end of the dry season prior to the first precipitation event of the rainy season. Consideration shall be given to using these filtration units in other areas besides the parking lot inlets. Another potential location is at the downstream end of the tributary pipes that feed the discharge point. Siting these units at a downstream point would allow for the treatment of a greater amount of runoff.	
	Cumulative Impacts		
5.11-5	*The proposed Project along with other future development may result in increased hydrology and drainage impacts in the area. Due to inconclusive of potential overdraft conditions, cumulative groundwater impacts are concluded to be significant and unavoidable. Other hydrology and drainage impacts are evaluated on a project-by-project basis in order to mitigate to a less than significant level.*	5.11-5 No mitigation measures are recommended.	

2.3 SUMMARY OF PROJECT ALTERNATIVES

In accordance with California Environmental Quality Act (CEQA) Guidelines Section 15126.6, Section 7.0 describes a range of reasonable alternatives to the proposed project which could feasibly attain the basic objectives of the proposed project, while evaluating the comparative merits of each alternative. The analysis focuses on alternatives capable of eliminating significant adverse environmental effects or

reducing them to less than significant levels, even if these alternatives would impede, to some degree, the attainment of the project objectives. Potential environmental impacts are compared to impacts from the proposed project. The following is a description of each of the alternatives evaluated in Section 7.0.

"NO PROJECT/NO DEVELOPMENT" ALTERNATIVE

Implementation of the "No Project/No Development" Alternative would retain the site in its current condition. None of the improvements proposed as part of the project and/or the existing designation would occur. The following discussion evaluates the potential environmental impacts associated with the No Project/No Development Alternative as compared to impacts from the proposed Project.

"NO PROJECT/EXISTING DESIGNATION" ALTERNATIVE

Implementation of the "No Project/Existing Designation" Alternative would be in accordance with the existing Official Land Use District Rural Living-40 (40-acre minimum lot size). This Alternative would result in 1.5 residential lots on the project site. This Alternative would be less intensive than the proposed Project. Approximately three persons (1.5 housing units x 2.15 persons/household) would be added to the permanent population of the Community of Fawnskin. It is further noted that in addition to a single-residential structure, other uses can be allowed including those in the "Additional Uses" section of the County Development Code, subject to a Conditional Use Permit. The following discussion evaluates the potential environmental impacts associated with the No Project/Existing Designation Alternative as compared to impacts from the proposed Project.

"REDUCED DENSITY, WITHOUT ROAD ALIGNMENT AND WITHOUT MARINA" ALTERNATIVE

For the Reduced Density, Without Road Realignment and Without Marina Alternative, development of 62 residential lots and associated infrastructure (as depicted in the project description) would occur on the north side of the existing State Route 38 alignment. State Route 38 would not be realigned and no residential development would occur to the south of State Route 38. The land area south of State Route 38, along the lakefront, would be retained in its current state. Approximately 133 persons (62 housing units x 2.15 persons/household) would be added to the permanent population of the Community of Fawnskin.

"REDUCED DENSITY, WITH PROJECT REDESIGN" ALTERNATIVE

For the Reduced Density, With Project Redesign Alternative, development of 66 residential lots and associated infrastructure would occur on project site. Implementation of this Alternative would include the realignment of State Route 38. Twenty-one (21) and 45 lots would be developed on the south and north sides of the realigned State Route 38, respectively. This Alternative would include a marina facility, with 72 boat slips. Approximately 142 persons (66 housing units x 2.15 persons/household) would be added to the permanent population of the Community of Fawnskin.

3.0 Project Description

3.0 PROJECT DESCRIPTION

3.1 PROJECT LOCATION AND SETTING

PROJECT LOCATION

The proposed Moon Camp Tentative Tract #16136 Residential Subdivision ("Moon Camp") encompasses approximately 62.43 acres along the northwest shore of Big Bear Lake, in the community of Fawnskin, County of San Bernardino (refer to Exhibit 3-1, *Regional Vicinity*). The Big Bear Lake area serves primarily as a destination resort community and many of the residences are second homes. As many as 50,000 people visit the area on peak holiday weekends. The north shore area is less populated than the south shore and most visitors utilize the south shore commercial and recreational amenities such as ski areas, restaurants, and hotel facilities.

The Project site is located adjacent to the northwest shore of Big Bear Lake, in the relatively undeveloped eastern portion of Fawnskin (refer to Exhibit 3-2, *Local Vicinity*). More specifically, the site is located in the northern half of Section 13, Township 2 North, Range 1 West, San Bernardino Base and Meridian (APN: 0304-082-14, 0304-091-12, 13, and 21). The Project site is generally situated between Flicker Road to the north, Big Bear Lake to the south, Polique Canyon Road to the east, and Oriole Lane/Canyon Road to the west. Regional access to the site is provided via State Route 38, which currently bisects the property.

EXISTING CONDITIONS ON-SITE

The 62.43-acre Project site (designated RL-40, Rural Living, by the County of San Bernardino) slopes from north to south. Elevations range from 6,747 feet above mean sea level (MSL) at the lakefront, to a high of 6,960 feet above MSL at the northeast boundary. Total relief is therefore 483 feet and slopes range from five percent (5%) to forty percent (40%). A natural drainage ravine occurs in the eastern portion of the property. The site is vegetated with Jeffrey Pine forest with approximately 2,772 trees existing on-site and a pebble plain habitat occurs in the western portion of the property. State Route 38, dirt roads, and trails traverse the Project site (refer to Exhibit 3-3, *Aerial Photograph*). Additionally, two water wells, which are currently non-operational, exist on the Project site.

SURROUNDING LAND USES

The site is bounded by the following land uses:

North: Single-family residences along Flicker Road, a local street, border the site to the north. Flicker Road traverses the site's northern boundary in an east/west direction. United States Forest Service lands occupy the eastern portion of the site's northern boundary.

South: Big Bear Lake borders the site to the south.

Exhibit 3-1

RBF CONSULTING

PLANNING ■ DESIGN ■ CONSTRUCTION

12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Regional Vicinity

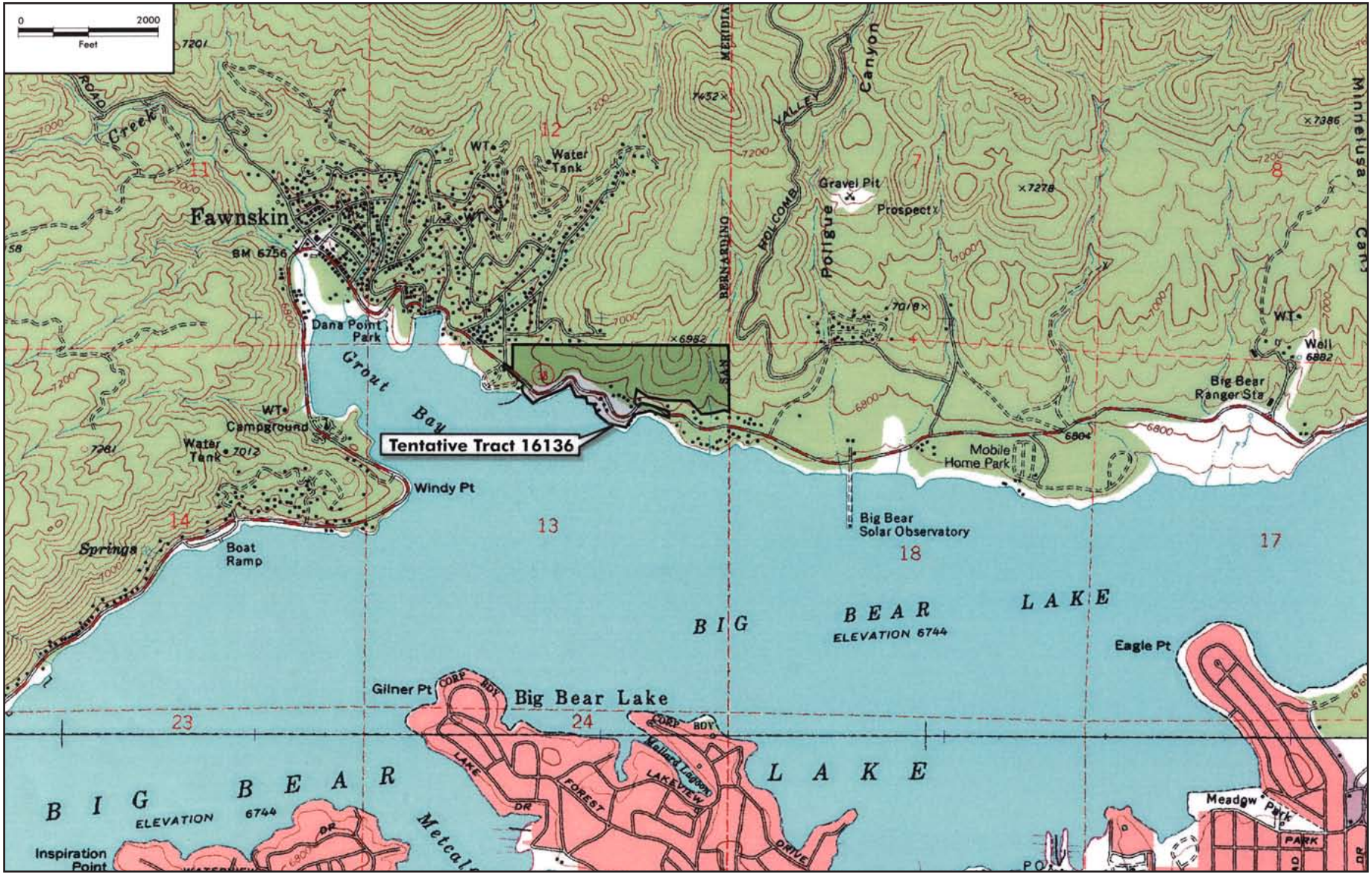

Exhibit 3-2

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12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Local Vicinity

Exhibit 3-3

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PLANNING ■ DESIGN ■ CONSTRUCTION

12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Aerial Photograph

East: Single-family residences along North Shore Drive (State Route 38) border the site to the south. The residences are located on the southern portion of the site's eastern boundary. United States Forest Service lands occupy the northern portion of the site's eastern boundary.

West: Single-family residences along Oriole Lane border the site to the west.

Table 3-1, *Existing Land Use Designations*, outlines the Project site's current land use designations based upon references contained in the San Bernardino County General Plan Land Use Element.

Table 3-1
Existing Land Use Designations

Existing Land Use		Official Land Use District	IL
Project Site	Vacant	RL-40	IL1
North	Forest, Residential (NW)	RC, RL-40, and RS	IL1 & IL5
South	Big Bear Lake, Residential (SE)	FW, RS	IL1
East	Vacant, Residential (SE)	RC, RS	IL1 & IL5
West	Vacant, Residential	PD-12/1, RS	IL1
IL	Infrastructure Improvement Level – Levels range from 1 to 5 and are tied to the availability of the basic infrastructure required for development (roads, water and wastewater). IL-1 represents the most intense urban areas before development can be permitted to the degree allowed by a site's official land use designation, existing and planned infrastructure must be in place at levels consistent with the designated IL areas. Typical lot sizes for IL-1 is less than ½ acre.		
RC	Resource Conservation: Allows for, but is not limited to: row, field, tree, and nursery crop cultivation; single dwelling unit; social care facility; and animal raising. Minimum parcel size is 40 acres.		
RS	Single Residential: Allow for, but is not limited to: row, field, tree, and nursery crop cultivation; single dwelling unit; and social care facility. The minimum net parcel size is 7,200 square feet. The maximum housing density is 4 dwelling units per acre.		
RL-40	Rural Living: Allows for, but is not limited to: row, field, tree and nursery crop cultivation; single dwelling unit; social care facility and animal raising. The minimum parcel size for the RL designation is 2.5 acres. The minimum parcel size for the RL-40 designation is 40 acres.		
PD-12/1	Planned Development: Allows for row, field, tree, and nursery crop cultivation; single dwelling unit; social care facility and animal raising. Minimum parcel size is 40 acres – map suffix allows lot sizes less than 40 (e.g., PD-12/1 = Planned Development – 12 units/acre).		
FW	Floodway: Uses only permitted where the property owner understands that the use is placed at their own risk and that it shall not obstruct and/or deflect flows onto other property. Minimum parcel size is 10 acres.		
Source: County of San Bernardino Development Code.			

3.2 BACKGROUND AND HISTORY

The community of Fawnskin was founded in 1916. By 1918, Fawnskin had already grown into a community of more than 100 summer homes with a string of resort camps lining the lakeshore to the east. Among these resorts was Moon Camp. By

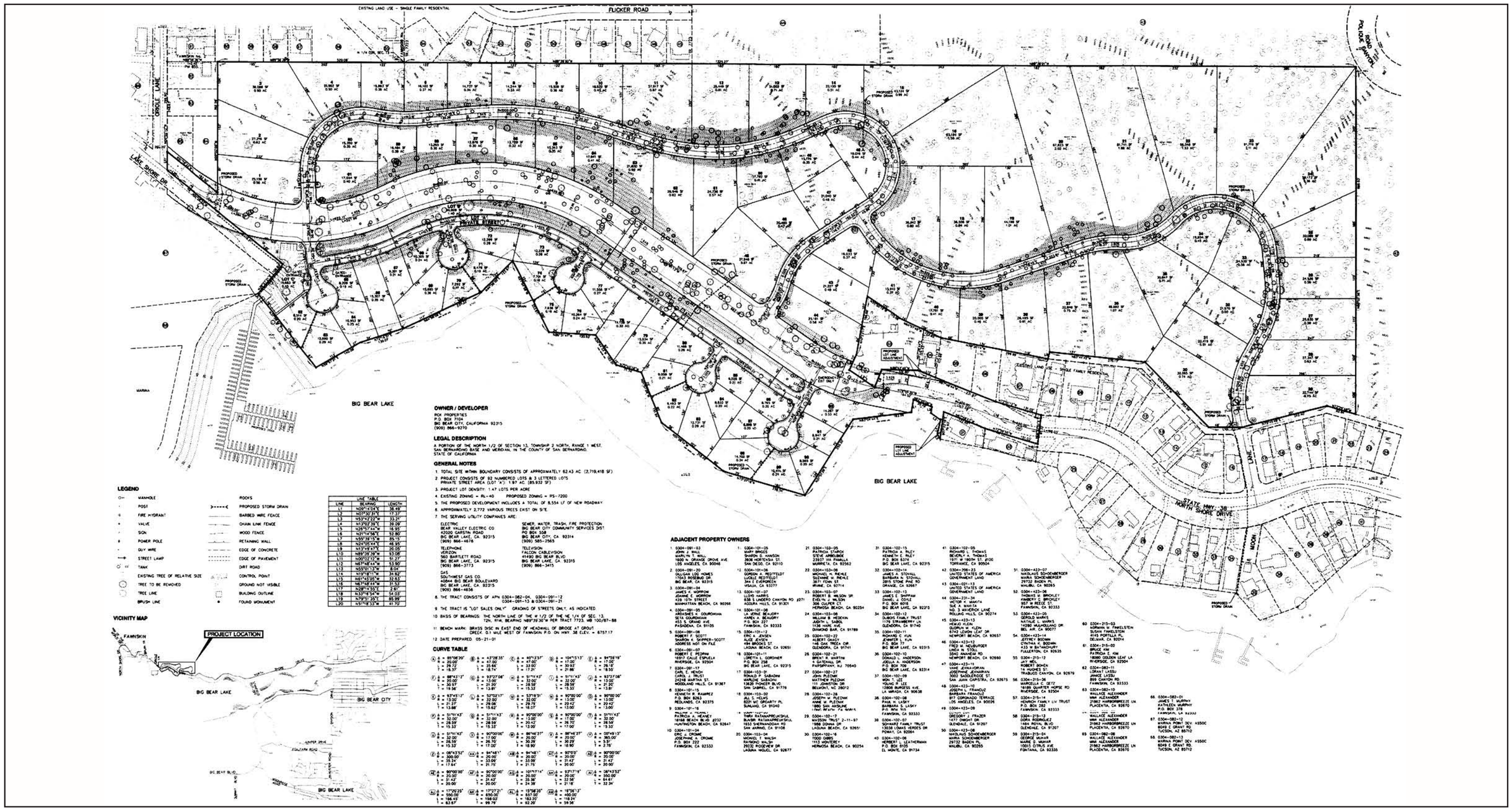
1928, at least nine commercial camps or lodges were in operation in proximity to Fawnskin. The popularity of the camps continued into the 1940's and by the 1960's, with rapid advances in modern transportation technology, American lifestyles began to erode the popularity of such resort camps.

The site has historically remained vacant. However, on-site improvements include North Shore Drive, which currently bisects the property in an east/west direction, and two on-site water wells that are non-operational at this time. One water well is located on the north side of State Route 38 and the other well on the south side of State Route 38. Additionally, the Big Bear Municipal Water District has previously granted permitting rights to a dock facility. Refer to Section 5.2, *Recreation*, for additional information.

3.3 PROJECT CHARACTERISTICS

The Project proposes a 95-lot residential subdivision with lots ranging in size from 0.17 acres (7,292 square feet) to 2.11 acres (refer to Exhibit 3-4, *Site Plan*). Lots would be sold individually and development of lots and construction of homes would be by custom design. Access to 64 residential lots located within the northerly Project area (located north of North Shore Drive), would be provided via a loop road. The remaining 31 residential lots would be located south of North Shore Drive. The proposal is a Tentative Tract Map for 92 numbered and three lettered lots. The three lettered lots are identified as follows: (1) Lot "A" is a private street designed to provide access to the southernmost lots; (2) Lot "B" is a 1.4-acre strip of land that would remain between the relocation of State Route 38 and the private Street, Lot "A"; and (3) Lot "C" is a gated entrance to the Project, including a proposed boat dock, consisting of 100 boat slips, which would be available for use by residents of the tract and accessible by Lot "C". Common areas, including the parking lot, boat docks, private streets, and common landscape lots would be maintained by a home owner's association to be established with the recordation of the final map. Lots proposed along the lake front (Nos. 62-92) would be provided with gated access and private streets. Lot Nos. 1 to 61 would be located along a public street and would not be gated.

The Project includes relocation of North Shore Drive, also referred to as State Route 38, to allow development of lakeshore lots. An approximately 2,498-foot segment of the roadway would be relocated. The maximum distance of relocation, as designed, is 207 feet to the north. The design includes a 76-foot road width, with 14-foot shoulder/bikeway access, resulting in a 104-foot right-of-way via a loop road that would include five separate cul-de-sac drives to access lakefront lots. Of the estimated 2,772 trees existing on the Project site, approximately 655 trees (24 percent) would be removed for roadway construction. Additional tree removal could occur during individual lot development and construction of custom homes; the design of which is not part of this Project. State Route 38 would remain open at all times during construction of the proposed roadway realignment, with proper traffic controls implemented.



OWNER / DEVELOPER

ROK PROPERTIES
P.O. BOX 7104
BIG BEAR CITY, CALIFORNIA 92315
(909) 866-9270

LEGAL DESCRIPTION

A PORTION OF THE NORTH 1/2 OF SECTION 13, TOWNSHIP 2 NORTH, RANGE 1 WEST, SAN BERNARDINO BASE AND MERIDIAN, IN THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

GENERAL NOTES

1. TOTAL SITE within BOUNDARY CONSISTS OF APPROXIMATELY 82.43 AC (2,719,418 SF)
2. PROJECT CONSISTS OF 92 NUMBERED LOTS & 3 LETTERED LOTS
   PRIVATE STREET AREA (LOT "A"): 1.97 AC. (85,932 SF)
3. PROJECT LOT DENSITY: 1.47 LOTS PER ACRE
4. EXISTING ZONING = RL-40 PROPOSED ZONING = RS-7200
5. THE PROPOSED DEVELOPMENT INCLUDES A TOTAL OF 8,554 LF OF NEW ROADWAY.
6. APPROXIMATELY 2,772 VARIOUS TREES EXIST ON SITE.
7. THE SERVING UTILITY COMPANIES ARE:

ELECTRIC BEAR VALLEY ELECTRIC CO 42000 GARSTIN ROAD BIG BEAR LAKE, CA. 92315 (909) 866-4678	SEWER, WATER, TRASH, FIRE PROTECTION BIG BEAR CITY COMMUNITY SERVICES DIST PO BOX 3068 BIG BEAR CITY, CA 92314 (909) 585-2565
TELEPHONE VERIZON 560 BARTLETT ROAD BIG BEAR LAKE, CA. 92315 (909) 866-3773	TELEVISION FALCON CABLEVISION 41490 BIG BEAR BLVD. BIG BEAR LAKE, CA. 92315 (909) 866-3415
GAS SOUTHWEST GAS CO. 40844 BIG BEAR BOULEVARD BIG BEAR LAKE, CA. 92315 (909) 866-4656	

8. THE TRACT CONSISTS OF APN 0304-082-04, 0304-091-12
   0304-091-13 & 0304-091-21
9. THE TRACT IS "LOT SALES ONLY" GRADING OF STREETS ONLY, AS INDICATED.
10. BASIS OF BEARINGS: THE NORTH LINE OF THE W 1/2 OF THE NE 1/4 OF SEC. 13, T2N, R1W, BEARING N89°39'30"W PER TRACT 7723, MB 100/87-88
11. BENCH MARK: BRASS DISC IN EAST END OF HEADWALL OF BRIDGE AT GROUT CREEK, 0.1 MILE WEST OF FAWNSKIN P.O. ON HWY. 38 ELEV. = 6757.17
12. DATE PREPARED: 05-21-01

LEGEND

MANHOLE		ROCKS	
POST	>----<	PROPOSED STORM DRAIN	
FIRE HYDRANT	———	BARBED WIRE FENCE	
VALVE	———	CHAIN LINK FENCE	
SIGN	———	WOOD FENCE	
POWER POLE	———	RETAINING WALL	
GUY WIRE	———	EDGE OF CONCRETE	
STREET LAMP	———	EDGE OF PAVEMENT	
TANK	———	DIRT ROAD	
EXISTING TREE OF RELATIVE SIZE		CONTROL POINT	
TREE TO BE REMOVED		GROUND NOT VISIBLE	
TREE LINE		BUILDING OUTLINE	
BRUSH LINE		FOUND MONUMENT	

LINE TABLE

LINE	BEARING	LENGTH
L1	N09°11'05"E	38.49'
L2	N03°30'31"E	17.33'
L3	N53°42'22"W	33.21'
L4	N13°02'39"E	39.09'
L5	N26°57'44"W	16.95'
L6	N31°14'58"E	52.80'
L7	N55°33'15"W	85.15'
L8	N23°05'44"E	46.95'
L9	N13°49'47"E	26.05'
L10	N88°35'39"W	93.08'
L11	N00°03'37"W	51.27'
L12	N87°48'44"W	53.90'
L13	N55°01'13"W	8.04'
L14	N19°18'11"W	34.82'
L15	N61°43'35"W	33.83'
L16	N87°48'44"W	31.53'
L17	N28°11'05"E	2.61'
L18	N33°16'54"W	54.03'
L19	N79°51'35"E	85.99'
L20	N51°18'13"W	41.70'

VICINITY MAP

CURVE TABLE

(A) Δ = 85°08'20" R = 20.00' L = 29.72' T = 18.37'	(B) Δ = 43°28'35" R = 47.00' L = 35.66' T = 18.74'	(C) Δ = 90°12'33" R = 47.00' L = 33.90' T = 17.21'	(D) Δ = 104°15'13" R = 17.00' L = 30.93' T = 21.86'	(E) Δ = 94°28'19" R = 17.00' L = 28.18' T = 18.53'
(F) Δ = 88°43'27" R = 20.00' L = 30.97' T = 19.56'	(G) Δ = 93°27'08" R = 13.00' L = 21.20' T = 13.81'	(H) Δ = 90°12'33" R = 33.00' L = 28.58' T = 15.33'	(I) Δ = 51°51'43" R = 32.00' L = 15.33' T = 8.27'	(J) Δ = 93°27'08" R = 13.00' L = 21.20' T = 13.81'
(K) Δ = 53°41'17" R = 31.00' L = 29.04' T = 15.66'	(L) Δ = 53°03'37" R = 32.00' L = 29.62' T = 16.01'	(M) Δ = 53°03'37" R = 32.00' L = 29.62' T = 16.01'	(N) Δ = 90°00'00" R = 13.00' L = 20.42' T = 13.00'	(O) Δ = 90°00'00" R = 13.00' L = 20.42' T = 13.00'
(P) Δ = 51°51'43" R = 32.00' L = 28.97' T = 15.33'	(Q) Δ = 51°51'43" R = 32.00' L = 28.97' T = 15.33'	(R) Δ = 90°00'00" R = 13.00' L = 20.42' T = 13.00'	(S) Δ = 90°00'00" R = 13.00' L = 20.42' T = 13.00'	(T) Δ = 51°51'43" R = 32.00' L = 28.58' T = 15.33'
(U) Δ = 51°51'43" R = 32.00' L = 28.58' T = 15.33'	(V) Δ = 90°00'00" R = 17.00' L = 26.70' T = 17.00'	(W) Δ = 88°46'27" R = 20.00' L = 30.29' T = 18.90'	(X) Δ = 88°46'27" R = 20.00' L = 30.29' T = 18.90'	(Y) Δ = 09°49'13" R = 380.00' L = 65.14' T = 32.64'
(Z) Δ = 08°43'33" R = 500.00' L = 38.04' T = 19.04'	(AA) Δ = 94°48'51" R = 20.00' L = 33.09' T = 21.75'	(AB) Δ = 94°48'51" R = 20.00' L = 33.09' T = 21.75'	(AC) Δ = 90°00'00" R = 20.00' L = 31.42' T = 20.00'	(AD) Δ = 90°00'00" R = 20.00' L = 31.42' T = 20.00'
(AE) Δ = 90°00'00" R = 20.00' L = 31.42' T = 20.00'	(AF) Δ = 90°00'00" R = 20.00' L = 31.42' T = 20.00'	(AG) Δ = 101°17'14" R = 20.00' L = 35.36' T = 24.38'	(AH) Δ = 83°13'19" R = 20.00' L = 29.05' T = 17.78'	(AI) Δ = 08°43'33" R = 550.00' L = 41.81' T = 20.94'
(AJ) Δ = 17°20'29" R = 550.00' L = 166.43' T = 83.87'	(AK) Δ = 13°23'21" R = 650.00' L = 151.88' T = 99.79'	(AL) Δ = 15°58'39" R = 657.00' L = 183.20' T = 92.20'	(AM) Δ = 18°26'13" R = 400.00' L = 128.74' T = 58.56'	

ADJACENT PROPERTY OWNERS

1. 0304-091-03
JOHN J. WALL
MARILYN T. WALL
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2. 0304-091-20
CALLIGAN LOG HOMES
17043 RIVERSIDE DR.
BIG BEAR, CA 92315

3. 0304-091-04
JAMES K. MORROW
JOANNE E. MORROW
428 10TH STREET
MANHATTAN BEACH, CA 90266

4. 0304-091-09
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SETA GOURDIKIAN
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PASADENA, CA 91105

5. 0304-091-08
ROBERT F. SCOTT
SHARON K. SHIPPER-SCOTT
ADDRESS NOT ON FILE

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7. 0304-091-13
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CAROL J. TRUST
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WOODLAND HILLS, CA 91367

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LUCILLE REDITELDT
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BLANDA RATANAPRECHASYLA
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MURRIETA, CA 92562

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26. 0304-102-21
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MATTHEW PLECHNK
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BELMONT, NC 28012

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ANNE M. PLECHNK
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29. 0304-102-17
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42. 0304-206-23
UNITED STATES OF AMERICA
GOVERNMENT LAND

43. 0304-021-12
UNITED STATES OF AMERICA
GOVERNMENT LAND

44. 0304-271-26
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%K. A. MANTIA
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MMI ALEXANDER
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88. 0304-082-13
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8245 E GRANT RD.
TUCSON, AZ 85712

Source: Hicks & Hartwick, Inc., May 21, 2001.

Not to Scale

RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION

12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Site Plan

Exhibit 3-4

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The Project also requires a General Plan Amendment/Land Use District Amendment from RL-40 Rural Living (40-acre minimum lot) to RS-7200 Single Residential (7,200 square foot minimum lot size). The proposed realignment of North Shore Drive requires an Amendment to the County's Circulation Element.

3.4 PROJECT OBJECTIVES

The following objectives have been identified for the proposed Project:

- Provide up to 92 single-family residential lots to be developed as custom lots in the future;
- Establish single-family residential lots that are part of a planned development;
- Realign State Route 38 to improve the design of the roadway. More specifically, eliminate existing sharp curves of the roadway to minimize conflicts on State Route 38 and Project access roads. The proposed roadway realignment would also create the opportunity for lakefront residential lots; and
- Provide marina facilities for residents of Moon Camp to access Big Bear Lake.

3.5 PHASING

The proposed subdivision is a custom lot residential development. All lots would be sold for future construction of custom homes. Individual improvements and continued buildout of Moon Camp would occur incrementally over time beginning with the realignment/construction of North Shore Drive. The exact details of construction of each individual lot would be evaluated by the County of San Bernardino on a project-by-project basis. If the market continues strong, then all the off-site improvements would be installed (all improvements within the tract, but not on individual lots) and the final tract map recorded as one phase.

3.6 AGREEMENTS, PERMITS AND APPROVALS

The County of San Bernardino is the Lead Agency for the Project and has discretionary authority over the primary Project proposal. To implement this Project, the Applicant will need to obtain the following permits/approvals:

- Big Bear Municipal Water District – Per the discretion of the Water District: a Dock System and License Agreement, Yacht Club Dock License, and/or Shore Zone Alteration Permit.
- Caltrans – Project Study Report (PSR) and Traffic Impact Study (TIS) for SR-38 Encroachment Permit.

- City of Big Bear Lake, Department of Water and Power, or Big Bear City Community Services District, or the County of San Bernardino Special Districts – Water service permits and approvals.

- County of San Bernardino Board of Supervisors – Approval of a General Plan Amendment (for Land Use and Circulation Elements), Conditional Use Permit for Marina Parking Lot, Tentative Tract Map, Certification of the Environmental Impact Report.

- California Department of Fish & Game – 1602 Streambed Alteration Agreement.

- California Division of Forestry – Timber Harvest Plan (THP). The property is located within the boundaries of the U.S. National Forest Service but is not owned by the U.S. Forest Service.

- California State Water Resources Control Board – General Storm Water Permit for Construction and Storm Water Pollution Prevention Plan (SWPPP).

- California Regional Water Quality Control Board – Clean Water Act Section 401 Permit.

- U.S. Army Corps of Engineers – Clean Water Act Section 404 Permit.

4.0 Basis for Cumulative Analysis

4.0 BASIS FOR CUMULATIVE ANALYSIS

Section 15355 of the State California Environmental Quality Act (CEQA) Guidelines, as amended, provides the following definition of cumulative impacts: "Cumulative impacts refers to two or more individual effects which, when considered together, are considerable, or which compound or increase other environmental impacts." Pursuant to Section 15130(a) of the aforementioned Guidelines, cumulative impacts of a project shall be discussed when the project's affect is cumulatively considerable, as defined in Section 15065(c) of the Guidelines. The Initial Study Checklist provided as part of Appendix 15.1 indicates that the proposed project may yield potentially significant cumulative effects. As a result, Section 5.0 of this EIR provides a cumulative impact assessment for each applicable environmental issue, and does so to a degree which reflects each impact's severity and likelihood of occurrence.

As indicated above, a cumulative impact involves two or more individual effects. Per State CEQA Guidelines Section 15130(b), the discussion or cumulative impacts shall be guided by the standards of practicality and reasonableness. Per CEQA Guidelines Section 15130(b) the following elements are necessary in an adequate discussion of significant cumulative impacts:

1. Either:

   a. A list of past, present and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the Agency, or

   b. A summary of projections contained in an adopted General Plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact.

2. A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and

3. A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

Table 4-1, *Cumulative Projects List*, identifies related projects and other possible development in the area determined as having the potential to interact with the proposed project to the extent that a significant cumulative effect may occur. Information integral to the identification process was obtained from the City of Big Bear Lake, County of San Bernardino, and a review of several secondary data sources. The resulting related projects include primarily only those determined to be at least indirectly capable of interacting with the Moon Camp project. Table 4-1*, Cumulative Projects List,* summarizes the related projects according to location, type, and number of units realistically expected to develop on the site.

In addition, it is noted that the Traffic Analysis and corresponding Air Quality and Noise Assessments were prepared in accordance with the Congestion Management Program requirements for San Bernardino County. The study area was determined based on the contribution of project traffic to the surrounding roadway system.

Table 4-1
Cumulative Project List

Project Name	Location	Description	Status
County of San Bernardino			
TR 12217 (Marina Point)	North Shore Drive, southwest side, south of Red Robin Drive, in Fawnskin	132-unit Condominium Complex on approximately 12.5 acres plus approximately 15.7 acres of off-site lake improvements.	Recorded but not constructed.
TR 15465 (Kelsch)	Brookside Lane, Cedar Dell in Fawnskin	Single-Family Residential, minimum 20,000 square foot lots to establish 62 residential lots. Five lettered lots for water tank, interior road and open space conservation. Total of 74 acres.	Has not Recorded.
Relocation of Moonridge Zoo from the South Shore	North Shore Drive, adjacent to Discovery Center	Animal Park on a 25 acre lot, develop 5 to 7 acres to house approximately 150 animals and include; educational facilities, hospital, concession stands, and promissory.	Has not Recorded.
City of Big Bear Lake			
Site Approval (CUP) and Design Review 2001-167	41865 Fox Farm Road	To construct and operate a self-storage facility totaling 68,200 s.f. covered recreational vehicle storage facility totaling 18,840 s.f. and a two-story 5,916 s.f. mixed-use building.	Recorded but not constructed.
Site Approval (CUP) and Design review 2001-043, major Deviation 2001-044, and Minor Subdivision 2001-062 (TT No. 15705)	39708, 39720, 39730, 39738 and 39756 Big Bear Boulevard	To construct a 91-unit hotel with ancillary uses including a 4,000 s.f. banquet facility, 1,068 s.f. restaurant, 1,700 s.f. lounge 500 s.f. lobby service bar and a 624 s.f. maintenance building and structure.	Recorded but not yet constructed.
TT application 2002-006, TT Map No. 16297 – Wolf Creek Estates, Variance 2002-007, and Developer Agreement Variance	Southern portion of the Bear Meadows condominium project, Lot 4-D of Tract 12092.	To subdivide a 2.46-acre parcel into 10 lots for lot sales and future single family residential home construction.	Recorded but not yet constructed.
Plot Plan Review 2002-034	40679 Lakeview Drive	To reuse an existing vacant building as an indoor retail mall and use an existing off-site parking lot.	Recorded but not yet constructed.

5.0 Description of Environmental Setting, Impacts and Mitigation Measures

5.0 DESCRIPTION OF ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

5.1 LAND USE AND RELEVANT PLANNING

The purpose of this Section is to identify the existing land use conditions, analyze project compatibility with existing uses, consistency with relevant planning policies and to recommend mitigation measures to lesson the significance or avoid potential impacts. Information presented in this section is based upon site surveys performed by RBF Consulting in February 2002, site photographs, the County of San Bernardino General Plan and Development Code, and the General Plan EIR for the City of Big Bear Lake. This section provides on-site and surrounding land use conditions and land use policy requirements set forth by the County of San Bernardino.

EXISTING CONDITIONS

ON-SITE

The Project site encompasses approximately 62.43 acres (AC) and is situated along the northwest shore of Big Bear Lake, in the relatively undeveloped eastern portion of the community of Fawnskin, County of San Bernardino (refer to Exhibit 3-2, *Local Vicinity*). The Project site is generally bounded by Flicker Road to the north, Big Bear Lake to the south, Polique Canyon Road to the east, and Oriole Lane and Canyon Road to the west. The Project site is located immediately adjacent to broad expanses of contiguous forestland within the San Bernardino National Forest to the north and northeast. State Route 38 (North Shore Drive) traverses the southern portion of the property in an east/west orientation.

The property is an inholding within the boundaries of the U.S. National Forest, however, is not owned by the U.S. Forest Service (USFS) and therefore requires no permitting by the USFS.

OFF-SITE

Surrounding land uses involve a mixture of resource conservation, floodway, and single-family residential uses. The site is bounded by the following land uses:

North: Forest land and single-family residential uses are located along Flicker Road and Deer Trail Lane.

South: Big Bear Lake and single-family residential uses located to the south, fronting the north and south sides of State Route 38 (North Shore Drive).

East: Forest land and residential uses exist adjacent to the southeast corner of the Project site and east of Polique Canyon Road.

West: Vacant land and single-family residential uses are located to the west including residences along Canyon Road and further west, the greater Fawnskin community. Fawnskin is developed more extensively with single-family residential lots and boating facilities.

LAND USE POLICIES

SAN BERNARDINO COUNTY GENERAL PLAN

The San Bernardino General Plan was adopted on July 1, 1989 and was revised on November 22, 2001. The General Plan is organized according to four planning issues: Natural Hazards, Man-Made Hazards, Natural Resources, and Man-Made Resources. With this organizational style, the General Plan outlines the priority for the County in the type of resources that need to be preserved, and how these resources are to be preserved. Additionally, the General Plan identifies regional and subregional planning areas within the County.

NATURAL HAZARDS

This section identifies the conditions of potential danger or risk to life and/or property resulting from acts of nature. Four major groups of natural hazards are addressed in the General Plan including Geologic, Flood, Fire, Wind and Erosion. Mapping of these issues and application of the policies delineate areas subject to hazards. By identifying the areas of potential danger, development may be precluded thereby providing open space for health and safety purposes. The Natural Hazards section, in combination with the Man-made Resources issue and mapping overlays, satisfies the mandatory requirements of the Safety Element.

San Bernardino County is subject to many geologic hazards, including seismic activity (earthquake-induced phenomena such as fault rupture, ground shaking, liquefaction, seismically-generated subsidence, seiche, and dam inundation), landslide/mudslide (mudflow), non-seismic subsidence, erosion and volcanic activity. Each of these can affect property and existing or potential uses. The Project site is located in a geologic hazard area. Refer to the *Development Code* section below and Section 5.10, *Geology and Soils*, for further discussion relative to geologic conditions on the Project site.

A combination of climate, topography, vegetation and development patterns creates high fire hazard risks throughout the County, especially in the many areas of wildland/urban intermix located in foothills and mountainous areas Countywide. As development encroaches upon wildland areas, the potential for disastrous loss of watershed, structures, and life (human and wildlife) increases. The Project site is located in a high fire hazard area. Establishment of a coordinated program to condition development in some of these fire hazard areas has been adopted through the Foothill Hazards (Greenbelt) Overlays and the Mountain Fire Zone. The Foothill Hazard Overlays, the Mountain Fire Zone and additional high fire hazard areas are included in the Fire Hazard Overlay Mapping. Continuous evaluation and application

of Hazard Overlays and accompanying policies and standards for adequate services, facilities, mapping and developmental regulation are required as pressure for development increases countywide. Included in developmental regulation are requirements for minimum road widths (to provide adequate access for both fire fighting equipment and evacuating residents) and clearance around structures to prevent the rapid spread of fire from one structure to another. Refer to the *Development Code* section below and Section 5.3, *Public Utilities*, for further discussion relative to potential fire hazards on the Project site.

In response to state law, the Peakload Water Supply System Guidelines were developed (refer to Figure II-5 of the General Plan, *Peakload Water Supply System Guidelines*). These guidelines, designed to ensure an ample water supply, are the sum total of required fire flow, operational daily consumption and emergency storage.

Refer to Section 5.11, *Hydrology and Drainage*, for a discussion of site conditions relative to potential flood and erosion hazards.

MAN-MADE HAZARDS

The General Plan identifies conditions of potential danger or risk to life and health or property due to the acts of man and use of his technology. Three issues relevant to man-made hazards are addressed in this section including Noise, Aviation Safety, and Hazardous Waste/Materials. This section satisfies the mandatory requirements of the Noise Element.

Refer to Section 5.7, *Noise*, for a discussion of site conditions relative to potential noise hazards. Refer to Section 10.0, *Effects Found Not to be Significant,* for a discussion of site conditions relative to potential aviation safety and hazardous waste/materials hazards.

NATURAL RESOURCES

Natural resources are plentiful in San Bernardino County, with the exception of the water supply, which is at critically low levels in the mountain areas. These natural resources are a necessity for the quality of life that is desirable for residents and visitors in the County. This section establishes the concepts of carrying capacity, threshold levels of impact, renewable versus nonrenewable kinds of resources, ecological viability, and long-term versus short-term deleterious effects. Natural resources in the County are allocated to the following seven categories:

- Biological;
- Cultural/Paleontological;
- Air Quality;
- Water;
- Open Space/Recreation/Scenic;
- Soils/Agriculture; and
- Minerals.

Biological resources are defined in this Element as native species of plants and wildlife (resident and migratory). Some species are endangered or threatened with extinction and require intensive management for their preservation, while others are relatively abundant and require only the application of general conservation practices for their continued existence. This Element notes that the status of biological resources in the County is generally declining due to increased urbanization and encroachment into previously rural areas. Housing demand has spurred growth in all areas of the County affecting many species directly through habitat loss and indirectly through increased use of open space and recreational lands. The Project site contains biological resources, including certain species of plants and wildlife considered endangered or threatened. Refer to the *Development Code* section below and Section 5.8, *Biological Resources*, for further discussion relative to the biological resources on the Project site.

San Bernardino County contains a wealth of scenic resources, which have in many cases been recognized by local jurisdictions, the County, or state and federal agencies as worthy of special protection to preserve their aesthetic value. In recognition of the visual quality of the areas through which they pass, the County has designated certain roadways as scenic routes. In some instances, these roadways have also been designated as state scenic highways by the California Department of Transportation (Caltrans). In addition, the U.S. Forest Service has officially designated the length of the "Rim of the World Highway," which includes portions of Highways 138, 18, and 38, as a Scenic Byway. In the County, scenic highways are subject to additional land use and aesthetic controls under the County's Scenic Highway Overlay District.

The County has designated State Highway 38, which traverses the Project site, as a Scenic Highway. As a result, all development within the Scenic Corridor[1] would be subject to compliance with various policies and development standards. Refer to the *Development Code* section below and Section 5.4, *Aesthetics/Light and Glare*, for further discussion relative to Scenic Highway Overlay District requirements.

Refer to Section 5.6, *Air Quality*, and Section 5.9, *Cultural Resources*, for a discussion of site conditions relative to air quality and cultural/paleontological resources, respectively. Refer to Section 5.3, *Public Utilities*, and Section 5.11, *Hydrology and Drainage*, for a discussion of site conditions relative to water resources. Refer to Section 10.0, *Effects Found Not to be Significant,* for a discussion of site conditions relative to soils/agriculture and mineral resources.

MAN-MADE RESOURCES

The General Plan defines man-made resources as those characteristics and services, facilities and activities for which man is directly responsible, including the following:

- Wastewater Systems;
- Solid Waste Management;
- Transportation/Circulation;

[1] The General Plan defines the Scenic Corridor as that area which extends "200 feet on either side of the designated route, measured from the outside edge of the right-of-way, trail, or path."

- Energy/Telecommunications;
- Housing/Demographics; and
- Land Use/Growth Management.

This section describes the County residents, their housing, the services they use, what can be done with the land, and what infrastructure is needed to support development.

According to the *Transportation/Circulation* Section of the General Plan, there are approximately 3,620 miles of County maintained roads in County unincorporated areas, of which approximately 2,930 miles are paved. In addition, there are hundreds of miles of State highways and freeways. State Route 38 (North Shore Drive) traverses the southern portion of the Project site in an east/west orientation. This Section further notes the following with respect to the Project area:

> *"The County's Mountain region is served by a limited number of roads which climb steeply and curve sharply over a difficult landscape. Engineering and construction of new roads or improvements of existing roads can be very costly and time consuming. In several Mountain communities the existing roadways are already severely overcrowded and deteriorated by local and tourist traffic. In many cases populated areas are served by local roads without all-weather surfacing which may impair emergency vehicle access or escape routes during emergencies. Severe winter conditions can damage and slow traffic on State and County-maintained road systems. Because of the increased number and intensity of recreational, residential and commercial development planned for the Mountains, existing roadways will be even more severely burdened in the future. Furthermore, the steep terrain and physical environment of the Mountains make it difficult or impractical to build new roads or widen existing roads."*

The Transportation/Circulation maps utilize a computerized mapping system to illustrate a hierarchy of roads and highways. Road designations on the maps indicate the ultimate planned road facility. The circulation maps show basic categories of facilities (i.e., Freeways, Major Arterial Highways, etc.). These are broad classifications reflecting certain functional and technical differences. State Route 38 (North Shore Drive) is designated as a State Highway. State Highways are subject to special standards and conditions that do not fit into the categories described above.

Refer to Section 5.5, *Traffic and Circulation*, for further discussion regarding transportation/circulation resources. Refer to Section 5.3, *Public Utilities*, for a discussion regarding wastewater systems and solid waste management. Refer to Section 10.0, *Effects Found Not to be Significant,* for a discussion regarding energy/telecommunications and housing/demographics.

Land Use Element

The Land Use Element is the primary policy base for guiding the physical development of the privately owned unincorporated land in San Bernardino County. The Land Use Element correlates all land use issues into a set of coherent

development policies. The goals, policies, and actions of the Element relate directly to other elements and issues addressed in the General Plan. The Land Use Element policies relevant to the proposed Project are as follows:

> *LU-2 Because the County wants to promote and provide safe, attractive, varied residential areas convenient to public facilities, employment and shopping centers, the following policies/actions shall be implemented:*
>
> *(a) Require that the design and siting of new residential development meet locational and development standards that ensure compatibility with adjacent land uses and community character.*
> *(b) Allow varied approaches to residential development in order to foster a variety of housing types and densities and more efficient use of the land.*
> (c) *Adopt regulations . . . .*

The Land Use Element is divided into two sections: 1) Location, Distribution and Intensity of Land Uses, and 2) Growth Management. A description of the sections is provided below.

Location, Distribution, and Intensity of Land Uses

All private lands in the County are designated for specific land uses. This section specifies the purpose, locational criteria, building intensity standards, population density and the intended uses of each land use District.

Official Land Use Districts

The General Plan has established 17 Official Land Use Districts that are applied only to privately owned lands in the County. As illustrated on the Official Land Use Districts Map, the Project site is designated Rural Living (RL)-40. The intended use of the RL District is to provide sites for rural residential uses, incidental agricultural uses, and similar and compatible uses.

Official Land Use Districts for land uses adjacent to the Project site are outlined in Table 5.1-1, *Summary of Land Uses*, and described below.

Table 5.1-1
Summary of Land Uses

Existing Land Use		Official Land Use District	Improvement Level*
Project Site	Vacant	RL-40	IL1
North	Forest, Single-Family Residential (NW)	RC, RL-40, RS	IL1 & IL5
South	Big Bear Lake, Single-Family Residential (SE)	FW, RS	IL1
East	Vacant, Forest, Single-Family Residential (SE)	RC, RS	IL1 & IL5
West	Vacant, Single-Family Residential	PD-12/1, RS	IL1

* Refer to the *Improvement Standards* section below for definitions of Improvement Levels.

- Resource Conservation (RC): The RC District is intended to provide sites for open space and recreational activities, single-family homes on very large parcels, and similar compatible uses.

- Rural Living (RL): The RL District is described above.

- Single Residential (RS): The intended use of the RS District is to provide sites for single-family residential uses, incidental agricultural and recreational uses, and similar and compatible uses.

- Planned Development (PD): The intended use of the PD District is to provide sites for a combination of residential, commercial, industrial, agricultural, open space and recreation uses, and similar and compatible uses.

- Floodway (FW): The FW District is intended to provide sites for animal raising, grazing, crop production, and similar and compatible uses.

Improvement Standards

Additional public facilities and services are usually required when new residential, commercial or industrial uses are established. In several areas, major public service and facility deficiencies already exist. In order to ensure that future developments do not become fiscal liabilities to County residents, policies were developed to require that future development proceed at a pace commensurate with the provision of services.

The County recognizes that there is a direct relationship between the intensity of land uses and the amounts of facilities and services that are needed to support such uses. There are five levels of development intensity, ranging from very high density developments in urban areas, to very low density developments in very rural areas. The amount of infrastructure facilities and services required in areas with high density development is significantly more than that required in areas with low density development. Thus, the County established onsite and offsite improvement standards that are deemed essential in each of the five different levels of development intensity. This system of matching development intensity with essential improvements is referred to as the "Improvement Level" (IL) system. Five ILs were established to correspond with the five different intensity levels. Improvement Level 1 (IL1) is applied to very urban areas, while IL5 is applied to very rural areas. Improvement Levels are assigned to an area based on the long-term planned development and lifestyle commitment of the area. Future development is expected to provide the appropriate and applicable infrastructure facilities and services prior to, or in concert with anticipated or proposed development.

The designated Improvement Level for each area is illustrated on the Infrastructure/ Improvement Levels Overlay Map. According to this Map, the Project site has been designated IL1. Improvement Level 1 is applied to those areas planned for a higher intensity level of development. This may include large areas designated for commercial, industrial or multi-family residential uses, city spheres of influence areas planned for high-density uses, and higher-density single family residential uses. In most cases, IL1 is suitable in what may be considered the core areas of established

urban or urbanizing communities. The typical ultimate lot size in IL1 is less than 0.5 acre.

Figure II-15 of the San Bernardino County General Plan, *Improvement Standards – Mountain*, lists the required improvements for the five different levels of development intensity in the "Mountain" areas. According to Figure II-15, IL1 requires the following improvements:

- Legal and physical access
- Grants of Easements[1]
- Paved access
- Curbs and gutters
- Sidewalks
- Street lights at standard spacing
- Water purveyor
- Sewer[2] or Septics
- Drainage improvements[3]
- Paved dip section
- Fireflow

Notes
1 Includes necessary rights-of way for transportation and circulation, drainage and flood control facilities, and utilities.
2 Sewers shall be required as necessary by the EHS Department if necessary for reasons of health and safety.
3 The requirement will be waived in areas where a sub-regional plan and fee or other financing mechanism exists to provide necessary improvements. Provided, however, that the Transportation/Flood Control Department may require additional improvements if necessary for reasons of health and safety.

Improvement Levels for areas surrounding the Project site are outlined in Table 5.1-1, *Summary of Land Uses*, and described below.

- IL1: Refer to the description provided above.

- IL5: Level 5 is applied to areas with little or no development potential, and where only very sparse development is expected in the long term. These areas are typically in remote or inaccessible locations, or in relatively vast open space areas where severe environmental and physical constraints or lack of resources virtually preclude development. The typical ultimate lot size for IL-5 is greater than 20 AC.

According to Figure II-15 of the San Bernardino County General Plan, IL5 requires legal and physical access, grants of easements, and septic improvements.

Maps

The General Plan Text is supported by a series of thematic maps:

- The Official Land Use Districts Map;

- Composites of Overlays for:
  - Hazards/Noise;
  - Resources;
  - Transportation/Circulation; and
  - Infrastructure/Improvement Levels.

The Official Land Use Districts Map is a graphic representation of the location and distribution of the Official Land Use Districts that are applied in the County.

Overlays are applied to areas with special or unique physical characteristics. In such areas, special policies, and special development and performance standards may be established to protect public health and safety. The Hazards Overlay Maps depict areas of known hazards, both natural and manmade. They include the following:

- Geologic (Seismic and Landslide);
- Flood;
- Fire;
- Noise;
- Aviation Safety Areas; and
- Hazardous Waste.

The Project site is located within a Geologic Hazards Overlay District and a Fire Safety Overlay District. Areas considered geologically hazardous involve Alquist-Priolo Special Studies Zones and those areas susceptible to liquefaction and landslides. Areas considered fire hazardous involve those areas subject to wildland/urban intermix and high fire hazard as identified by the County Fire Warden including, but not limited to, areas previously designated in Mountain Fire Zone, and the Hillside and Foothill Fire Hazard Zones.

The Natural Resources Overlay Maps depict the following:

- Biological;
- Cultural;
- Paleontological;
- Open Space/Recreation/Scenic – Regional Trail Alignments, Open Space Areas, Wildlife Corridor Zones, Green Belt Areas, Buffer Areas;
- Important Farmlands;
- Agricultural Preserves;
- Mineral Resource Zones (MRZs); and
- Water Resources.

The Project site is located within a Biotic Resources Overlay District and a Scenic Resources Overlay District. Areas considered a biotic resource involve habitats of threatened, endangered and rare plants and wildlife and special habitat areas, as identified by Federal and State agencies and County Code. Areas considered a scenic resource include areas worthy of special protection to preserve their aesthetic value.

The General Plan Transportation/Circulation Maps utilize a computerized mapping system to illustrate the hierarchy of roads and highways. Refer to the *Man-Made Resources* section above for further discussion regarding these maps.

The combined Infrastructure/Improvement Level Maps show the general location of waste disposal sites (both County and non-County operated), sewage treatment plants, public schools (unincorporated areas only), homeless shelters in operation as of February 1988, and the Improvement Level (IL) areas 1 through 5, as described above.

Growth Management

The *Growth Management* section of the General Plan focuses on ways to monitor and manage future growth of the County in order to preserve valuable resources and maintain a high quality of life for all residents. This section includes: Growth Monitoring, Urban/Rural Service Boundaries, Intergovernmental Coordination, and Infilling. Refer to Section 6.3, *Growth Inducing Impacts*, for a discussion regarding growth management.

Regional/Sub-Regional Planning Areas

The General Plan identifies regional-subregional planning areas within the County. The County is comprised of three regions: the Valley, Mountain, and Desert, each with distinct geographic and physical characteristics. For planning purposes, these three regions were further divided into eight sub-regions: West Valley, East Valley, Mountain, Victor Valley, Barstow, Baker, Morongo Basin and Lower Colorado River. Each sub-region is divided into community-sized planning/specific plan areas. Profiles of each region, sub-region and community-sized planning/specific plan area are provided along with the policies unique to each area. The Project site is situated within the Mountain Region, the Big Bear Lake Planning Area, and the Bear Valley (BV) (Fawnskin) Community.

SAN BERNARDINO COUNTY DEVELOPMENT CODE

The San Bernardino County Development Code (Title 8) provides regulations governing the uses of land, buildings, structures, the height of buildings and structures, the sizes of yards about buildings and structures, as well as other matters.

Land Use Districts

The Land Use District maps illustrate the Official Land Use Plan, classifications, and boundaries of Land Use Districts. The Project site is classified as Rural Living-40 (RL) District (Section 84.0320). Permitted uses within the RL District include the following:

- Row, Field, Tree and Nursery Crop Cultivation;
- Single dwelling unit;
- Social Care Facility with six (6) or fewer clients; and
- Animal raising.

Overlay Districts

As specified in Section 85.0101, Overlay Districts are established to recognize and map environmental hazard constraints, environmental resource amenities, or community concerns, which should be taken into consideration when land development is being proposed. Overlay Districts establish regulations in addition to those imposed by the Land Use District. Overlay Districts are designated where development within a Land Use District is affected by or would affect such environmental hazard constraints, environmental resource amenities, or community concerns.

The Project site is located within the following four Overlay Districts: the Fire Safety (FRS) Overlay District; Geologic Hazard (GH) Overlay District; the Biotic Resources (BR) Overlay District; and the Scenic Resources (SR) Overlay District. The FRS Overlay District is created to provide greater public safety in areas prone to wildland brushfires, by establishing additional development standards for these areas. The FR Overlay District is created to provide greater public safety in areas prone to wildland brushfires, by establishing additional development standards for these areas. The FR Overlay District is divided into two review areas, each of which represents a different level of wildland hazard. A different set of requirements is applied in each review area. The provisions for these requirements are cumulative in that all of the requirements that are specified for Fire Safety Review Area 2 shall also apply to Fire Safety Review Area 1, in addition to those specified for only Fire Safety Review Area 1. The project site is located within Fire Safety Area 1 (FS1).

Fire Safety Review Area 1 (FR1). Fire Safety Review Area 1 includes wildland areas that are marginally developable, areas which are not likely to be developed, and the area of transition between wildlands and areas that are partially developed or are likely to be developed in the future. The area of transition is often characterized by an abrupt slope change. Natural hazards are prevalent throughout Area 1, especially in areas with natural ungraded slopes greater than thirty percent (30%). Area 1 includes areas of very high to extreme fire hazard.

- Fire Safety Review Area 2 (FR2). Land within Area 2 is relatively flat, and is either partially or completely developed, or, if it is not developed, is usually suitable for development. Present and future development within Area 2 is exposed to the impacts of wildland fires and other natural hazards primarily due to its proximity to Area 1.

Since Tthe Pproject site is located within a FS1 designated area, it is located within Fire Safety Review Area 2 (RR2), therefore would be subject to compliance with various requirements relative to construction, building separations, project design, and erosion and sediment control as specified in Section 85.020220, Area FR1 and FR2 Requirements *Building Standards for FS1*.

The GH Overlay District is created to provide greater public safety by establishing review procedures and setbacks for areas that are subject to potential geologic problems such as ground shaking, earthquake faults, liquefaction, and subsidence. According to Section 85.020410, *Geologic Reports*, a detailed geologic study is

required for the Project confirming the presence/absence of hazardous faults and if applicable, shall establish appropriate setbacks from active faulting. In portions of the Geologic Hazard Overlay District where slope stability is a concern, the geologic report shall evaluate landslides and other slope instabilities that could affect the project and identify recommendations for mitigation. For areas within the Overlay District where liquifaction is a concern, the geologic report shall evaluate the potential for liquefaction based upon anticipated ground shaking, historic groundwater levels and characteristics of alluvial materials. If the investigation determines that a potential for liquefaction exists, a geotechnical investigation may be required.

The purpose of the BR Overlay District is to implement General Plan policies regarding the protection and conservation of beneficial rare and endangered plants and animal resources and their habitats that have been identified within unincorporated areas of the County.

Section 85.030220, *Development Standards*, identifies the following standards for development within a BR Overlay District:

> *"When a land use is proposed or an existing land use is increased by more than twenty-five percent (25%) within a Biotic Resources Overlay District, the applicant shall have a report prepared identifying all biotic resources located on the site and those on adjacent parcels, which could be impacted by the proposed development. The report shall outline mitigating measures designed to reduce or eliminate impacts to the identified resource(s), and shall be submitted along with the application for the proposed development. The report shall be prepared by an appropriate expert such as a qualified biologist, botanist, herpetologist or other professional "life scientist."*
>
> *The conditions of approval of any land use application shall incorporate the identified mitigating measures to protect and preserve the habitats of the identified plants and/or wildlife."*

Refer to Section 5.8, *Biological Resources*, for a discussion regarding biological conditions on the Project site and the County's Plant Protection and Management Ordinance (Division 9 of the Development Code).

It is the intent of the SR Overlay District is to provide development standards that will protect, preserve and enhance the aesthetic resources of the County. Design considerations can be incorporated in many instances to allow development to coexist and not substantially interfere with the preservation of unique natural resources, roadside views and scenic corridors of such natural resources. It is also the intent of the SR Overlay District to implement state and federal programs and regulations regarding scenic highway routes. Section 85.030610, *Development Standards*, identifies various criteria used to evaluate a project's compliance with the intent of the overlay. The compliance criteria for the SR Overlay District generally involve the following issues:

- Building and structure placement;
- Review area;

- Access drives;
- Landscaping;
- Roads, pedestrian walkways, parking and storage areas;
- Above ground utilities;
- Grading;
- Timber harvesting;
- Storage areas; and
- Signage.

Refer to Section 5.4, *Aesthetics/Light and Glare*, for further discussion relative to SR Overlay District requirements.

Planning Areas

Section 86.040250, *Bear Valley Planning Area*, outlines the following development standards and land uses to replace or modify the corresponding development standards or land uses provided in the Land Use Districts and applicable Overlay Districts:

- Maximum Structure Height (feet): 35
- Minimum Lot Size (SF): 7,200
- Maximum Lot Coverage (building coverage): 40%
- Maximum Lot Dimensions (width to depth ratio)
  ≥10 AC: 1:4
  ≤10 AC: 1:3
- Minimum Lot Dimensions (width/depth in feet)
  interior lot: 60/100
  corner lot: 70/100
  lot size 1 acre+: 150 wide
- Front Yard Setback (feet): 15
- Site Yard Setbacks (feet): 20% of lot width, need not exceed 15
- Rear Yard Setbacks (feet): 15
- Street Side Yard Setbacks (feet): 15

Plant Protection and Management

Refer to Section 5.8, *Biological Resources*, for a discussion regarding the Project's compliance with the County's Plant Protection and Management Ordinance (Division 9 of the Development Code).

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

The Southern California Association of Governments (SCAG) is the Metropolitan Planning Organization for six counties in Southern California including: Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial. As the regional planning association, SCAG is mandated by the Federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality. Therefore, SCAG has developed the Regional Comprehensive Plan and Guide (RCPG) which is a general planning guide for the six counties to follow in: Strategy, Economy, Growth Management, Mobility (transportation), Air Quality,

Housing, Human Resources and Services, Finance, Open Space and Conservation, Water Resources, Water Quality, Energy, Hazardous Waste Management, Integrated Solid Waste Management and Plan Implementation. The proposed Project is not considered by SCAG to be regionally significant, and therefore, no additional review is necessary.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

The South Coast Air Quality Management District (SCAQMD) is the air pollution control agency for Los Angeles and Orange counties and parts of Riverside and San Bernardino counties. The SCAQMD is responsible for controlling emissions from stationary sources of pollution, such as large power plants, refineries and gas stations. In order to achieve the federally mandated five percent annual reduction goal, SCAQMD has developed and adopted the Air Quality Management Plan (AQMP). A 1997 AQMP was prepared by the SCAQMD and adopted by the District Governing Board on November 15, 1996. The 1997 Plan contains two tiers of control measures. Short and intermediate term measures are scheduled to be adopted through the year 2005. These measures rely on known technologies and other actions to be taken by several agencies that currently have the statutory authority to implement the measures. They are designed to satisfy the Federal Clean Air Act (CAA) requirement of Reasonably Available Control Technology (RACT) and the California Clean Air Act (CCAA) requirement of Best Available Retrofit Control Technology (BARCT). Refer to Section 5.6, *Air Quality,* for a discussion regarding the Project's consistency with the 1997 AQMP.

IMPACTS

SIGNIFICANCE CRITERIA

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains the Initial Study Environmental Checklist form which includes questions relating to land use and relevant planning. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this Section. Accordingly, a project may create a significant environmental impact if it causes one or more of the following to occur:

- Physically divides an established community (refer to Section 10.0, *Effects Found Not to be Significant*);
- Conflicts with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect (refer to Impact Statements 5.1-1 and 5.1-2); and/or
- Conflicts with any applicable habitat conservation plan or natural community conservation plan (refer to Section 5.8, *Biological Resources*).

Generally, the intermixing of land uses may result in land use incompatibilities. Land use compatibility impacts associated with land development are a factor of quality of

life issues, including, but not limited to traffic, noise, air quality and aesthetics (views/physical scale). While these may generally be perceived as subjective issues, the significance criteria detailed in each of the respective issues sections provides a basis for assessing land use compatibility impacts.

SAN BERNARDINO COUNTY GENERAL PLAN

5.1-1 *The proposed Project conflicts with the land use plan, policies and regulations set forth in the San Bernardino County General Plan. Analysis has concluded that impacts would be less than significant with approval of a Land Use District Change and Circulation Element Amendment (Transportation/Circulation Maps).*

As described in the *Existing Conditions* subsection, the San Bernardino County General Plan is organized according to four planning issues: Natural Hazards, Man-Made Hazards, Natural Resources, Man-Made Resources. Additionally, the General Plan identifies regional/subregional planning areas within the County.

The General Plan contains recommendations for development that pertain to the Project area (refer to the *Existing Conditions* discussion). The following analysis evaluates the Project's consistency/compliance with these recommendations:

NATURAL HAZARDS

As previously noted, four major groups of natural hazards are addressed under this issue area including Geologic, Flood, Fire, Wind and Erosion.

The Project site is located in a Geologic Hazards Overlay District. Refer to Section 5.10, *Geology and Soils*, for a discussion of potential Project impacts associated with geologic hazards.

The Project site is located in a Fire Safety Overlay District. Accordingly, Project development would be subject to compliance with various policies and standards for adequate services and facilities, including developmental regulation requirements for minimum road widths and clearance around structures. Additionally, the Project would be required to be adequately served by water supplies for domestic use and community fire protection in accordance with standards as determined by the County and the local fire protection agency/authority. A less than significant impact would occur in this regard following compliance with fire flow requirements and with the provision of adequate and reliable water storage for community fire protection. Refer to the *Development Code* section below and Section 5.3, *Public Services and Utilities,* for further discussion regarding potential fire hazards.

Refer to Section 5.11, *Hydrology and Drainage*, for a discussion of potential Project impacts relative to flood and erosions hazards.

MAN-MADE HAZARDS

The issues relevant to man-made hazards addressed in this section include Noise, Aviation Safety, and Hazardous Waste/Materials. Refer to Section 5.7, *Noise*, for a

discussion of potential impacts relative to noise hazards. Refer to Section 10.0, *Effects Found Not to be Significant,* for a discussion of potential impacts relative to aviation safety and hazardous waste/materials hazards.

NATURAL RESOURCES

This section identified seven categories of natural resources in the County, including biological and scenic resources. As previously noted, the Project site contains certain species of plants and wildlife considered endangered or threatened. Refer to Section 5.8, *Biological Resources*, for a discussion of potential impacts relative to biological resources and an evaluation of the Project's compliance with the Biotic Resources Overlay District Requirements.

State Highway 38 is a County designated Scenic Highway. Refer to Section 5.4, *Aesthetics/Light and Glare*, for a discussion of potential impacts relative to scenic resources and an evaluation of the Project's compliance with the Scenic Resources Overlay District Requirements.

Refer to Section 5.6, *Air Quality*, and Section 5.9, *Cultural Resources*, for a discussion of potential impacts relative to air quality and cultural/paleontological resources, respectively. Refer to Section 5.11, *Hydrology and Drainage*, and Section 5.3, *Public Services and Utilities*, for a discussion of potential impacts relative to water resources. Refer to Section 10.0, *Effects Found Not to be Significant,* for a discussion of potential impacts relative to soils/agriculture and mineral resources.

MAN-MADE RESOURCES

Transportation/Circulation. The Project proposes the relocation of approximately 2,498 linear feet of State Route 38 (North Shore Drive). State Route 38 (North Shore Drive) is classified as a State Highway. The Project would be required to construct this Highway in compliance with the special standards and conditions specified by Caltrans. As indicated in Section 5.5, *Traffic and Circulation*, implementation of the proposed Project would not overburden State Route 38 (North Shore Drive), as it would result in a less than significant impact to the Level of Service (LOS) for the Highway. Also, as the proposed highway improvements would occur in two phases, the Project would not impair emergency vehicle access or escape routes during emergencies. Highway construction would be subject to compliance with various development criteria and Caltrans standards relative to setbacks, prohibited direct access, the provision of left turn lanes (as necessary), shoulder width requirements, and pedestrian crossing requirements. The Project's proposed realignment of State Route 38 (North Shore Drive) would be subject to County of San Bernardino and Caltrans policies and standards. With the proposed amendment to the Transportation/Circulation Maps, the Project would be considered compatible and consistent with the General Plan. Thus, it is concluded that impacts would be less than significant.

Additionally, the Project proposes one loop road north of State Route 38 (North Shore Drive) providing access to 64 northerly residential lots and one loop road and five separate cul-de-sac drives south of State Route 38 providing access to 31 lakefront lots. These proposed improvements would be subject to compliance with

the General Plan's minimum standards and requirements for roads and access improvements for new developments. A less than significant impact is anticipated in this regard after compliance with the standards and requirements.

Refer to Section 5.5, *Traffic and Circulation*, for further discussion regarding potential impacts to transportation/circulation resources. Refer to Section 5.3, *Public Utilities*, for a discussion regarding potential impacts to wastewater systems and solid waste management. Refer to Section 10.0, *Effects Found Not to be Significant,* for a discussion regarding potential impacts to energy/telecommunications and housing/ demographics.

Land Use/Growth Management. The proposed Project would be considered compatible and consistent with the relevant Land Use Element policies (Policy LU-2) based on the following conclusions:

- Project development would meet the Locational Criteria and the Building Intensity Standards for the RS District as discussed below in the *Official Land Use Districts* section.

- The Project would be considered compatible with adjacent land uses and community character since it would be an extension of the existing land use pattern of RS Districts.

- The Project would allow for a variety of housing types since the proposed 95-lot residential subdivision would provide 92 residential lots ranging in size from 0.17 acres (7,292 square feet) to 2.11 acres (refer to Exhibit 3-4, *Site Plan – Tentative Tract #16136*).

Location, Distribution, and Intensity of Land Uses

Official Land Use Districts

As previously noted, the Project site is currently designated RL-40 (Rural Living). The Project proposes a Land Use District Change from RL-40 to Single Residential (RS). The RS District is described as follows:

- Single Residential (RS): The intended use of the RS District is to provide sites for single-family residential uses, incidental agricultural and recreational uses, and similar and compatible uses. The purpose of the RS District is as follows:

    - To provide areas for single-family homes on individual lots.

    - To provide areas for accessory and non-residential uses that complement single residential neighborhoods.

    - To discourage incompatible non-residential uses in single-family residential neighborhoods.

The Locational Criteria for the RS District are as follows:

- Areas that are not adjacent to Regional Industrial or Agriculture District except where the ultimate minimum residential parcel sizes shall be 1.0 acre or larger.

- Areas that are within one mile of major arterial and/or existing major public transit route.

The Building Intensity Standards for the RS District are as follows:

- Maximum Housing Density — 4 DU/AC
- Minimum Net Parcel Size — 7,200 SF
- Minimum District Size — 10 AC
- Maximum Building Coverage — 40%
- Maximum Building Height — 35 feet

Development of the proposed Project would be consistent with the standards and criteria established for the RS District. The Project would be consistent with the purpose and intended use of the RS District, since it proposes development of 92 single-family residential lots, and a boat dock and parking lot (for use by residents), which would be considered incidental recreational and accessory uses that would complement the proposed residences. The Project would be consistent with the Locational Criteria for the RS District since the Project site is not located adjacent to a Regional Industrial or Agriculture District and is located within one mile of State Route 38 (North Shore Drive), a major arterial.[2] The Project would be consistent with the Building Intensity Standards for the RS District regarding maximum housing density, minimum net parcel size and minimum District size since the Project proposes a maximum of four DU/AC, a minimum net parcel size of 7,292 SF and a Project area (District) exceeding 10 AC (the Project site is approximately 62.43 AC). The proposed residential lots would be sold individually and development of lots and construction of dwellings would be by custom design. Therefore, future lot development would be required to comply with the 40 percent maximum building coverage and the 35-foot maximum building height. With the proposed change to the Official Land Use District (from RL-40 to RS), the Project would be considered compatible and consistent with the General Plan. Additionally, it should be noted that the Project can be considered a reasonable extension of the existing land use pattern in the surrounding area. As outlined in Table 5.1-1, *Summary of Land Uses*, existing RS Districts are located north, south, east and west of the Project site. A less than significant impact would occur with the proposed Official Land Use District Change.

Improvement Standards

As previously noted, the Project site has been designated IL1, thus, would be required to provide each of the improvements specified in Figure II-15 of the San Bernardino County General Plan, *Improvement Standards – Mountain*. The Project would be subject to implementation of the IL1 standards according to detailed

[2] The Project site is actually traversed by State Route 38.

County guidelines. With implementation of the required improvements, the Project would provide the appropriate and applicable infrastructure facilities and services essential to the proposed residential uses. Additionally, the Project would represent a reasonable extension of the existing pattern of infrastructure facilities and services in the surrounding area. As outlined in Table 5.1-1, *Summary of Land Uses*, existing IL1 areas are located north, south, east and west of the Project site. A less than significant impact is anticipated in this regard.

Maps

The Project proposes a Land Use District Change from RL-40 to Single Residential (RS) District. The Official Land Use Districts Map would require an amendment reflecting the property's District Change to RS. As noted in the *Official Land Use Districts* discussion above, a less than significant impact would occur with the proposed Land Use District Change.

According to the Hazards and the Natural Resources Overlay Maps, the Project site is located within a Geologic Hazards Overlay District, a Fire Hazards Overlay District, a Scenic Resources Overlay District, and a Biotic Resources Overlay District. Accordingly, the Project would be subject to compliance with special policies, and special development and performance standards intended to protect public health/safety and natural resources. Refer to the *Development Code* section below for a discussion regarding the Project's compliance with policies and standards required in Overlay Districts.

The Project proposes an amendment to the Transportation/Circulation Maps, changing the alignment of State Route 38 (North Shore Drive). As noted in the *Man-Made Resources* discussion above, a less than significant impact would occur with the proposed Transportation/Circulation Maps Amendment.

No change to the Infrastructure/Improvement Level Maps is proposed by the Project and no impact would occur in this regard.

Regional/Sub-regional Planning Areas

The Project site is located within the Mountain Region, the Big Bear Lake Planning Area, and the Bear Valley (BV) (Fawnskin) Community. Refer to the *Planning Areas* Section below for a discussion of the Project's consistency with development criteria for the BV Community.

SAN BERNARDINO COUNTY DEVELOPMENT CODE

5.1-2 *The proposed Project conflicts with the land use plan, policies and regulations of the San Bernardino County Development Code. Analysis has concluded that a less than significant impact would occur with approval of a Land Use District Change, Circulation Element Amendment and Conditional Use Permit.*

Land Use District Change

The Project proposes a Land Use District Change from Rural Living (RL) District (Section 84.0320) to Single Residential (RS) District (Section 84.0325). According to Section 83.020110, *Findings*, a General Plan Land Use District Change requires that the following be true:

- The proposed land use District change is in the public interest, there will be a community benefit, and other existing and permitted uses will not be compromised.

- The proposed land use District change is consistent with the goals and policies of the General Plan, and will provide a reasonable and logical extension of the existing land use pattern in the surrounding area.

- The proposed land use District change does not conflict with provisions of this Code, or any applicable specific plan.

- The proposed land use District change will not have a substantial adverse effect on surrounding property.

These criteria are true for the proposed Project based on the following conclusions:

- Implementation of the proposed Project would be considered an extension of the existing land use pattern (i.e., surrounding single-family residential uses). Further, while the Project is large in comparison to an individual lot development, it offers the opportunity for a cohesively planned development, which would be subject to compliance with the County's administrative design guidelines, as well as the development standards specified for the RS District. Also, the Project would be required to comply with the mitigation measures specified in this EIR to avoid or lessen potential Project impacts. The measures identified in this document have taken into consideration the property's setting, opportunities, and constraints. Following compliance with the specified development standards, design guidelines, and mitigation measures, Project implementation would not compromise existing single-family residential and rural land uses.

- As discussed above, the proposed Project is considered consistent with the relevant Land Use Element goals and policies. Also, the proposed single-family residential development is considered a reasonable extension of the existing land use pattern in the surrounding area since existing RS Districts (i.e., single-family residential developments) are located north, south, east and west of the Project site (refer to Table 5.1-1, *Summary of Land Uses*).

  Compliance with the established development standards, design guidelines, and mitigation measures, would improve the interface between rural and residential uses, where appropriate.

- Analysis provided in this section (i.e., the *Development Code* section) has concluded that the proposed Project would not conflict with the provisions of

the San Bernardino County Development Code with approval of a Land Use District Change, Circulation Element Amendment and Conditional Use Permit.

- The proposed Land Use District Change would not have a substantial adverse effect on surrounding properties following compliance with the established development standards, design guidelines, and mitigation measures. The Project is considered compatible with the surrounding land uses based on two factors: the Land Use District Change proposed by the Project would meet each of the criteria required for a Land Use District Change; and the Project's proposed single-family residential development would be an extension of the existing land use pattern of RS Districts (single-family residential).

Permitted Uses and Development Standards

According to Code Section 84.0325, Single Residential (RS) District, permitted uses within the Single Residential (RS) District shall include the following:

- Row, Field, Tree and Nursery Crop Cultivation;
- Single dwelling unit;
- Social Care Facility; and
- Accessory Uses specified by Chapter 5 (of Title 8, Division 4).

Land uses subject to department review/conditional use permit include the following:

- Mobilehome Park;
- Additional uses as specified by Chapter 4 (of Title 8, Division 4); and
- Animal raising.

According to Section 84.0401, *Additional Use Criteria*, the land uses listed in Section 84.0410 shall be allowed in any Official Land Use District subject to a Conditional Use Permit when one or more of the following criteria have been met:

- The location of the land use is determined by other land uses which are directly supported by the proposed use; or

- The land use is part of the community or regional infrastructure; or

- The location of the proposed use is determined by the location of raw materials in their natural state such as mineral deposits, natural vegetation and energy sources; or

- The character of the proposed use is such that it requires a remote location away from other land uses; or

- The land use is deemed essential or desirable to the public convenience or welfare.

The Project proposes single-family residential uses that are permitted within the RS District. The Project also proposes a Marina boat dock and parking lot, which may be permitted within the RS District, subject to an approved CUP. According to Section 84.0410(c) and (q), *List of Additional Uses*, the proposed boat dock and parking lot would be allowed in any Official Land Use District subject to the criteria noted above (Section 84.0401). The proposed boat dock and parking lot would be conditionally permitted since they meet two of the criteria listed above: their location would be determined by the proposed residential uses they would support and the land use is deemed essential or desirable to the public convenience or welfare. It is further noted, as discussed in Section 5.2, *Recreation*, that the marina dock/boatslip facilities are subject to requirements set forth by the Big Bear Municipal Water District, County of San Bernardino, and City of Big Bear Lake.

The following property development standards apply to all land uses within the RS District:

- Maximum Structure Height (feet): 35
- Minimum Lot Size (SF): 7,200
- Maximum Lot Coverage (building coverage): 40%
- Maximum Lot Dimensions (width to depth ratio)
  - ≥10 AC: 1:4
  - ≤10 AC: 1:3
- Minimum Lot Dimensions (width/depth in feet)
  - ≥1 AC: 150/150
  - ≤1 AC: 60/100
- Front Yard Setback (feet): 25
- Side Yard Setbacks (feet): 10 & 5
- Rear Yard Setbacks (feet): 15
- Street Side Yard Setbacks (feet):
  - Street type: Local: 15
  - Street type collector/wider: 25
- Maximum Housing Density (DU/AC): 4
- Minimum District Size (AC): 10

Based on the proposed site plan (refer to Exhibit 3-4, *Site Plan*), the proposed Project would be consistent with the property development standards for the RS District regarding minimum lot size, and maximum and minimum lot dimensions, since the Project proposes a minimum lot size of 7,292 SF and the proposed residential lots meet the maximum and minimum lot dimensions (refer to Exhibit 3-4, *Site Plan*). Additionally, the proposed Project would be consistent with the property development standards regarding maximum housing density and minimum District size, since the Project proposes a maximum of 4.0 DU/AC and the Project area (District) exceeds 10 AC (the Project site is approximately 62.43 AC). The proposed residential lots would be sold individually and development of lots and construction of dwellings would be by custom design. Through the site plan review process, future lot development would be required to comply with each of the development standards for the RS District including the 35-foot maximum structure height, 40 percent maximum lot coverage, and the front, side, rear, and street side yard setbacks. Additionally, future development would be required to comply with the County's administrative design guidelines and mitigation measures identified in this

EIR to avoid or lessen potential impacts. A less than significant impact would occur in this regard.

Overlay Districts

The Project site is located within a Fire Safety (FR) Overlay District and within Fire Safety Review Area 1 (FR1). Therefore, the Project would be subject to compliance with various requirements relative to construction, building separations, project design, and erosion and sediment control, as specified in Section 85.020220,*Building Standards for FS1.* Also, the proposed Project, including future residential lot development, would be subject to compliance with the County's design guidelines relative to fire protection (i.e., access, fire flow, safety standards, building setbacks, fuel modification areas, roof coverings, and chimneys). A less than significant impact would occur in this regard following compliance with the specified requirements.

The Project site is located within a Geologic Hazard (GH) Overlay District. The proposed Project is in compliance with Section 85.020410, *Geologic Reports.* As noted in Section 5.10, *Geology and Soils, Geomatrix Consultants, Inc.* has prepared a Geology and Soils Study of the Project site (refer to Section 15.7, *Geology/Soils Analysis*). The Study has confirmed the absence of faults and marsh areas on the Project site. The Project would be required to comply with various development standards (set forth in Section 5.10 of this EIR). A less than significant impact would occur in this regard after compliance with the specified development standards.

The Project site is located within a Biotic Resources (BR) Overlay District. The proposed Project is in compliance with the development standards for this District. As noted in Section 5.8, *Biological Resources*, BonTerra Consulting has prepared a Biological Resources Assessment of the Project site. The Assessment identifies biotic resources located on the Project site and on adjacent parcels that could be impacted by the proposed development. The report outlines mitigation measures intended to avoid or lessen impacts to the identified resource(s). The conditions of approval for the proposed Project would be required to incorporate the identified mitigation measures. A less than significant impact would occur in this regard.

The Project site is located within a Scenic Resources (SR) Overlay District. Thus, the Project would be subject to compliance with various compliance criteria as specified in Section 85.030610, *Development Standards.* Refer to Section 5.4 *Aesthetics/Light and Glare*, for an analysis of the Project's compliance with these criteria.

Planning Areas

The proposed Project would be consistent with the development standards for the Bear Valley Planning Area regarding minimum lot size, and maximum and minimum lot dimensions since the Project proposes a minimum lot size of 7,292 SF and the proposed residential lots meet the maximum and minimum lot dimensions. The proposed residential lots would be sold individually and development of lots and

construction of dwellings would be by custom design. Through the site plan review process, future lot development would be required to comply with the 35-foot

maximum structure height, 40 percent maximum lot coverage, and the front, side, rear, and street side yard setbacks. Additionally, future development would be required to comply with the County's administrative design guidelines and mitigation measures identified in this EIR to avoid or lessen potential impacts. A less than significant impact would occur in this regard.

CUMULATIVE

5.1-3 *The proposed Project, combined with other future development, would increase the intensity of land uses in the area. Analysis has concluded that impacts are less than significant and no mitigation is required. Projects are evaluated on a project-by-project basis in accordance with the San Bernardino County General Plan and Development Code.*

Development of the site, as proposed, would not result in any cumulative significant land use impacts, as other projects are implemented in the area. Each new project would undergo the same review process, as the proposed Project, in order to preclude potential land use compatibility issues and planning policy conflicts. It is assumed that cumulative development would progress in accordance with the City of Big Bear Lake and County of San Bernardino General Plan and Development Code. Each project would be analyzed independent of other land uses, as well as within the context of existing and planned developments, to ensure that the goals, objectives and policies of the General Plans are consistently upheld.

MITIGATION MEASURES

This section directly corresponds to the identified impact statements in the impacts subsection.

SAN BERNARDINO COUNTY GENERAL PLAN

5.1-1 No mitigation measures are recommended.

SAN BERNARDINO COUNTY DEVELOPMENT CODE

5.1-2 No mitigation measures are recommended.

CUMULATIVE

5.1-3 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

No unavoidable significant impacts related to Land Use and Relevant Planning have been identified following compliance with the San Bernardino County General Plan and Development Code policies and standards.

5.2 RECREATION

This Section focuses primarily on potential impacts resulting from the loss of on-site trails and dirt roads, which are used for hiking and access, and the increased use of the Big Bear Lake facilities. Permit requirements are identified to reduce the significance of potential impacts. Impacts to other recreational facilities in the local area are also addressed.

EXISTING CONDITIONS

ON-SITE RECREATION

Existing on-site recreation activities include picnicking, bird watching, fishing, walking and bicycle riding. Walkers and outdoor enthusiasts (including photographers and hikers) utilizing the on-site trails/footpaths for exercise and/or recreational activities, enjoy views of the on-site Jeffrey pine trees and Big Bear Lake to the south, as well as observing on-site flora and fauna species (refer to Section 5.8, *Biological Resources*). A variety of waterfowl can be also observed along the lakefront, including Great Blue Herons and Ospreys. The site can be used to access fishing locations at the lakefront. The site also provides access to the San Bernardino National Forest to the north. Although the Project site provides numerous recreational opportunities, public access to the site and lake is not assured, since the Project site is private property.

OFF-SITE RECREATION

The Big Bear Lake area includes several unincorporated communities and the City of Big Bear Lake. The Lake area is considered a premier recreational and vacation resort area of Southern California. Traditional winter recreational activities in the area include skiing and snowboarding. The area is home to the Bear Mountain and Snow Summit ski resorts. During the summer, the Big Bear Lake area provides visitors and residents with numerous camping, picnicking, fishing, boating, bird watching, horseback riding and bicycling opportunities. Additionally, during the summer, the ski resorts open their trails for mountain biking.

The Moon Camp project site is located in the Community of Fawnskin. The Fawnskin area supports visitors and residents with the provisions of lodging, restaurants, boat docks, fishing, bicycling paths, campgrounds and picnic areas. The Serrano Campground is located southeast of the project site and the Lake provides various boating and fishing recreational opportunities for the Fawnskin area. The lake's waters are utilized by recreational boaters, as well as smaller recreational craft (jet skis, kayaks, etc.). Recreational activities occur daily on the lake, with greater use on weekends, and the highest use occurring on major spring and summer holiday weekends.

BIG BEAR LAKE

Regulatory Authority. The County of San Bernardino has jurisdiction over the entire bottom of the Lake. The Big Bear Municipal Water District owns and therefore has

jurisdiction that extends to the high water line of the Lake. The Big Bear Municipal Water District (MWD) has authority to regulate recreational activity on the Lake's surface.

Public Access to Lake. According to the Big Bear Municipal Water District Management Plan, dated August 3, 2000 (Revision), to ensure that public access to the Lake is preserved, the Big Bear MWD has constructed two public boat launch ramps and improvements at the Stanfield Marsh that includes a parking and viewing location and boardwalk for public access. Additional public access to the lake is provided on property along the north shore, which is owned by the Forest Service. Also, there are eleven commercial marinas providing access to the Lake. The Forest Service has constructed the Alpine Pedal Path Bike Trail along the north shore of the Lake, which extends from Stanfield Cutoff, through the MWD East Boat Ramp, to the Solar Observatory, which is immediately to the east of the Moon Camp site. The MWD also owns and operates a recreational vehicle park adjacent to their administrative offices. As previously stated, since the Project site is private property, public access to the lake is not assured.

Recreational Lake Activity. As previously stated, the MWD regulates recreational activities and facilities on the Lake. The MWD provides an annual review of Lake use data, including types of boating activity, shoreline use and parking at the public launch ramps, in order to determine if there is a need to expand or develop additional recreational facilities. When an analysis of data indicates that the Lake, ramp or shoreline use has reached a level where current facilities cannot meet the public demand, the District examines solutions to the problem.

As referenced in the MWD Management Plan, there is an average of 2,710 usable Lake acres between April and October, which is the peak boating season. In May of 1984, the District approved a lake carrying capacity of 1,000 boats. At that same time, it was also determined that the maximum number of dock slips which may be available on the Lake at full build-out is 5,200. The weekend use factor of those docks was determined to be nine percent. Based on that calculation, the maximum number of boats from docking facilities on a weekend is 468. This allows for an additional 632 boats to be launched from the public launch ramps or private marinas before the 1,000 boat maximum would be reached. As of August 2000, mooring availability on the Lake was less than 2,500, which if multiplied by the nine percent factor, equates to less than 255 boats using the docking facilities. In 1999, to ensure that the number of docks on the Lake would not eventually contribute to an exceedence of the number of allowable boats on the Lake, the District reduced the number of allowable moorings for lakefront businesses.

According to the MWD Water Management Plan, during the 1996 season, the average daily use of boats was 262 during the summer peak season. The 1997 average was 199 boats, the 1998 average number of boats was 208 and the 1999 average was 199. As of 2000, boat fishing accounts for approximately 50 percent of Lake boating use. Each summer, the three major holiday weekends (Memorial Day, July 4th and Labor Day) always results in increased lake usage. Although safety problems have not occurred as a result of the increased Lake usage on the holiday weekends, parking has been a problem on peak days at public launch ramps.

The MWD Water Management Plan states that shoreline use for picnicking, fishing and hiking averaged 616 people per day in the 1996 summer season, 511 people in 1997, 586 in 1998 and 493 in 1999. Shore fishing is most popular in April and May when the shallow areas are relatively free of aquatic plants. Due to aquatic plants, the most popular fishing areas in the summertime include the dam area, Windy Point, Fisher Point, Juniper Point and Dana Point. The two piers, at each of the District's public launch ramps have improved fishing access along the north shore of the Lake.

IMPACTS

SIGNIFICANCE CRITERIA

Appendix G, *Initial Study Checklist*, of the California Environmental Quality Act (CEQA) Guidelines includes checklist questions relating to recreation. A project would potentially create a significant impact if it caused one or more of the following to occur:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated (refer to Section 10.0, *Effects Found Not To Be Significant*);

- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment (refer to Impact Statement *5*.2-1).

Potential impacts are grouped below according to topic. The numbered mitigation measures at the end of this Section directly correspond with the numbered impact statement.

EXPANSION AND/OR CONSTRUCTION OF RECREATIONAL FACILITIES

5.2-1 *Implementation of the Moon Camp project involves the construction or expansion of recreational facilities which may have an adverse physical effect on the environment. Compliance with the Big Bear MWD standards and permit requirements would reduce impacts to a less than significant level.*

The Moon Camp Project proposes to construct approximately 100 boat docks (dependent upon demand) at the southwest corner of the project site, along the north shore of Big Bear Lake. The boat docks would be accessible through a gated entrance and available to residents of the Moon Camp tract.

Per an agreement executed in 1974, Big Bear Properties acquired the rights to certain commercial boat landing (marina) permits. The rights for two of these permits have yet to be exercised and were transferred to Forest Properties. According to the MWD, one of the two permit rights have been assigned to the Moon Camp

Development.[1] Since the Applicant wishes to operate a private dock club for the use of homeowners and their tenants and guests, the project would be required to exchange the marina permit for the right to obtain a "Yacht Club" dock license.[2] Dock privileges are normally granted only to lakefront properties, however, the yacht club license would allow a dock slip for each single-family dwelling parcel, plus additional slips equal to 10 percent of the total number of parcels. In this case that formula would restrict the dock system to a maximum of 101 slips (92 lots + (92 lots x 10%) = 101 slips). The number of lakefront homeowners who exercise their individual dock privileges could reduce this number. Thus, the proposed 100 dock slips would be consistent with the provisions set forth for Yacht Clubs by the District.

As stated in the existing conditions, 1,000 boats is the carrying capacity of Big Bear Lake and the maximum number of dock slips on the Lake would be 5,200. The 100 proposed dock slips would not surpass the total amount of dock slips allowed on the Lake. The 100 dock slips, if multiplied by the weekend use factor of nine percent, would add approximately nine boats per day to the daily average number of boats using the lake. This increase in boat usage on the lake would not surpass the 1,000 boat carrying capacity of the Lake. Furthermore, according to the Big Bear Municipal Water District Management Plan, current lake use statistics show that it is unlikely that in the foreseeable future, the District would need to consider any restriction on the number of boats on the Lake. In fact, as long as the parking facilities remain at the current level, use of the Lake is somewhat self-restricting.

The Big Bear Municipal Water District has identified three areas of concern with implementation of the proposed marina facilities associated with the Moon Camp project. First, a mooring plan for high and low water conditions must be submitted and reviewed to ensure that dock placement is consistent with District regulations. This would allow for a Dock System and License Agreement to be obtained. Second, any construction activity that may occur below the high water line (i.e., seawall, launch ramp, headwalk, dredging or slope modification, etc) would require a Shorezone Alteration Permit. Third, the District would need to receive a copy of the Storm Water Pollution Prevention Plan (SWPPP), approved by the Water Resources Control Board, to ensure that the Lake is adequately protected from pollutants before, during and after project construction (refer to Section 5.11, *Hydrology and Drainage*). This is especially critical as the District is currently involved with the Santa Ana Regional Water Quality Control Board in the Total Maximum Daily Load process for Big Bear Lake.

In conclusion, the proposed project would involve construction of marina facilities that may have an adverse impact on the physical environment. However, in consideration of the standards set forth by the Big Bear Municipal Water District, potential impacts to the physical environment created by the construction of recreational facilities are concluded to be less than significant.

[1] Source: Written Correspondence with Sheila Hamilton, General Manager, of the Big Bear Municipal Water District. February 28, 2002.

[2] Section 4.05, *Yacht Clubs*, of Resolution No. 2001-16 of the Big Bear Municipal Water District establishes regulations that govern yacht clubs.

PUBLIC ACCESS

5.2-2 *Implementation of the Moon Camp project would ~~not~~ affect public access along the north shore of Big Bear Lake. Mitigation requiring dedication of an easement along the south side of North Shore Drive has been incorporated. ~~The Project site is Private Property. Affects on public access are concluded as less than significant.~~*

The Moon Camp Project would include 31 residential/numbered lots south of the realignment of North Shore Drive. Additionally, the marina facilities, inclusive of Lot "C" would be located south of North Shore Drive. Lot "C", consisting of approximately 19,683 square feet (0.45 acres), would be the gated entrance to the marina facilities. Lot "C" would be situated between the "high water line" and the roadway improvements at the southwestern portion of the project site. The Lot "C" marina access ramp would affect public access from west to east along the shoreline of the Lake.

The County of San Bernardino General Plan Goal C-54 states the intention to "provide public access to all water bodies and water courses." Furthermore, Policy/Action OR-48 states that, "Because the County seeks to improve the ability of the public to enjoy water-related recreation, the County shall seek to improve public access to rivers, lakes, creeks, lakes and other bodies of water." Additionally, Policy/Action OR-49 states that "Because public access to water for recreational uses is important to the County, easements and dedications allowed in the Subdivision Map Act to acquire access to lakes, streams, public lands and other locally and regionally significant natural features shall be required for all new development." ~~However, since the Project site is private property, public access is not assured~~. As the project abuts existing homes to the east and the proposed Marina Point Development to the west, ~~P~~public access to the lakeshore would be maintained below the high water line of the lake.~~maintained at the eastern and western boundaries of the site~~. Public access to the lakeshore also continues to be maintained at other locations along the perimeter of the lake. However, since the Project site is private property, public access is not assured.

~~It is further noted that~~ Although the U.S. Forest Service has indicated that there are no current plans to extend the Alpine Pedal Path through the project area, as a result of redesign of portions of the project area, south of North Shore Drive, a pedal path easement could be established. Thus, mitigation incorporating an easement has been incorporated for the project, to be conditioned, prior to recordation of a map. ~~Thus, it is concluded that access is provided to the lakeshore in close proximity to the project site resulting in a conclusion of less than significant impact.~~

CUMULATIVE

5.2-3 *Cumulative development may result in increased use of existing recreational areas/facilities, thereby creating the potential for physical deterioration. Additionally, cumulative development may include recreational facilities (i.e., marina) that have the potential to result in physical impacts on the environment. Mitigation measures necessary for*

reducing impacts are addressed on a project-by-project basis to reduce impacts to a less than significant level.

The proposed Project would contribute to the cumulative need for more recreational park space and related facilities. Although, the proposed Project would increase the use of existing facilities, the proposed project would also create a new recreation facility (marina). Cumulative projects would be required to mitigate incremental impacts to Countywide recreational facilities, resulting in a less than significant impact.

Additionally, as stated in Impact Statement 5.2-1, Big Bear Lake has been identified as a primary recreational entity associated with the proposed project. According to the Big Bear Municipal Water District, the Lake has a maximum boat carrying capacity of 1,000 boats. The approximately 100 boat slips associated with the Moon Camp project and the approximately 175 boat slips at the Cluster Pines project would not surpass the boating capacity or the dock slips capacity of the Lake at full build-out.

MITIGATION MEASURES

The following mitigation measures directly correspond to the identified impact statements in the Impacts discussion.

EXPANSION AND/OR CONSTRUCTION OF RECREATIONAL FACILITIES

5.2-1 No mitigation measures are recommended.

PUBLIC ACCESS

5.2-2 ~~No mitigation measures are recommended.~~ The proposed project shall be conditioned to incorporate a pedal path easement along the south side of North Shore Drive, prior to map recordation.

CUMULATIVE

5.2-3 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

No significant impacts related to Recreational facilities have been identified in this Section.

5.3 PUBLIC SERVICES AND UTILITIES

This Section is based, in part, on correspondence from public service and utility agencies (refer to Appendix 15.12, *Correspondence*) and references which include a, the Geohydrologic Investigation of the Moon Camp Area (GSS 2000 report), prepared by Geoscience Support Services, Inc. (GSS) (July 2000), the Focused Geohydrologic Evaluation of the Maximum Perennial Yield of the North Shore and Grout Creek Hydrologic Subunit Tributary Subareas (GSS 2003 report), prepared by GSS (December 2003), the Moon Camp Water Feasibility Study prepared by So & Associates Engineers, Inc. (March, 2002), and the County Service Area 53 Sewer Study by So & Associates Engineers, Inc. (July, 2001) (refer to Appendix 15.12, *Correspondence*). Public services include fire protection, police protection, schools and libraries. Utilities and service systems include water, wastewater, solid waste, electricity and natural gas services. This Section includes an Existing Conditions discussion which provides background information necessary to understand potential impacts of the proposed Project. Mitigation measures are identified in an effort to reduce potential impacts to less than significant levels.

EXISTING CONDITIONS

FIRE PROTECTION

The County of San Bernardino Fire Department provides fire protection and emergency medical services to the Fawnskin area. The Project area is served by County Fire Station No. 49, located in Fawnskin, at 39188 Rim of the World Drive (approximately ¾ of a mile westerly of the site). Two permanent personnel (one of the two is a paramedic) and approximately eight to ten volunteer fire fighters serve Station 49. Mutual aid agreements exist with the City of Big Bear Lake and Big Bear City. These agreements provide first-response in the event additional equipment and manpower is necessary during a multi-alarm fire or in the event that these stations could provide first alarm response with the closest available equipment.

The Insurance Service Organization (ISO) is a private insurance research group that periodically assesses the degree to which fire threatens geographic areas. This rating is based on the type of vegetation or structures present, climate, and the availability of fire protection services. The ISO uses a scale of I (best protection or lowest threat) to 10 (least protection or higher threat). Presently, the Community of Fawnskin has an ISO rating of 9.

The Project site is located within a Fire Safety (F~~R~~S) ~~Overlay District~~ Area ~~2~~1 (F~~R2~~S1), as designated by the County of San Bernardino General Plan Hazard Maps. FS1 areas are subject to compliance with various requirements relative to construction, building separations, project design, and erosion and sediment control as specified in Section 85.020220, ~~Area FR1 and FR2 Requirements~~ *Building Standards for FS1*, of the County Development Code. The provisions of the F~~R2~~S1 District apply to all phases of development. Refer to Section 5.1, *Land Use and Relevant Planning*, for further discussion of Fire Safety Overlay District requirements.

POLICE PROTECTION

Police protection to the Community of Fawnskin for both crime and traffic services is provided by the San Bernardino County Sheriff's Department. The City of Big Bear Lake and Big Bear City also provide police protection services to the Community, as needed. The mountain communities in the area have volunteer support of law enforcement through an active Search and Rescue Team, Citizen's Patrol and Neighborhood Watch Programs.

The Big Bear Sheriff's Station is located at 477 Summit Boulevard in the City of Big Bear Lake, approximately 6.0 miles east of the Project site. The station serves as host to the City of Big Bear's contract law enforcement services, personnel, as well as staff to serve the unincorporated area. The station also houses a Type I jail facility within the County building. The Department has nine patrol duties, 24-hour coverage personnel assigned to unincorporated areas, one detective and support personnel.

The Big Bear Sheriff's Station provides police protection services to a population of approximately 15,800 persons in the unincorporated San Bernardino County areas of Big Bear Valley. The Community of Fawnskin is located within the jurisdiction of the Big Bear Sheriff's Station. The average response time for emergency calls ~~to the unincorporated county area~~ within the jurisdiction of the Big Bear Sheriff's Station is 6.97 minutes. The response times may vary, plus or minus, depending on the number of service calls received. According to the Sheriff's Crimes Analysis Unit, between January 1, 2000 and January 1, 2001, the Sheriff's Department handled 9,028 calls for service in the unincorporated area of Big Bear Valley.[1]

SCHOOLS

The Project site is situated within the Bear Valley Unified School District (BVUSD). The BVUSD provides education for grades Kindergarten through 12. Table 5.3-1, *Bear Valley Unified School District Facilities*, details the BVUSD schools serving the Project site and includes current enrollment and maximum capacity. As indicated in Table 5.3-1, all three schools within the BVUSD presently exceed maximum capacity. In order to meet the existing need, portable classrooms have been located on these school campuses. According to the "Developer Fee Justification and Impact Analysis," dated October 2000, the average student generation rate per dwelling unit (DU) is 0.21 students/DU. According to the District, based on State standards, these schools do not have adequate school housing capacity presently and replacement facilities are needed.[2]

[1] Source: Written correspondence from Bobby R. Phillips (Captain) at the County of San Bernardino Sheriff's Department. Letter dated June 18, 2002.

[2] Source: Written correspondence from Dr. John Niederkorn (Director of Business) at Bear Valley Unified School District. Letter dated June 18, 2003.

Table 5.3-1
Bear Valley Unified School District Facilities

School	Grade Level	Current Enrollment	Maximum Capacity	Distance to Project site (miles)
North Shore Elementary School 765 N. Stanfield Cutoff	K-6	614	588	3.0
Big Bear Middle School 41275 Big Bear Boulevard	7-8	575	408	4.5
Big Bear High School 351 N. Maple Lane	9-12	921	697	8.0

Senate Bill (SB) 50

The major source of school construction and modernization had been the State School Construction Program until the passage of Senate Bill 50 (SB 50), School Facility Program. SB 50 authorized a $9.2 billion K-12 school and higher education bond that was presented to the State's voters on November 3, 1998. In addition, SB 50 revised developer fee and mitigation procedures for school facility purposes and reformed the State program that distributes State bond funds to K-12 school districts. On November 3, 1998, State voters approved Proposition 1A, a $9.2 billion bond measure, which provides funding for higher education facilities, K-12 facilities, modernization of older schools, additional funding for districts in hardship situations, and funding for class size reduction. With the passage of Proposition 1A, the Mira powers[3] of local governments were suspended on November 4, 1998 until 2006, which is the length of time the State bond money would be available to local school districts. As a result of this, school districts would continue to levy a school fee under existing rules (Government Code Section 65995, 65995.5 and 65995.7), which is currently up to $1.93 per square foot for residential construction and $0.31 per square foot for commercial and industrial development. SB 50 also established three levels of school fees: Level One, Level Two, and Level Three Fees. Level One Fees are the statutory fees of $1.93 per square foot for residential projects and $0.31 per square foot for commercial and industrial projects, which can be adjusted for inflation every two years beginning in 2000. Level Two Fees allow school districts to impose fees beyond the base statutory cap, under specific circumstances. Level Three Fees take effect in the event the State runs out of bond funds after 2006, which would allow school districts to impose 100 percent of the cost of the school facility or mitigation minus any local dedicated school monies. The school fee amounts provided for in Government Code Sections 65995, 65995.5 and 65995.7 would constitute full and complete mitigation for school facilities.

[3] The *Mira, Hart and Murrieta* court cases held that the provisions of the 1986 School Facilities Act limiting developer school fees to an initial amount of $1.50 per square foot are only applicable to adjudicative or quasi-judicial acts (such as tentative tract maps or conditional use permit approvals) and do not apply to legislative acts (such as general plan amendments, specific plan adoption or amendment or zoning amendments). The Mira, Hart and Murrieta decisions provided school districts and local agencies the legal authority under CEQA to require new development to fully mitigate school impacts in connection with legislative approvals, and allowed a City Council or Board of Supervisors to deny or refuse to approve a project based upon impacts to school facilities.

LIBRARIES

The Project area is serviced by the Big Bear Lake Branch Library, a 9,543 square-foot building, located at 41930 Garstin Drive. The Library is one of 28 branch libraries within the San Bernardino County Library system and serves approximately 17,200 residents of the Big Bear Lake area and the unincorporated Bear Valley. Approximately 6,000 people visit the library per month. The Library's materials collection includes books, periodicals and audio-visual materials. Public services provided by the library include:

- Reference services for adults and children (either in person or by phone);
- Programs (Summer Reading Program, LITE Program, English improvement classes, story hours, literary and cultural programs, literacy services, etc.); and
- Electronic reference sources (electronic information databases, Internet, etc.).

The San Bernardino County Library Facility Master Plan identifies the need to expand the existing Library building from 9,543 square feet to 15,443 square feet, in response to population increases.[4] Currently, there are no planned expansion projects for the library. Current trends in library services for the Big Bear Lake/Bear Valley area reflect increased circulation of materials, major demand for more computers and data bases, and requests for more educational programs.

WASTEWATER

The project site is located within the Big Bear Area Regional Wastewater Agency (BBARWA) sanitary sewer service area. The service area for BBARWA includes the entire Big Bear Valley and is served by three separate collection systems: the City of Big Bear Lake (62 percent of total flow), the Big Bear City Community Services District (34 percent of total flow) and County of San Bernardino Service Area 53B (four percent of total flow). Each underlying agency maintains and operates its own wastewater collection system and delivers wastewater to the BBARWA interceptor system for transport to the BBARWA Regional Wastewater Treatment Plant. The Regional Plant is a 93.5-acre site, located adjacent to Baldwin Lake in unincorporated San Bernardino County. The dry weather capacity of the Regional Plant is 4.8 million gallons per day. The average daily influent flow to the Regional Plant for 2001 was 2.1 million gallons per day.

The Project site is located within the County Service Area 53B (CSA-53B) collection system. Sewage from CSA-53B is transported via the BBARWA North Shore Interceptor/Force Main system to the Regional Wastewater Treatment Plant.

[4] Source: E-mail correspondence from Patricia Laudisio (Facility Coordinator) at the San Bernardino County Library. December 10, 2002.

Currently, the BBARWA has a ten-inch sewer force main located within the shoulder along the south side of State Route 38 that traverses the Project site. This force main conveys raw sewage from CSA 53-B to the Regional Wastewater Treatment Plant.

WATER

The Project site lies within the service boundaries of County Service Area 53, Improvement Zone C (CSA 53-C), which was created in 1991 to provide water service to unserved areas within CSA 53. Currently, water service is not provided to the project site. Even though the site is immediately adjacent to the water service jurisdiction of the Department of Water and Power (DWP), City of Big Bear Lake, DWP cannot provide water service without first complying with the provisions of Government Code Section 56133. Section 56133 requires formal review and approval by the Local Agency Formation Commission (LAFCO). However, the County Special District Department has the ability to establish a joint powers agreement with DWP to provide water service. Due to the proximity of DWP facilities and the ability to provide more cost-effective service by contracting with DWP, this service delivery arrangement appears to be the preferred method for providing water service to the project. At this time, neither agency has committed to approving such an agreement.

DWP is a public agency that provides drinking water to approximately 14,200 customers in the City of Big Bear Lake and surrounding areas, which include Fawnskin, Moonridge, Sugarloaf, Lake Williams, the Rim Forest area, and parts of Erwin Lake. DWP is responsible for testing and monitoring the Water System to assure a safe water supply that meets all State and Federal regulations. Big Bear Valley is unique in that all of the drinking water is obtained from the snow and rain that percolates into the ground. No lake or imported water is available for drinking water in Big Bear Valley. DWP currently operates, maintains and monitors:

- 33 well sites;
- 13 booster stations;
- 17 reservoirs;
- 15 chlorination stations;
- 20 sample stations; and
- Hundreds of pressure reducing valves.

DWP installs, replaces and repairs hundreds of fire hydrants within the water system, as well as maintains, replaces and repairs 167 miles of mainlines, 14,200 meters, meter boxes and service lines and 3,000 mainline valves.

DWP's 2000 Consumer Confidence Report for the Fawnskin Water System states that six wells, two boosters and three reservoirs serve the Fawnskin area.[5] The total capacity of the reservoirs is 365,000 gallons. There are also three portable generators and two portable booster pumps in the Fawnskin area. In 2000, 41.2 million gallons of water were pumped into the Fawnskin Water System.

[5] Source: http://www.citybigbearlake.com/dwp/dwppage/Forms/WQ00FSp1.pdf .

According to the March 2002 Water Feasibility Study prepared for the Project, the Project site is located near the southeast side of Fawnskin, which, based on computer simulations receives water from Cline Miller Reservoir.[6] Exhibit 5.3-1, *Water Distribution System*, illustrates the existing distribution piping system near the proposed development, as well as the recommended extension pipeline layout.

The DWP Board of Commissioners has considered placing limitations on the number of new water connections within Big Bear Lake, Moonridge, Erwin Lake, Sugarloaf, and Lake Williams Services areas. To date, connection limitation discussions have not focused on the Fawnskin service area.

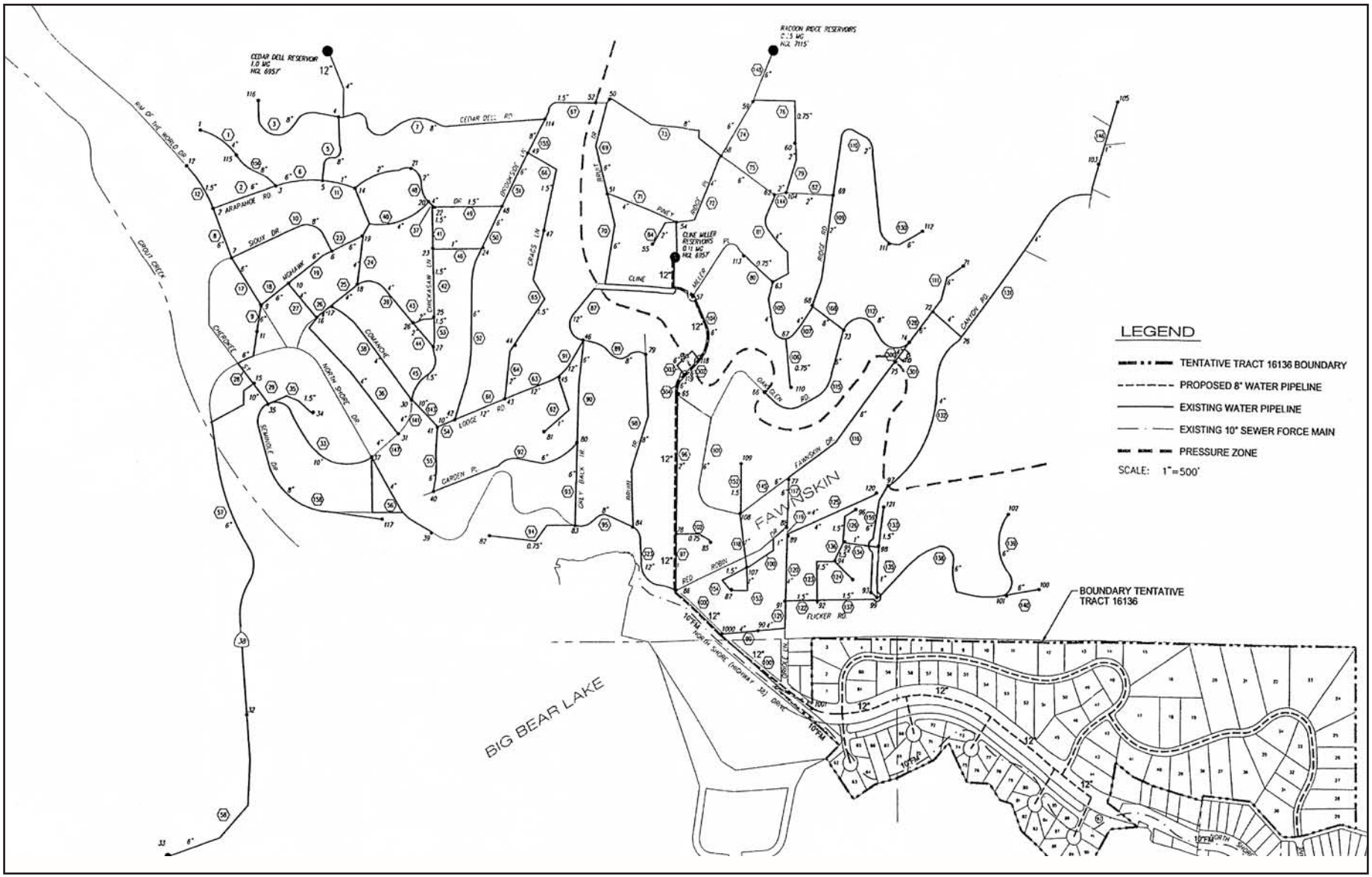
Senate Bills 221 and 610

Senate Bills 221 and 610 were signed into law by Governor Davis in 2001 and took effect January 1, 2002. The two senate bills amended State law to better link information on water supply availability to certain land use decisions by cities and counties. The two companion bills provide a regulatory forum that requires more collaborative planning between local water suppliers and cities and counties. All SB 610 and 221 reports are generated and adopted by the public water supplier.

Senate Bill (SB) 610 requires a detailed report regarding water availability and planning for additional water supplies that is included with the environmental document for specified projects. All "projects" that meet any of the following criteria require the assessment:

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 ft^2 of floor space;
- A proposed commercial office building employing more than 1,000 persons or having more than 250,000 ft^2 of floor space;
- A proposed hotel or motel, or both, having more than 500 rooms;
- A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 ft^2 of floor area;
- A mixed-use project that includes one or more of the projects specified in this subdivision; or
- A project that would demand an amount of water equivalent to, or greater than the amount of water required by a 500 dwelling unit project.

[6] Source: Water Feasibility Study for Tentative Tract 16136, prepared by So & Associates Engineers, Inc. March 13, 2002.



Source: City of Big Bear Lake Department of Water and Power Feasibility Study TTM 16136.

Exhibit 5.3-1

RBF CONSULTING

PLANNING ■ DESIGN ■ CONSTRUCTION

12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Water Distribution System

While SB 610 primarily affects the Water Code, SB 221 principally applies to the Subdivision Map Act. The primary effect of this bill is to condition every tentative map for an applicable subdivision on the applicant by verifying that the public water supplier (PWS) has "sufficient water supply" available to serve it. Under SB 221, approval by a city or county of certain residential subdivisions requires a written verification of sufficient water supply. SB 221 applies to any "subdivision," defined as:

- A proposed residential development of more than 500 dwelling units, if the PWS has more than 5,000 service connections.

- Any proposed development that increases connections by 10 percent or more, if the PWS has fewer than 5,000 connections. Water Code 10912(7)(C) states that a "public water system" is defined as a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections.

Based on the "Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001" the following excerpt shows that 300 dwelling units are necessary to qualify as a "subdivision," and therefore be subject to SB 221.

> *"Code 66473.7(a) provides that a "subdivision" for a public water system with fewer than 5,000 service connections is a proposed development that would increase the number of service connection for a public water system by 10% or more, a "subdivision" could be as few as 300 dwelling units. For example, a water utility that has 3,000 service connections would experience an increase in the number of service connections by 10% if it were required to serve a proposed residential development with 300 units, thus making the 300-unit development a "subdivision" under 221."*

As stated above, Water Code 10912(7)(C) states that a "public water system" is defined as a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections. Therefore, if Fawnskin has only 673 connections it does not qualify as a "public water system," but rather a piece of a larger "overall system." Whether the project is under the jurisdiction of the DWP or the County Special Districts Department, each of these agencies "overall system" has more than 3,000 connections qualifying them as public water systems. Thus, the proposed 92 dwelling units would not exceed 10 percent of the 3,000 connections or 300 dwelling unit minimum dwelling unit threshold to be subject to SB 221 reporting requirements.

~~The proposed meets neither of the above scenarios.~~

SOLID WASTE

Big Bear Disposal, Inc. would likely provide solid waste collection within the Project area. Waste would be transported to the Big Bear Transfer Station, located on Holcomb Valley Road in Big Bear City, approximately 1.5 miles north of Highway 18. The transfer station is owned and operated by the County of San Bernardino Waste Management Division. The station is permitted to receive 400 tons of solid waste per

day. Waste would be transferred from the Big Bear Transfer Station to the Barstow Landfill.

The Barstow Landfill is also owned and operated by the County of San Bernardino Waste Management Division. The landfill is permitted to receive 525 tons of waste per day. The remaining capacity is 218,492 cubic yards and the total permitted capacity is 3,580,000 cubic yards. The landfill is scheduled to close June 1, 2012.[7]

On average, each resident in unincorporated County areas disposes of 3.8 pounds of waste per day (1998). In comparison, each resident in the City of Big Bear Lake disposes of 6.2 pounds of waste per day, on average.

The California Integrated Waste Management Act, Assembly Bill 939 (AB 939), required jurisdictions to divert 50 percent of the wastestream away from land disposal by the year 2000. If the 50 percent goal were not met by the end of year 2000, the jurisdiction would be required to submit a petition for a goal extension to the Integrated Waste Management Board (IWMB). The San Bernardino County (unincorporated) IWMB-diversion rate in the 1999 reporting year was 38 percent (pending IWMB approval). The County's (unincorporated) diversion rate in the 2000 reporting year was 43 percent (pending IWMB approval). The City of Big Bear Lake diversion rate in the 2000 reporting year was 59 percent (pending IWMB approval).[8]

Currently, the County is in the process of revising and updating the Countywide Integrated Waste Management Plan for the County of San Bernardino. The intent of this Plan is to establish goals and policies for the County regarding source reduction, recycling and composting, and environmentally safe solid waste management alternatives to land disposal. The revised Plan would also help the County in striving towards meeting the diversion rate requirements specified by AB 939.

The California Integrated Waste Management Board is still focused on assisting local officials throughout the State in meeting the 50 percent diversion requirement set for 2000. As of May 2003, neither the California Integrated Waste Management Board nor the State Legislature have introduced new legislation to set diversion requirements beyond 2000.

NATURAL GAS

The Project site is located entirely within the Southwest Gas Corporation (SGC) utility service territory. Currently, a natural gas "main" pipeline is installed in the right-of-way of State Route 38. Since the site is vacant, no natural gas services are currently provided to the project site.

[7] Source: Integrated Waste Management Board website. Solid Waste Information System (SWIS), Facility/Site Summary Details for the Barstow Refuse Disposal Site. July 22, 2002. www.ciwmb.ca.gov/SWIS/

[8] Source: Integrated Waste Management Board website. Jurisdictional Diversion Rate Summary for San Bernardino – Unincorporated and Big Bear Lake. July 22, 2002. www.ciwmb.ca.gov/profiles/

ELECTRICITY

The Project site is located within the service territory of Bear Valley Electric Service (BVES). An overhead power line traverses the Project site in an east/west direction. The line is located adjacent to and along the existing State Route 38 roadway alignment. The existing line is 4160/2400 volts, and has #2 copper as its conductor. The distribution line is fed by a substation located west of Stanfield Cutoff, which in turn is fed by a 34Kv transmission line, whose source is the Goldhill Switching Center located off of State Route 18 and Holcomb Valley Road, approximately six miles east of the project site. The transmission line has a section of #2 copper that limits its capacity. Winter loads have reached the maximum capacity on this line. Substantial load additions may cause a need for facilities to be upgraded.

IMPACTS

SIGNIFICANCE CRITERIA

Pursuant to Appendix G, Environmental Checklist of the California Environmental Quality Act (CEQA) Guidelines, a Project would normally have a significant adverse impact on public services and utilities if it results in any of the following:

PUBLIC SERVICES

- If the Project would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services. (refer to Impact Statements 5.3-1, 5.3-2, 5.3-3, and 5.3-4).

UTILITIES AND SERVICE SYSTEMS

- If the Project exceeds wastewater treatment requirements of the applicable Regional Water Quality Control Board (refer to Impact Statement 5.3-5);

- If the Project requires or results in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects (refer to Impact Statements 5.3-5 and 5.3-6);

- If the Project requires or results in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects (refer to Section 5.8, *Hydrology and Drainage*);

- If the Project has insufficient water supplies available to serve the Project from existing entitlements and resources, or if new or expanded entitlements are needed (refer to Impact Statements 5.3-6 and 5.11-2);

- If the Project results in a determination by the wastewater treatment provider which serves or may serve the Project that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments (refer to Impact Statement 5.3-5);

- If the Project is served by a landfill with insufficient permitted capacity to accommodate the Project's solid waste disposal needs (refer to Impact Statement 5.3-7); and/or

- If the Project does not comply with federal, state, and local statutes and regulations related to solid waste (refer to Impact Statement 5.3-7).

Impacts to services and utilities are analyzed below according to topic. Mitigation measures at the end of this section directly correspond with the identified impact.

FIRE PROTECTION

5.3-1 *Project implementation could result in significant physical impacts with respect to fire protection. Analysis has concluded that impacts would be less than significant with the recommended mitigation measures.*

Project implementation would increase development beyond existing conditions, thus increasing the demand for fire protection in the form of additional calls for service. The Project site is located in a high fire hazard area and Fire Hazard Overlay District. Accordingly, Project development would be subject to compliance with various policies and standards for adequate services and facilities, including developmental regulation requirements for minimum road widths and clearance around structures. Additionally, the Project would be required to meet the Peakload Water Supply System Guidelines (Figure II-5 of the General Plan, *Peakload Water Supply System Guidelines*) or be adequately served by water supplies for domestic use and community fire protection in accordance with standards as determined by the County and the local fire protection agency/authority.

The San Bernardino County Fire Department has indicated that ~~the manpower demand as a result of the proposed project would need to be mitigated through increased fire flow~~ due to the size and scale of the proposed project, specific fire flow requirements would need to be met. Instead of 1,500 gpm at 2 hours (which is based on a maximum square foot house of 3,600 square feet), the fire flow requirement would be 1,750 gpm at 2 hours, based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm at 2 hours, based on homes greater than 4,800 square feet. ~~Fire sprinklers would be required for each residence in lieu of additional manpower.~~ Homes above 5,000 square feet would have a larger sprinkler requirement.

A fuel modification area and plan program would be required ~~which would not terminate at a property line~~for the proposed project under the provisions of the FS1 Fire Safety Overlay District. ~~The 100 foot fuel modification requirement would extend beyond the property lines. Where such fuel modification zone extends on to U.S. Forest Service land, an easement or permit would be required. The 100 foot fuel modification zone may be greater in steeper areas (up to 300 feet), as determined by~~

~~the fire agency.~~Per the requirements of the FS1 Overlay District, the project would require a 30-foot setback from the National Forest. The project proposes 100-foot fuel modification zone adjacent to National Forest land, located to the north and east of the project area. As shown in Exhibit 3-4, *Site Plan*, the fuel modification zone would be located within the project boundaries on Lots 15 to 16 and 20 to 29. A Fuels Management Plan would be established for the project to implement the fire safety requirements of the FS1 Overlay District. The Fuels Management Plan would be subject to review and approval by the San Bernardino National Forest Service and the San Bernardino County Fire Department.

The fire flow requirements and ~~fuel modification~~Fuel Management Plan~~requirements~~ along with additional mitigation measures listed would reduce impacts to fire protection services to a less than significant level.

POLICE PROTECTION

5.3-2 *Project implementation could result in significant physical impacts with respect to police protection. Analysis has concluded that a less than significant impact would occur.*

Implementation of the proposed Project would increase the police service calls to the vicinity beyond existing conditions. This would be a direct result of the development of single-family residences and the resultant increase in population. At full build out of the 92 residential lots, the project has the potential to increase the Fawnskin population by approximately by 212 persons (92 housing units x 2.31 persons/ household) (refer to Section 6.3, *Growth Inducing Impacts*). The peak period population would increase from 1,428 persons to approximately 1,642 persons, or a 15 percent population increase. According to the San Bernardino Sheriff's Department, the Project may result in an increase in burglar alarm calls, general criminal investigations, missing or lost persons, emergency medical calls, thefts of boats and vandalism.[9] Although police protection services would need to be increased as a result of the Project, it is anticipated that Project implementation would not require any new police facilities or the alteration of existing facilities to maintain acceptable performance objectives.[10] The Projects increase in demand for police services would be offset through Project related fees and taxes. Thus, impacts are anticipated to be less than significant in this regard. No mitigation measures are recommended.

SCHOOLS

5.3-3 *Project implementation could result in significant physical impacts to existing school facilities. Potential impacts to school facilities are concluded as less than significant following payment of school impact fees and compliance with all applicable requirements, codes, and ordinances.*

[9] Source: Written correspondence from Bobby R. Phillips (Captain) at the County of San Bernardino Sheriff's Department. Letter dated June 18, 2002.

[10] Source: Telephone conversation with Bobby R. Phillips (Captain) at the County of San Bernardino County Sheriff's Department. August 12, 2002.

Development of the proposed Project could generate a student population increase of approximately 20 students (.21 students per unit x 92 units) within the BVUSD. Three existing schools would serve the proposed Project, one elementary school, one middle school, and one high school. As noted in Table 5.3-1, *Bear Valley Unified School District Facilities*, these schools are presently over capacity. The District has augmented existing school facilities with portable classrooms to accommodate the over-crowded conditions. Based on correspondence with the BVUSD, the District anticipates that the Project may result in the need for additional facilities, and may require modifications to schools of attendance.

Currently, the District collects Developer's Fees for new construction. The current residential rate is $0.82 per square foot. The Developer's fees are determined by a Developer Justification Study commissioned by the District every two years. The District has stated that it could serve the projected number of students that would be generated from the proposed Project. BVUSD is currently in year four of a modest enrollment decline. Currently, the District seeks modest enrollment growth and the proposed Project would contribute to modest enrollment growth.[11] Thus, payment of Developer Fees in accordance with the latest Developer Justification Study would reduce impacts to less than significant levels.

LIBRARIES

5.3-4 *Project implementation would increase the demand on library services. Analysis has concluded that that a less than significant impact would occur.*

Implementation of the proposed Project would increase the population of the service area for the Big bear Branch Library and would impact the size and services of the library facility. The increase in population would necessitate a proportionate increase in staffing, resources and materials. The increased demand is also anticipated to create a nominal demand for additional library space at existing library facilities.

Service needs of the library are determined by per capita for facility square footage, number of items in collection and program requirements. A standards reference book, *Minimum Standards for Public Library Systems*, is used as a base for determining per capita recommendations. The nationally accepted standard of 0.5 square feet per capita has been tempered in recent years due to the advances in electronic publishing and on-line catalogs which allow patrons to identify and retrieve materials from neighboring branches. These factors have allowed libraries to reduce the amount of book stack space needed to house library collections. However, they have not mitigated the spatial needs for other library functions, such as study tables, patron lounge areas, circulation services, children's sections, meeting space and program areas. The Division of Library Development Services of the State of California, which holds the responsibility for library facility planning and financing, would not recommend anything less than the current state average of 0.35 square feet per capita and would prefer the accepted standard of 0.5 square feet per capita.

[11] Source: E-mail correspondence from John Niederkorn (Director of Business) at the Bear Valley Unified School District. November 26, 2002.

Funding to improve and/or increase library facilities and resources would occur by two methods. One source of revenue would be based on a resolution established by the San Bernardino County Board of Supervisors that provides a tax rate of one and on-half cents per $100 of assessed valuation of property in the community. Second, libraries would receive funding from public libraries fund(s), administered by the State of California. Funding received from property taxes and/or State funds would reduce impacts to a less than significant level.

WASTEWATER

5.3-5 *Project implementation would generate additional wastewater beyond current conditions. Analysis has concluded that impacts would be less than significant with the recommended mitigation measures.*

The quantity of wastewater that is attributable to the Project site would increase with implementation of the proposed Project. A Sewer Feasibility Study was completed for the Project site by So & Associates Engineers, Inc. According to the Study, the sewer capacity requirement for the proposed Project is determined based on equivalent dwelling units (EDUs). For the Study, each subdivided lot was considered as one EDU and average wastewater flow per EDU in the CSA 53B was typically estimated at 215 gallons per day (gpd). Thus, with the Project's assigned maximum occupancy of 92 EDUs and an average flow at 215 gpd/EDU, the Project's average daily wastewater flow would be 19,780 gpd. This would represent an increase of approximately 25 percent over CSA 53B's current average daily dry weather flow of 80,000 gpd. According to the So Engineer's report for preliminary design purposes, a peaking factor of four was utilized. Thus, the estimated peak wastewater flow immediately downstream of the proposed development is anticipated to be 79,120 gpd (54.9 gallons per minute).

The BBARWA anticipates that the existing sewer system located to the east of the Project site is capable of handling the wastewater flow for the proposed development based on estimated flows, discussed above. The BBARWA has indicated that a computer model for capacity analysis of the North Shore Interceptor System would verify the capacity starting July 1, 2002.[12] To date, an internal collection sewer system design has not been proposed by the Project. Thus, the Project Applicant would be required to submit the proposed internal collection system to CSA-53B for review and approval. The Applicant would also be required to pay all applicable CSA 53-B and BBARWA collection fees, including on-site collector sewer and lift station(s) fees, off-site sewer extensions fees, local sewer connection fees, and regional collection fees, as determined by the San Bernardino County Special Districts. Further, standby fees may be required for unimproved parcels within 200 feet of the available sewer system.

On-Site Facilities. The proposed development would be entirely responsible for all costs of internal collection sewer facilities including manholes and connection to the CSA 53-B system at locations(s) approved by CSA 53-B. All on-site gravity systems would be required to be a minimum eight inches in diameter. All on-site plans would

[12] Source: Written correspondence from Jerry Rang (Plant Superintendent) at the Big Bear Area Regional Wastewater Agency. June 18, 2002.

be required to meet CSA 53-B design standards and specifications, and constructions plans would be submitted for plan check and approval to the Special Districts Department's engineer.

Off-Site Facilities. A grading plan and sewering layout plan of the proposed development were not available for the Sewer Feasibility Study. The proposed development may be able to convey some of the wastewater flow via gravity sewer to the existing Pump Station; and some of the subdivided lots may require additional on-site sewage lift-station(s). CSA 53-B staff and engineer would continue to monitor and upgrade the collection sewer system to ensure adequate capacity and reliable service to its customers.

If the project should involve an on-site wastewater treatment plant, rather than connecting to the public sewer system, the project would be subject to not only BBARWA's regulations, but also the Joint Powers Agreement and Operating Agreements with BBARWA's three member agencies (Collecting Agencies): the City of Big Bear Lake, the Big Bear Community Services District and the County of San Bernardino on behalf of County Service Area 53-B. Operating Agreement #1, Section 3.05, Other Treatment Plant Works, puts restrictions on the construction and operation of wastewater treatment works by the Collecting Agencies within Big Bear Valley. The section reads:

> *"…none of the Collecting Agencies shall construct, install, acquire, or operate any plant, enterprise, works or facilities, of any nature whatsoever for the treatment or disposal of any sewage or wastewater from any area whether within or without its service area, without the consent of BBARWA; nor shall any of the Collecting Agencies contract with any other agency other than BBARWA for such treatment or disposal. During the term of this agreement all sewage and wastewater collected by the sewage collection system of each of the Collecting Agencies shall be transported and delivered to the regional System for treatment and disposal therein."*

In summary and as stated in the Sewer Feasibility Report, the existing BBARWA sewer system located to the east of the project site would be capable of handling wastewater flow from the proposed Project. Thus, the proposed Project would not result in the need to construct new wastewater facilities or require the expansion of new wastewater facilities. The proposed Project would be required to comply with applicable BBARWA (and Collecting Agencies, if required) rules and regulations pertaining to construction and operation of facilities, in addition to required payment of all new and modified facility fees. To ensure that impacts remain at less than significant levels, mitigation measures are recommended. Mitigation for the Project includes installation/replacement of force main(s) to maintain adequate service performance standards and installation of air release valves and vaults at high elevation points on new force mains to minimize odors.

WATER

5.3-6 *Project implementation would increase the demand for water beyond existing conditions. Analysis has concluded that due to the inability of water providers to confirm service to the project, impacts are concluded as significant and adverse. This conclusion is further supported by the*

potentially significant groundwater overdraft conditions cited in Section 5.11 of the EIR.

As noted in the Existing Conditions section, the Project site lies within the service boundaries of County Service Area 53, Improvement Zone C (CSA 53-C), which was created in 1991 to provide water service to unserved areas within CSA 53. Currently, water service is not provided to the project site. Even though the site is immediately adjacent to the water service jurisdiction of the Department of Water and Power (DWP), City of Big Bear Lake, DWP cannot provide water service without first complying with the provisions of Government Code Section 56133. Section 56133 requires formal review and approval by the Local Agency Formation Commission (LAFCO). However, the County Special Districts Department has the ability to establish a joint powers agreement with DWP to provide water service. Due to the proximity of DWP facilities and the ability to provide more cost-effective service by contracting with DWP, this service delivery arrangement appears to be the preferred method for providing water service to the Project. At this time, neither agency has committed to approving such an agreement. Based upon the inability for providers to confirm services, coupled with potentially significant overdraft conditions cited in Section 5.11 of the EIR, impacts are concluded to be significant and adverse.

County Service Area 53-C could provide water to the Project site under two possible scenarios. CSA 53-C could accept water supply facilities that would be constructed by the applicant and dedicated to the County for management and operation by Special Districts Department. However, the most likely scenario would be for the County Special Districts Department to establish a joint powers agreement with the City of Big Bear Lake Department of Water and Power (DWP) to provide water service. The Big Bear City Community Services District (BBCSD) is not an option as a service provider since it does not have jurisdiction west of Division Drive, which is located approximately four miles to the east of the project site.

The analysis that follows below is based on an evaluation of the project's water service requirements, the existing conditions of the DWP system in the community of Fawnskin, and consideration of the conditions that would apply should CSA 53-C contract with DWP for water supply. The water service requirements discussed below would also apply in the situation under which CSA 53-C would operate and maintain a water system that was constructed and dedicated to the County.

According to the Water Feasibility Study completed for the proposed Project, each residential lot is considered as one equivalent dwelling unit (EDU).[13] The average day demand (ADD) and maximum day demand (MDD), based on the number of EDUs, was estimated to determine the impact on the existing water system.

Water Demand. The DWP has estimated the ADD for the Fawnskin area to be approximately ~~450~~ 250 gallons per day per EDU (gpd/EDU). [Note to Reviewer: The updated calculation is based upon further analysis by SO & Associates Engineers, dated September 7, 2004.] The letter report has been incorporated in to the EIR Appendix.] The MDD considers water usage over an 8 to 10-hour period each day. The Project's ADD and MDD are as follows:

[13] Source: Water Feasibility ~~Study~~ Update for Tentative Tract 16136, prepared by So & Associates Engineers, Inc. ~~March 13, 2002~~ September 7, 2004.

Average daily demand (ADD) = 92 EDU x 250 gpd/EDU
= 25.77 AF/year

Maximum day demand (MDD) = 2.5 x ADD/1,440 minutes per day
= 57,500 gpd (about 40 gpm)

Assuming the ADD calculated above, the project would require approximately 25.77 acre-feet of water per year to supply the proposed residential uses.

Fire Flow Requirements. The existing water distribution system was originally designed for approximately 750-gpm fire flow for two hours. The current requirement per the County Fire Department for the Fawnskin area is between 1,000 gpm and 1,500 gpm depending on the building square footage. The fire flow may be further increased in the future. As such, the water distribution system was analyzed to handle the maximum day demand of the proposed development plus fire flow up to 1,500 gpm.

Water Supply and Storage Requirements. The State Health Department requires storage to account for one peak day usage. The DWP typically experiences one peak day during a summer holiday when tourists and part-time residents become full-time users. The coefficient of ~~450~~ 250 gpd/EDU and corresponding MDD is representative of that day and is the basis for calculating the water demand and storage requirement for the proposed Project as presented in prior discussions and outlined below:

Domestic Water Supply requirement (max day) = 40.0 gallons per minute

Operational Storage = (0.3 x MDD)	=	17,250 gallons
Emergency Storage = (1.0 x MDD)	=	57,500 gallons
Subtotal (without fire storage)	=	74,750 gallons
Fire Storage (1,500 gpm x 2 hours)	=	180,000 gallons
Total Storage Requirement	=	255,000 gallons

Based on proposed development requirements (at MDD), ~~two new wells would be required~~ the project would need to have a water supply that~~to~~ could provide a minimum of ~~72.0~~ 40 gallons per minute. As discussed below and in Section 5.11, *Hydrology and Drainage*, two existing on-site wells could potentially supply a portion of the water demand to the project. The project site is located within tributary subarea A of the North Shore Hydrologic Subunit. The groundwater recharge for subarea A is estimated to be approximately 29 acre-feet per year. Since the project would require approximately 46 acre-feet per year, it is concluded that on-site wells alone could not supply the necessary water resources to support the proposed residential uses. If the on-site wells were utilized to supply a portion of the water supply to the project, ~~T~~the Project Applicant would be required to deposit funds with the DWP and/or BBCSD to equip the wells to meet the appropriate water agency's standards.~~for new well construction unless a proven source of supply is provided by the developer at locations satisfactory to DWP and not exceeding sub basin safe yields.~~ As stated in Section 5.11, ~~Hydrology and Drainage, the testing of overdraft conditions for~~ the groundwater basin associated with the North Shore Hydrologic Subunit ~~is inconclusive~~has the potential to be in an overdraft situation, thus, it has been concluded that impacts to groundwater resources are significant and

unavoidable. Therefore, additional studies and analysis will need to be provided by the Project Applicant to indicate a proven source of water supply for the project.

Potential Water Supply Wells FP-2 and FP-3. As stated above, the project site includes two existing on-site water wells located within the North Shore Hydrologic Subunit that could potentially supply water to the project. ~~The two wells referenced may have potential to meet the Moon Camp area demand requirements.~~ The wells, which were drilled in 1987, are located on the Moon Camp property and are not currently in operation. The most recent data available regarding the wells was collected in 1987 and is summarized in Table 5.3-2, *Summary of Data on Wells FP-2 and FP-3*.

Table 5.3-2
Summary of Data on Wells FP-2 and FP-3 (Year 1987)

State Well No.	Well Name	Date Drilled	Completed Depth (ft)	Screened Internal[1] (ft-ft)	Static Water Level (ft)	Date	Instantaneous Discharge Rate (gpm)	Drawdown (ft)	Specific Capacity (gpm/ft)
2N/1W-1383	FP-2	1987	405	60-370	6	1987	100	20	3
2N/1W-1302	FP-3	1987	304	66-238	45	1987	75	22	3
Sources of Data: California State DWR, Boyle Engineering Corp. (1987), Law Environmental (1987).									
[1] The screened interval is not continuous – values summarized represent top and bottom of well screen.									

Although the yields indicate that the wells show adequate potential to supply water to the project, the North Shore Hydrologic Subunit has been identified to likely be in a state of overdraft and more specifically, subarea A is estimated to have a recharge rate of approximately 29-acre feet per year, which is not enough to meet the 46 acre-feet per demand of the proposed project. ~~Although overdraft conditions have been noted for the groundwater basin, the yield of the wells (as tested in 1987), show adequate water supply potential. However, prior to use, video logs should be run on each well to examine the condition of the casing and screen. Based on review of the video logs, it can be determined if any modifications are necessary prior to use. Following the video inspection (and redevelopment if necessary), updated values of production rates and pumping levels should be obtained through step-drawdown and constant rate pumping tests. Water samples should also be taken during testing and analyzed in accordance with standard requirements for a potable water supply.~~

Water Distribution System Review. Based on its location and computer simulations, the proposed Project would receive water from the Cline Miller Reservoir. Exhibit 5.3-1, *Water Distribution System*, shows the existing distribution piping system in the vicinity of the Project site and the recommended extension pipeline layout. Referencing the hydraulic grade line of 6,957 feet elevation at Cline Miller Reservoir and the approximate ground elevation at the Project site from 6,780 to 6,800 feet, the minimum static pressure at the proposed parcel is approximately 68 psi.

Thus, under maximum day demands plus residential fire flow up to 1,500 gpm, the minimum residual pressure of 20 psi can be met, based on the existing hydraulic

pipeline model. However, the existing Cline Miller Reservoir is an old 100,000 gallon concrete reservoir which would not be sufficient to serve the proposed Project. The existing site has limited space for a new tank without demolishing the old tank and/or securing additional property. Therefore, the Water Feasibility Report recommends that the old concrete reservoir be replaced with a new 300,000 to 400,000 gallon storage reservoir. The Project Applicant would be required to advance fair share funds towards construction of the new reservoir and a 12-inch transmission pipeline. If other parcels of land can be benefited by the off-site improvements based on review by DWP's engineer, a "reimbursement agreement" would be considered by DWP. The developer would also be required to submit landscaping plans for review to the DWP. Landscape designs utilizing low water usage would be encouraged to achieve water conservation, which in turn may lower water supply demand.

All water plans (on-site) would be required to be submitted for review/approval by DWP to confirm that water mains do not conflict with the BBARWA 10-inch sewer force main (which would be relocated at developer's cost).

Since the proposed Project would result in the need to construct new water facilities and/or require the expansion of new wastewater facilities and the DWP's existing facilities do not have adequate capacity to serve the project's demand, impacts are considered potentially significant. With implementation of the recommended mitigation measures and compliance with all applicable regulations and payment of fees, impacts to the water distribution system would be reduced to less than significant levels.

Compliance with Senate Bill 221 and Senate Bill 610:
Adequacy of Water Supply

As stated in the *Existing Conditions* section, adequacy of water supplies for the proposed Project must be determined per the requirements of Senate Bills 221 and 610. SB 610 requires that a detailed report regarding water availability and planning for additional water supplies if the project is a proposed residential development of more than 500 dwelling units. The proposed Project consists of 92 residential lots, thus, the requirements of SB 610 do not apply to the Project. SB 221 applies to any "subdivision," defined as:

- A proposed residential development of more than 500 dwelling units, if the Public Water Supplier (PWS) has more than 5,000 service connections.

- Any proposed development that increases connections by 10% or more, if the PWS has fewer than 5,000 connections. Water Code 10912(7)(C) states that a "public water system" is defined as a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections.

Based on the "Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001" the following excerpt shows that 300 dwelling units are necessary to qualify as a "subdivision," and therefore be subject to SB 221.

"Code 66473.7(a) provides that a "subdivision" for a public water system with fewer than 5,000 service connections is a proposed development that would increase the number of service connection for a public water system by 10 percent or more, a "subdivision" could be as few as 300 dwelling units. For example, a water utility that has 3,000 service connections would experience an increase in the number of service connections by 10 percent if it were required to serve a proposed residential development with 300 units, thus making the 300-unit development a "subdivision" under 221."

As stated above, Water Code 10912(7)(C) states that a "public water system" is defined as a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections. Therefore, if Fawnskin has only 673 connections it does not qualify as a "public water system," but rather a piece of a larger "overall system." Whether the project is under the jurisdiction of the DWP or the County Special Districts Department, each of these agencies "overall system" has more than 3,000 connections qualifying them as public water systems. Thus, the proposed 92 dwelling units would not exceed 10 percent of the 3,000 connections or 300 dwelling unit minimum dwelling unit threshold to be subject to SB 221 reporting requirements.

SOLID WASTE

5.3-7 *Development of the Project area would result in increased solid waste generation. Project compliance with the Integrated Waste Management Plan for the County of San Bernardino (currently being revised) would reduce the amount of solid waste which is ultimately disposed of at the Barstow Landfill and maintain potential impacts at a less than significant level.*

As stated in the *Existing Conditions* section, residents in the City of Big Bear Lake dispose of an average of 6.2 pounds of waste per day. The City of Big Bear Lake diversion rate in the 2000 reporting year was 59 percent (pending IWMB approval).[14] Based on the City of Big Bear Lake generation factors and a maximum occupancy scenario of 92 dwelling units, the proposed Project would generate an estimated 240 tons of solid waste per year or 0.6 tons of solid waste per day (2.31 persons/household x 6.2 pounds/day x 92 dwelling units x 365 days/year). This projected increase in solid waste generation would increase the demand to provide disposal service and would impact the capacity at the Barstow Landfill. Further, this increased solid waste generation would incrementally shorten the lifespan of the Landfill. Under existing State permits, the landfill has sufficient capacity to accommodate the disposal of solid waste at least to the year 2012.

It is anticipated that the Project's estimated volume of solid waste generation would be reduced through the storage and collection of recyclables. Although there are currently no curbside recycling programs in the project area, the County Solid Waste Management Division encourages waste reduction, recycling and reuse activities. The Division encourages the development of community drop-off station(s) in the

[14] Source: Integrated Waste Management Board website. Jurisdictional Diversion Rate Summary for San Bernardino-Unincorporated and Big Bear Lake. July 22, 2002. www.ciwmb.ca.gov/profiles/

Fawnskin area.[15] The Division's recycling efforts include providing residents and businesses with information regarding backyard composting, commercial green waste management, grasscycling, and waste prevention. Furthermore, the Division operates a Speakers Bureau that speaks to various groups on aspects of waste management. Additional solid waste recycling efforts in the County include sorting waste materials (e.g. cardboard and aluminum) at the Big Bear Transfer Station into mixed recycling bins and development of the Zero Waste Communities program. The Zero Waste Communities are 15 cities/towns that have partnered with the County of San Bernardino to educate their residents and businesses on ways of zero waste living.[16] One aspect of the Zero Waste Communities program is to provide residents with a directory of listings, including the name and phone number, to places that will accept various entities of solid waste (i.e., appliances, tires, televisions, etc.).

Additionally, it should be noted that the volume of the Project's solid waste, which would be disposed of at Barstow Landfill, would be further reduced due to the requirements of AB 939. Therefore, implementation of the proposed Project would result in a less than significant impact with respect to solid waste.

NATURAL GAS

5.3-8 *Project implementation would result in an increased demand for natural gas service beyond existing conditions and would require expansion of the existing gas system. Analysis has concluded that a less than significant impact would occur in this regard.*

The Southwest Gas Corporation has indicated that natural gas "main" pipelines are installed in the right-of-way of State Route 38. The Southwest Gas Corporation has conclude that there is sufficient capacity in their facilities to provide natural gas service to the Project area without any significant impact on the environment. As such, extensions to existing facilities would be required in order to provide service to the proposed development. Service would be provided in accordance with the Southwest Gas Corporation's policies and extension rules on file with the California Public Utilities Commission. Future natural gas service to the Project area would require coordination with the Gas Company's engineering department for a comprehensive plan as to levels of service required. Implementation of the proposed Project would result in a less than significant impact with respect to natural gas service.

ELECTRICITY

5.3-9 *Project implementation would result in an increased demand for electrical service beyond existing conditions and would require expansion of the existing electrical system. Analysis has concluded that impacts would be less than significant.*

[15] Source: Phone conversation with Rex Richardson at the San Bernardino County Solid Waste Management Division. December 3, 2002.

[16] Source: Zero Waste Communities website. www.zerowastecommunities.org

An increased demand for electrical service would occur at the Project site as a result of the proposed development. Other tracts with large lots, similar to the Project, have diversified loading demand estimates ranging from 4 to 5 Kw per lot (i.e., average instantaneous draw from electrical service system). Thus, according to Bear Valley Electric Service (BVES), it is anticipated that there would be a substantial loading increase upon build-out of the proposed Project.[17] Since the source transmission line to the Project area has reached its peak, any large load addition may be difficult to serve. BVES states that several alternatives would be evaluated to relive the load on the transmission line. One alternative would be to shift load to another transmission line, however, other lines are also operating near capacity. Another alternative would be to investigate a distributed generation option. Distributed generation involves placing a power source (i.e., reciprocating engine that uses natural gas to power generator) on the site that would generate power on an as needed basis, such as during peak load times (i.e., winter, holiday weekends, etc). The distributed generator would be owned by the Project Applicant and/or BVES, depending on future agreements between the Applicant and BVES.

According to BVES, the total length of the distribution line extending through the Project area would likely need to be relocated. From Stanfield Cutoff, the existing distribution feeder proceeds westerly for 2.6 miles underground, then traverses overhead. The current overhead line would need to be reconstructed as an underground line along the proposed realigned State Route 38 right-of-way. Undergrounding through the proposed tract would leave a short section of exiting line overhead. This overhead section would need to be investigated to determine if it would also need to be placed underground. The determination of whether this overhead section would be placed underground would be dependent upon the technical electrical transmission capabilities of the line to be determined by BVES, and compliance with Caltrans and County of San Bernardino regulations pertaining to electrical facilities along State Routes.

BVES anticipates that impacts related to short-term construction, such as possible disruption of service, would be minimal. Additionally, tap lines to serve individual lots would be made under BVES' tariff rules 15 and 16. Any relocation or addition of new electrical facilities and other related costs would be funded for by the Applicant. Since, BVES operates under tariff rules set by the CPUC, all Project-related costs would also fall under those tariff rules. All costs would be incurred by having to maintain the existing level of service to existing BVEC customers, while adding new load to the system. As mentioned above, a new distributed generation option could be required. If this is determined, placement of a generator would need to be placed on a parcel within the development or on a parcel provided by the developers.

Based on the above discussion, electrical service would potentially be impacted by the proposed Project and new facilities would be required. However, the Project Applicant would be required to pay all costs/fees for the expansion of existing facilities and/or construction of new facilities to maintain the existing level of service to existing BVEC customers, while adding new load to the system. Payment of BVES fees/costs would mitigate all potential impacts less than significant levels in this regard.

[17] Source: Written correspondence from Marc Abraham, Engineering Supervisor, at Bear Valley Electric Service. July 2, 2002.

CUMULATIVE

5.3-10 *Cumulative development could result in an increased demand for public services and an increase in the consumption rates for public utilities, potentially requiring expansions of the existing utility systems. The inability of water providers to confirm service on a project level would also result in significant and unavoidable cumulative impacts. Analysis has concluded that cumulative development for the remaining service and utility affects are subject to standards and requirements of reviewing agencies and no additional mitigation is recommended.*

In relation to the cumulative development outlined in Section 4.0, *Basis for Cumulative Analysis*, the proposed Project would cumulatively contribute to an increased demand for fire, police, schools, libraries, water, sewer, solid waste, and energy utilities. The proposed Project and related projects would add to the cumulative demand for such services through the introduction of new residents, tenants, and users of the proposed facilities. The site is located in an area that is served by utilities and other public services. With the exception of water services, existing facilities can be readily extended into the area to serve the proposed development. Water providers have not been able to confirm service to the project, thus, it is concluded that cumulative impacts would also be significant and unavoidable for water service.

No additional governmental services or activities would be cumulatively impacted by the proposed Project. With the exception of water service, since the respective providers of services and facilities have indicated that the Project's incremental impacts can be sufficiently mitigated, cumulative impacts on public services and utilities, other than water services, that are anticipated to result from this development are not considered to be significant.

MITIGATION MEASURES

This section directly corresponds to the identified Impact Statements in the impacts subsection.

FIRE PROTECTION

5.3-1a The fire flow requirement shall be 1750 gpm @ 2 hours based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm @ 2 hours for homes greater than 4,800 square feet.

5.3-1b ~~Fire sprinklers for each residence shall be provided in lieu of additional manpower.~~ All residences less than 5,000 square feet shall be subject to the standard fire sprinkler requirement (NFPA 13D). Homes above 5,000 square feet shall be subject to the NFPA13R~~have a larger~~ sprinkler requirement ~~(FPA13R)~~.

5.3-1c A ~~f~~Fuels ~~modification program~~Management Plan, with specifications, shall be prepared and subject to approval by the County of San Bernardino Fire Department and San Bernardino National Forest Service. The Fuels

Management Plan shall implement the fire safety requirements of the FS1 Fire Safety Overlay District, including a 30-foot minimum setback requirement from the National Forest. The fuel modification zone shall be located entirely within the project's boundaries. ~~The 100 foot fuel modification requirement shall not terminate at a property line. The 100 foot fuel modification requirement shall extend beyond property lines. Where such fuel modification zone extends onto U.S. Forest Service land, an easement or permit shall be required to be obtained.~~ The minimum~~100 foot~~ fuel modification zone requirements may be greater in steeper areas (up to 300 ft.), as determined by the Fire ~~Agency~~ Department.

5.3-1d Cul-de-sac lengths shall be no longer than 350 feet.

5.3-1e A Homeowner's Association or a Special District shall be established to ~~assure~~ implement the Fuels Management Plan. The Fuels Management Plan shall specify any professional assistance, if necessary, to implement the action portion of the plan. The Plan shall determine if a Registered Professional Forrester is necessary for professional guidance to implement the Plan. ~~Long-term vegetation maintenance. An annual vegetation maintenance program shall be included.~~ The HOA or Special District is to be responsible for fuel modification in common areas.

~~5.3-1f Fire resistance/drought tolerant landscaping shall be required and referenced in the Homeowner's Association or Special District Standards.~~

POLICE PROTECTION

5.3-2 No mitigation measures are recommended.

SCHOOLS

5.3-3 No mitigation measures are recommended.

LIBRARIES

5.3-4 No mitigation measures are recommended.

WASTEWATER

5.3-5a Prior to issuance of building permits, the Project Applicant shall fund all on-site and off-site sewer improvements required to support development of the Project site. Such improvements shall be to the satisfaction of the BBARWA, and may include replacement of existing sewer lines rather than construction of parallel lines.

5.3-5b Prior to issuance of building permits, the Project Applicant shall provide evidence to the County of San Bernardino that the BBARWA has sufficient transmission and treatment plant capacity to accept sewage flows from the Project site.

5.3-5c The Project Applicant shall relocate the BBARWA 10" force main by installing new pipe (and/or bonding for the relocation) so that it is aligned within the south shoulder of the relocated State Route 38. The 10" force main shall be accessible for BBARWA to maintain and repair the sewer force main. The force main shall not pass through residential lots within the proposed tract.

5.3-5d The Project Applicant shall install air release valves and vaults at high elevation points on the new force main to minimize odors. Air release valves shall be large enough to enclose 55-gallon drum carbon filters to control odors.

WATER

5.3-6a ~~Prior to approval of building permits, a video inspection of water supply casings and screen shall be conducted in order to update~~ Values of production rates and pumping levels for on-site water supply wells shall be obtained through step-drawdown and constant rate pumping tests. Water samples shall be taken during the inspection for testing and analysis in accordance with standard requirements.

5.3-6b If either or both of the two existing on-site wells are utilized as a water source for the project, ~~T~~the Project Applicant shall equip the~~two existing on-site~~ wells to meet DWP and/or County Special Districts Department standards and dedicate these facilities and water rights to the appropriate water purveyor~~County of San Bernardino~~. Within the proposed tract, no individual private irrigation wells shall be permitted.

5.3-6c ~~If served by CSA 53-C through a contract with the City of Big Bear Lake Department of Water and Power, t~~ After a determination has been made regarding the water purveyor, the Project Applicant shall advance fair-share funds ~~or enter into a reimbursement agreement with the~~ to the appropriate water agency (CSA and/or DWP)~~(if required)~~ towards constructing a new reservoir and pipeline improvement at Cline-Miller Reservoir (with an estimated project cost at $481,100). These facilities would be dedicated to the appropriate water agency.

5.3-6d The following water conservation measures are the minimum measures that shall be complied with in conjunction with domestic water supply to the project. A Homeowners Association shall be responsible for enforcing the water conservation measures. Additional measures may be imposed as a result of a contract for water supply between CSA 53-C and the City of Big Bear Lake DWP:

- Landscape shall not be irrigated between the hours of 9:00 a.m. and 6:00 p.m.
- Residences, buildings and premises shall be limited to watering every other day.

- Landscape irrigation shall be limited to what is needed and shall not be excessive. Water from landscape irrigation shall not be allowed to run off into streets.

- Water shall not be allowed to leak from any waterline, faucet, or any other facility, either within or outside a private residence, business establishment or on private property. All such leaking waterlines, faucets, and other facilities shall be repaired immediately to prevent leakage.

- Sidewalks, paved driveways, and parkways shall not be washed off with hoses, except as required for sanitary purposes.

- Non-commercial washing of cars, and boats or any other vehicle shall only be done with an automatic shut-off nozzle on a hose, or with a bucket.

- New landscaping shall not exceed more than one-thousand square feet of turf on a parcel or lot or twenty-five percent of the available landscape area.

- A model landscaping and irrigation guide shall be prepared for the tract and required by homeowner association rules. The guide shall specify a plant palate that emphasizes native plants and cultivars that are suitable for the mountain climate. Plant materials shall be low water consuming and fire resistant. Irrigation shall emphasize drip and bubbler type emitters with limit aerial spray irrigation methods. The guide shall be reviewed and approved by the Land Use Services Department.

SOLID WASTE

5.3-7 No mitigation measures are recommended.

NATURAL GAS

5.3-8 No mitigation measures are recommended.

ELECTRICITY

5.3-9 No mitigation measures are recommended.

CUMULATIVE

5.3-10 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Due to the inability of water providers to confirm service to the project, project as well as cumulative impacts are concluded as significant and unavoidable. This

conclusion is further supported by the significant and unavoidable conclusion cited in Section 5.11, *Hydrology and Drainage*, due to inconclusive testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit.

If the County of San Bernardino approves the project, the County shall be required to adopt findings in accordance with Section 15091 of the CEQA Guidelines and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the CEQA Guidelines.

No additional unavoidable significant impacts related to public services and utilities have been identified following implementation of the recommended mitigation measures and compliance with applicable County, service or utility provider requirements, County Codes and Ordinances.

5.4 AESTHETICS/LIGHT AND GLARE

Visual resources information for this Section was compiled from site photographs and site surveys conducted by RBF Consulting in February 2002. This analysis is based upon reference data from the County of San Bernardino and the Project Applicant. The purpose of this Section is to describe the existing aesthetic environment on-site and in the site vicinity and analyze potential project impacts to the aesthetic character of the site. Consideration of public scenic vistas and views, impacts to scenic resources and the introduction of new sources of light and glare are also included in this Section. Visual simulations are provided to assist in the analysis. Mitigation measures are recommended to reduce the significance of impacts.

EXISTING CONDITIONS

VISUAL SETTING/CHARACTER

ON-SITE

The Moon Camp project site is adjacent to the north shore of Big Bear Lake in the relatively undeveloped eastern portion of the Community of Fawnskin. Generally, the site slopes from the south (lakefront) to the north (north of State Route 38/North Shore Drive). Elevations and slope degrees significantly increase from the central portions of the site to the northern boundary. Elevations range from 6,747 feet at the lakefront to a high of 6,960 feet at the northeast boundary. Total relief is 483 feet and slopes range from 5 percent to 40 percent.[1] The estimated 2,772 Jeffrey pine trees on-site provide a forested nature for the site. A variety of flora and fauna exist on-site, including Jeffrey pine forest, pebble plain habitat, birds, mammals, reptiles, amphibians, etc. (refer to Section 5.8, *Biological Resources*). On-site conditions include the State Route 38 right-of-way; two non-operational water wells; dirt roads and numerous footpaths/trails. No rock outcroppings occur within the project area. According to the San Bernardino County General Plan, the site is within a Scenic Resources (SR) Overlay District (see discussion which follows). Exhibits 5.4-1a and 5.4-1b, *Existing Conditions Photos*, contain photographs of typical site conditions.

As referenced in the San Bernardino County General Plan, the County designates the segment of State Route 38 that traverses the site as a "Scenic Highway."[2] Scenic highways are subject to additional land use and aesthetic controls under the County's Scenic Highway Overlay (refer to discussion under *Scenic Corridors* below). Additionally, the U.S. Forest Service designates State Route 38 as a "Scenic Byway." State Route 38 traverses the southern portion of the site in an east/west direction. Generally, the highway meanders through the site in a winding fashion and parallels the lakefront. The location of the highway allows travelers to have ample views of the lake in some areas (refer to Exhibit 5.4-1a, *Existing Conditions Photos*, View No. D). The meandering nature of the highway causes reduced vehicle speeds; thus, allowing vehicle passengers increased viewing time of

[1] Source: *Geologic Feasibility Report*, RGS Geosciences, May 3, 2001.

[2] Source: San Bernardino County General Plan, Section II, C, 5, Policy OR-58.

the lake. It is further noted that the narrow shoulder along the highway provides limited parking areas to view the lake.

Views to the north of State Route 38 consist primarily of dense collections of Jeffrey pine trees and associated vegetation interspersed with vacant areas of land. The view depicted in Exhibit 5.4-1a, *Existing Conditions Photos*, View No. A, from State Route 38, looking north, shows existing vegetation and slope of the mountainside. Southerly views from State Route 38 include the lakefront and long-range views to the mountains south of Big Bear Lake. The Bear Mountain and Snow Summit ski resorts are visible to the south of Big Bear Lake. Exhibits 5.4-1a and 5.4-1b, View No. E and View No. K, show views of the lakefront and long-range views to the distant mountains from State Route 38. The lakefront in the vicinity of the site consists primarily of vacant land and sporadic Jeffrey pine trees and associated vegetation.

Single-family residences located along Flicker Road (approximately 12 residences), Oriole Drive (approximately three residences) and State Route 38 (approximately 15 residences), adjacent to the north, east and west of the property, respectively, can be observed from the segment of State Route 38 that traverses the project site (refer to Views Nos. A, G, and J in Exhibits 5.4-1a and 5.4-1b). Exhibit 5.4-1a, View No. C, shows the view looking southerly from north of State Route 38. View No. B depicts a typical view of Jeffrey pine trees and associated vegetation on the project site.

OFF-SITE

As previously stated, existing single-family residences are located along Flicker Road, Oriole Lane and State Route 38, adjacent to the north, east and west of the site, respectively. Views of the site from residences along Oriole Lane and State Route 38 consist primarily of dense collections of Jeffrey pine trees interspersed with vacant areas of land. Exhibit 5.4-1a, View No. F, show views of the project site from Oriole Lane. Residences to the north of the site, along Flicker Road, are located at elevations higher than the site. Long-range views from Flicker Road across the site consist of Big Bear Lake and mountain ranges to the south of the lake. The long-range views are at times limited by the size and location of existing Jeffrey pine trees. Exhibit 5.4-1b, View Nos. H and I, show views along Flicker Road to the site. Views from Polique Canyon Road, adjacent to the northeast corner of the site, are similar to those of the residents located along Flicker Road. It is noted that there are no residences along this portion of Polique Canyon Road. Exhibit 5.4-1b, View No. L, shows the view from Polique Canyon Road to the site.

Views from Big Bear Lake toward the project site consist primarily of limited Jeffrey pine trees and vacant undeveloped land on the lakefront and dense collections of Jeffrey pine trees interspersed with vacant land on the gently sloping mountainside.

A From State Route 38, looking north. Existing vegetation and slope of mountainside.

B View of Jeffrey Pine trees and associated vegetation on the project site.

C Looking southerly from north of State Route 38 across the project site.

D View to the east along State Route 38.

E Looking south westerly from State Route 38 across the lake.

F Views of the project site from Oriole Lane located to the west of the project site.

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G Looking westerly from State Route 38 to residences west of the project site along Oriole Lane.

H Look southerly across the site from Flicker Road.

I Looking southerly across the project site from Flicker Road.

J Looking easterly from State Route 38 to residences east of the project site along State Route 38.

K Looking easterly from State Route 38 across the lakefront.

L Looking southwesterly from Polique Canyon Road across the project site.

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SCENIC CORRIDORS

As previously stated, the County of San Bernardino General Plan identifies the Moon Camp site within a Scenic Resources (SR) Overlay District and State Route 38 as a Scenic Highway. State Route 38 is also designated by the U.S. Forest Service as a Scenic Byway. The intent of the SR Overlay District is "to provide development standards that will protect, preserve and enhance the aesthetic resources of the County."[3] The SR Overlay District also implements state and federal programs regarding scenic highway routes.

The provisions of the SR Overlay District apply to: (a) areas with unique views of the County's desert, mountain and valley areas or any other aesthetic natural land formations; and/or (b) an area extending two-hundred (200) feet on both sides of the ultimate right-of-way of State or County designated Scenic Highways as set forth in the County General Plan. The area covered may vary to reflect the changing topography and vegetation along the right-of-way.

Per the provisions of the SR Overlay District, the following development standards/ criteria are utilized to evaluate compliance with the intent of the SR Overlay District:

- Building and Structure Placement. The building and structure placement shall be compatible with and should not detract from the visual setting or obstruct significant views.

- Review Area. The proposed project shall be designed to blend into the natural landscape and maximize visual attributes of the natural vegetation and terrain. Project design should also provide for the maintenance of a natural open space parallel to and visible from the right-of-way.

- Access Drives. Right-of-way access drives should be minimized.

- Landscaping. The removal of native vegetation, especially timber, shall be minimized and replacement vegetation and landscaping shall be compatible with the local environment and, where practicable, capable of surviving with a minimum of maintenance and supplemental water. Landscaping and plantings should not obstruct significant views, either when installed or when they reach mature growth.

- Roads, Pedestrian Walkways, Parking and Storage Areas. Any large scale development should restrict the number of access points by providing common access roads. Parking and outside storage areas should be screened from view, to the maximum extent possible, from a Scenic Highway, by the placement of buildings and structures, or by landscaping and plantings which are compatible with the local environment, and, where practicable, are capable of surviving with a minimum of maintenance and supplemental water.

[3] County of San Bernardino Development Code, Title 8, Division 5, Chapter 3, Article 6, Section 85.030601. Page 5-69. July 1, 1989.

- Above Ground Utilities. Utilities shall be constructed and routed underground except in those situations where natural features prevent the underground siting or where safety considerations necessitate above ground construction and routing. Above ground utilities shall be constructed and routed to minimize detrimental effects on the visual setting of the designated area. Where it is practical, above ground utilities shall be screened from view of the Scenic Highway by existing topography, or by placement of buildings and structures.

- Grading. The alteration of the natural topography of the site shall be minimized and shall avoid detrimental effects to the visual setting of the designated area and the existing natural drainage system. Alterations of the natural topography should be screened from view from either the scenic highway or the adjacent scenic or recreational resource by landscaping and plantings which harmonize with the natural landscape of the designated area, and which are capable of surviving with a minimum of maintenance and supplemental water.

- Signs. Primary freestanding signs greater than eighteen (18) square feet are prohibited in the SR Overlay District.

LIGHT AND GLARE

Due to the undeveloped nature of the project site, no light or glare is currently generated on the project site. Headlight glare from vehicles traveling along State Route 38 may be visible from the project site.

IMPACTS

SIGNIFICANCE CRITERIA

Appendix G, *Initial Study Checklist*, of the California Environmental Quality Act (CEQA) Guidelines includes checklist questions relating to aesthetics. A project would potentially create a significant aesthetic impact if it caused one or more of the following to occur:

- Have a substantial adverse effect on a scenic vista (refer to Impact Statements 5.4-2 and 5.4-3);

- Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway (refer to Impact Statement 5.4-3);

- Substantially degrade the existing visual character or quality of the site and its surroundings (refer to Impact Statement 5.4-1 to 5.4-4); and/or

- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area (refer to Impact Statement 5.4-1 and 5.5-4).

The evaluation of aesthetic impacts can be termed a subjective exercise due to widely varying personal perceptions. Nevertheless, replacement of undeveloped land with residential uses and realignment of State Route 38 would permanently alter the appearance and character of the project area. Potential impacts are categorized below according to topic. Mitigation measures at the end of this Section directly correspond to the numbered impact statements below.

SHORT-TERM AESTHETIC/LIGHT AND GLARE IMPACTS

5.4-1 *Construction of the proposed project would temporarily alter the visual appearance of the site and introduce new short-term sources of light and glare. Analysis has concluded that impacts would be reduced to less than significant levels with implementation of the recommended mitigation measures.*

The proposed project would involve grading for new roads, including the realignment of State Route 38, and installation of utilities. Construction of the realigned portion of State Route 38 would take approximately 4 to 6 months. Future residences would be constructed on the site on a lot-by-lot basis. Project construction activities would disrupt views across the site from surrounding areas. Graded surfaces, construction debris, construction equipment and heavy truck traffic would be visible. Soil would be stockpiled and equipment for grading activities would be staged at locations throughout the site. Construction impacts would be relatively short-term and would cease upon project completion. With the implementation of the recommended mitigation pertaining to location of staging areas and screening, short-term impacts would be reduced to less than significant levels. In addition, construction activities would be required to be consistent with the permitted hours of construction as set forth by the County of San Bernardino (refer to Section 5.7, *Noise*, with regard to permitted hours of construction).

Short-term light and glare impacts are associated with construction activity and would likely be limited to night-time lighting necessary for security purposes. Relative to potential short-term construction impacts, there are three areas adjacent to the site upon which the proposed project may pose night-time lighting impacts. The residences located along State Route 38, near the southern portion of the site, the residences located along Oriole Lane, and the residences along Flicker Road could be impacted by night-time and security construction lighting. This is considered a short-term impact and would require mitigation. Mitigation measures pertaining to construction-related lighting would reduce these short-term impacts to less than significant levels.

LONG-TERM AESTHETIC IMPACTS

5.4-2 *Implementation of the Moon Camp project would adversely impact scenic resources, scenic vistas and the visual character of the site and its surroundings. Analysis has concluded that a significant and unavoidable impact to the visual character and viewshed from the project site and surrounding areas would occur which cannot be mitigated to a less than significant level.*

With development of the proposed project, the viewshed and visual characteristics of the area would be permanently modified. Currently, the project site consists primarily of forest lands, State Route 38 (North Shore Drive), two non-operational water wells and numerous dirt roads and trails. The heart of the Fawnskin Community is located to the west of the project site, which consists primarily of a variety of custom-built residences. With the introduction of 92 residential lots, local streets and associated infrastructure, current viewshed characteristics would be modified and in some cases dominate the visual features of the project area. Distant views of the mountain ranges and Big Bear Lake to the south would be affected by the proposed use. The project would also involve the removal of approximately 655 or 24 percent of the existing Jeffrey pine trees for roadway construction. Additional tree removal may occur during individual lot development and construction of custom homes; the design of which is not part of the proposed project.

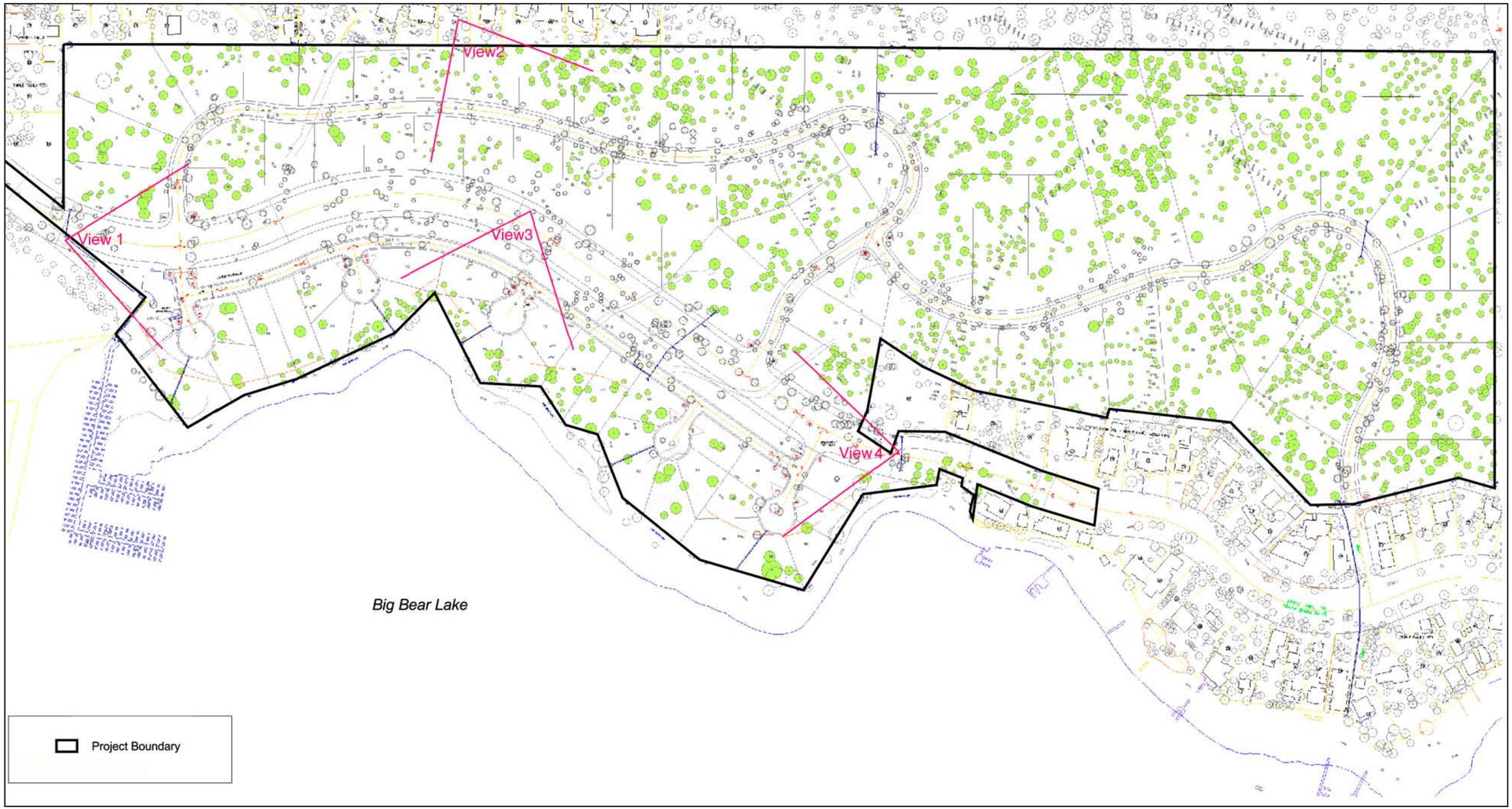
The alteration of the area would be permanent and would continue throughout the life of the project. As discussed below, based upon the density of the proposed residential uses south of the realigned State Route 38 and view simulation data, it is concluded that viewshed characteristic impacts from the interior of the project site and surrounding uses to the north, east and west of the project are significant and unavoidable, given the current characteristics of the area.

The following sections include a discussion of the views across the project site, views of Big Bear Lake and views of distant mountain ranges, with implementation of the Moon Camp development. Exhibits and simulations are provided that have been utilized to conduct the viewshed analysis which includes: Exhibit 5.4-2, *View Map* (showing the field of view for each simulation); Exhibit 5.4-3, *Plan View;* Exhibit 5.4-4, *View East of State Route 38;* Exhibit 5.4-5, *View South from Proposed Realignment of State Route 38;* Exhibit 5.4-6, *View West from State Route 38;* and Exhibit 5.4-7, *View South from Flicker Road*. The exhibits and simulations present an anticipated development scenario, thus, they are not representative of architectural design and final development plans for the placement of new residences. The analysis is based upon buildout of the 92 residential lots, the realignment of State Route 38 and construction of a 100 boat slip marina facility.

The aesthetic value can be subject to interpretation and can be debated to a certain extent. Nevertheless, based upon a defined threshold of change in visual character, the proceeding sections have concluded a significant and unavoidable impact that cannot be mitigated for view areas to the north, south, east and west of the site and from the south shore of Big Bear Lake.

VIEWS TO PROJECT SITE

Views from West. The heart of the Community of Fawnskin is located to the west of the project site. Single-family residential units are situated along Oriole Lane, immediately west of the project site. Long-range views from Oriole Lane and State Route 38, to the Lake and distant mountain ranges are currently partially obstructed by dense collections of Jeffrey Pine trees. Exhibit 5.4-1a, View No. F, indicates that



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View Map

Exhibit 5.4-2

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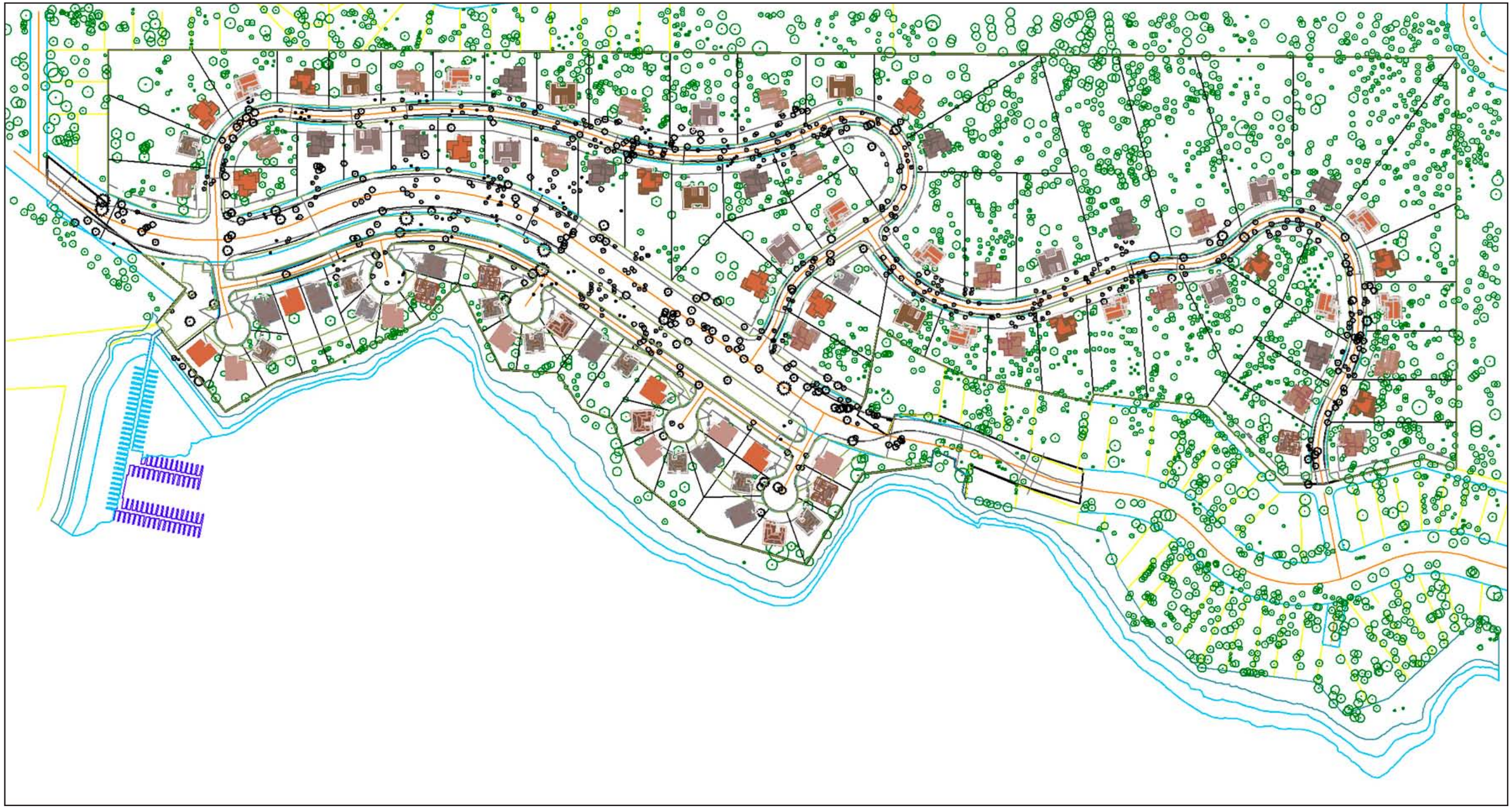

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Plan View

Exhibit 5.4-3

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Existing View

Simulated View

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View East from State Route 38

Exhibit 5.4-4

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Existing View

Simulated View

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View South from Proposed Realignment of State Route 38

Exhibit 5.4-5

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Existing View

Simulated View

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View West from State Route 38

Exhibit 5.4-6

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Existing View

Simulated View

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View South from Flicker Road

Exhibit 5.4-7

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View East from State Route 38, depicts a view of the project site from the eastern portion of the project site. The view simulation indicates a substantial change in the visual character of the site. It is evident that removal of trees associated with the roadway realignment would reduce the forested nature of the project site.

Furthermore, the introduction of residences along the lakefront would partially disrupt short- and long-range views of the Lake and the distant mountain ranges.

Implementation of the project would also involve the construction of a 100 boat slip marina facility. The marina facility would not alter long-range views of the distant mountain ranges, generally located in a southerly direction, but would alter the visual character of the Lake by introducing a man-made structure on the lakefront and removal of several trees for parking facilities. Since both long- and short-range views to the southeast would be altered with new residences on the lakefront and the visual character of the project site and Lake would be altered by a reduction in tree density, it is concluded that long-term aesthetic impacts to residents located west of the project site are significant and unavoidable.

Views from East. For purposes of this analysis, views in this subsection are considered for residences along State Route 38 to the east of the site. Implementation of the proposed project would not alter southerly views of the Lake for residences situated between the Lake and the south side of State Route 38, as short- and long-range views of the Lake and the distant mountain ranges would remain unobstructed. However, short- and long-range views of the lake and distant mountain ranges to the west would be altered with the construction of new lakefront residences. Exhibit 5.4-6, *View West from State Route 38*, indicates a view of the project site from the western portion of the project site. The view simulation indicates a substantial change in the visual character of the site. It is evident that removal of trees associated with the roadway realignment would reduce the forested nature of the project site. Additionally the new residences along the lakefront would obstruct the short- and long-range views to the lake and distant mountain ranges.

Currently, existing residents north of State Route 38 have views of the Lake and distant mountain ranges that are obstructed by the residences situated along the lakefront (south side of State Route 38). However, the residences on the north side of State Route 38 are at a higher elevation than the existing lakefront homes. Thus, partial views of the lake are available at various locations. These residents would maintain partial views of the Lake to the immediate south, with implementation of the Project. As indicated in Exhibit 5.4-6, views of the lake and distant mountain ranges to the southwest and west would be obstructed with the construction of new lakefront residences. Furthermore, the removal of trees associated with the roadway realignment would reduce the forested nature of the project site.

Since both long- and short-range views to the southwest would be obstructed with new residences on the lakefront and the visual character of the project site and Lake would be altered by a reduction in tree density, it is concluded that long-term aesthetic impacts to residents located east of the project site are significant and unavoidable.

Views from the South. Views across the Lake from the south shore and the Lake itself to the north shore consist primarily of mountainsides covered in dense forest vegetation, with small areas of sporadic developed areas, such as the Community of Fawnskin. As shown in Exhibit 5.4-3, *Plan View*, the majority of the existing Jeffrey pine trees located between the high-water line of the Lake and immediately adjacent to or on the southern boundary of the project would remain. The lakefront residences, and residences to the north, would be partially screened by the existing trees when viewed from the south. The potential size and massing of residential buildings and change in visual character of the lake from the proposed marina facility (marina facility discussed in "views from west") would constitute a significant and unavoidable impact for views across the lake, from the south shore, and the lake itself to the north.

Views from the North. Views in this subsection are considered for those residents located along Flicker Road to the north of the project site. Exhibit 5.4-7, *View 2 – View South from Flicker Road*, is a simulated view looking south across the project site. The view simulation shows the project site at full build-out. Flicker Road is located at a higher elevation than the project site, as the mountainside slopes considerably from Flicker Road to the lakefront. The simulated view indicates a substantial change to the visual character and views, as compared to the existing view. It should be noted that the simulation utilized large, two-story homes to present a worst-case scenario to determine obstruction of views. The construction of new residences to the south of Flicker Road would partially obstruct views from existing Flicker Road residences to the lake and distant mountains. Additionally, the relocation of State Route 38 would involve the removal of Jeffrey Pine trees located adjacent to the current roadway alignment and future home sites. The removal of such trees would diminish the forested nature of the site. However, the removal of the trees may also enhance views of the Lake for some residents along Flicker Road. Since the views to the south of the Lake and distant mountain ranges would be altered and viewshed characteristics would be permanently changed, impacts are concluded as significant and unavoidable.

LONG-TERM SCENIC HIGHWAY IMPACTS

5.4-3 *Implementation of the Moon Camp project would impact views of Big Bear Lake, the distant mountain ranges to the south and adjacent forest areas from North Shore Drive (State Route 38) which is a County and Federally recognized Scenic Highway/Byway. Analysis has concluded that significant and unavoidable impacts would occur as a result of project development.*

With development of the proposed project, viewshed and visual characteristics along State Route 38 would be permanently modified. Currently, State Route 38 is the only visible on-site improvement. With the introduction of 92 residential lots, local streets and associated infrastructure, and a 100 boat slip marina facility on Big Bear Lake, current viewshed characteristics would be modified and in some cases dominate the visual features along State Route 38. Distant views of the mountain ranges and Big Bear Lake to the south would be affected by the proposed uses.

The alteration of the area would be permanent and would continue throughout the life of the project. Based upon the density of the proposed residential uses south of the realigned State Route 38 and view simulation data depicted in Exhibits 5.4-4, *View East from State Route 38*, Exhibit, 5.4-5, *View South from Proposed Realignment of State Route 38*, and Exhibit 5.4-6, V*iew West from State Route 38*, it is concluded that viewshed characteristic impacts along State Route 38 looking south across the project site are significant and unavoidable, given the current characteristics of the area. Exhibit 5.4-2, *View* Map, indicates the field of view for each of the views presented in Exhibits 5.4-4, 5.4-5, 5.4-6 and 5.4-7. This analysis in based upon full build-out of the 95-lots (92 residences) associated with the project.

As stated in the Existing Conditions subsection, State Route 38 (North Shore Drive) is designated by the County of San Bernardino as a Scenic Highway. As such, the highway is subject to additional land use and aesthetic controls under the County's Scenic Highway Overlay District. The provisions of the Scenic Resources Overlay District are provided within the *Scenic Corridor* discussion above. The following describes the views across the project site from State Route 38 at various locations with buildout of the Moon Camp development. The discussion includes analysis that considers the provisions of the Scenic Resources Overlay District.

This portion of the analysis considers views for people utilizing State Route 38 and traversing the project site in an east/west direction. Exhibit 5.4-4, *View East from State Route 38*, is a simulated view from State Route looking east across the project site. Exhibit 5.4-6, *View West from State Route*, is a simulated view from State Route 38 looking west across the project site. As shown in the simulations, several Jeffrey Pine trees would be removed with realignment of State Route to the north. The building and structure placement of the homes on the northern side of the highway appear compatible with and do not substantially detract from the visual setting of the area or obstruct significant views, as the mountain slopes upward to the north.

The placement of homes was based on the regulations set forth in the County Development Code, including setback requirements, height limitations, lot coverage, etc. The homes shown in the simulations are at or near the maximum size allowed on each parcel. The design of the homes is reflective of the "newer" homes in the Fawnskin area.

The removal of native vegetation appears minimal and replacement vegetation would supplement the loss of natural vegetation. Utilities, parking and storage areas appear to be screened from view, to the maximum extent possible. Despite the necessary grading for construction of the local streets and custom-built homes, the site would maintain varying topography, which would maintain a mountain community setting.

Building and structure placement on the southern side of the Highway (lakefront properties), while appearing compatible with the visual setting on the north side of the Highway, results in obstructed views of the distant mountain ranges and immediate views of the Lake to the south. This is depicted in Exhibit 5.4-6, *View West from State Route 38*. As shown in Exhibit 5.4-6, upon entering the project area on State Route from the east, views of the Lake are obstructed.

In some cases, as shown in Exhibit 5.4-5, *View South from Proposed Realignment of State Route 38*, views of the Lake and distant mountains would be maintained. In Exhibit, 5.4-5, the existing view shows State Route 38, and is clearly evident that while traversing this section of the Highway, views of the Lake would be unobstructed. The location of the simulated view is from the north side of State Route 38, as realigned (refer to Exhibit 5.4-2, *View Map*). The simulated view shows that the realigned Highway would still provide views of the Lake, as the roadway would be located at a higher elevation compared to the existing alignment.

It is concluded that development on the north side of State Route 38 would not obstruct views of scenic vistas, nor would the construction of custom-built homes detract from the visual setting of the area. According to the provisions of the Scenic Resources Overlay District, the "Building and Placement" standard states that "the building and structure placement should be compatible with and should not detract from the visual setting or obstruct views." Since development on the south side of State Route 38 would disrupt Lake and distant mountain views to the south along State Route 38, the proposed project would not fulfill all of the Development Code standards such as building and structure placement not obstructing significant views, as outlined in the Scenic Resources Overlay District. Thus, significant and unavoidable impacts would occur as a result of the proposed project.

LONG-TERM LIGHT AND GLARE IMPACTS

5.4-4 *The proposed Moon Camp project would introduce additional light and glare on-site which may affect the surrounding residents. Analysis has concluded that potential impacts would be reduced to less than significant levels with implementation of the recommended mitigation measures.*

Long-term impacts are associated with the construction of new residences and street lighting, which may create nighttime light or daytime glare.

Night-time lighting impacts are significant when they interfere with or intrude into sensitive land use areas which include private residences and public access areas. Glare impacts can cause daytime interferences with activities at sensitive land use areas as defined above as well as public roadways where automobile drivers can be temporarily blinded by glare thus causing a safety concern. Residences to the east (along State Route 38) and west (along Oriole Lane) of the site would be partially shielded from new light sources by the existing Jeffrey Pine trees and associated vegetation. As indicated on Exhibit 5.4-3, *Plan View*, new residences located immediately south of Flicker Road would also be partially shielded from new sources of light by the existing Jeffrey pine trees. The *Plan* View presents an anticipated development scenario, thus, it is not representative of final development plans for the placement of new residences. The *Plan View* indicates that the new residences to the south of Flicker Road would likely be situated on the southernmost portions of the lots, thus, maximizing the distance to the existing residences located on Flicker Road. Implementation of the recommended mitigation measures would reduce potential impacts to less than significant levels.

Glare impacts are typically related to the use of modern, highly reflective surfaces such as gold, or silver glass, acrylic, and broad, flat surfaces that are painted with

highly reflective colors. A review of the visual simulations, renderings and the Site Plan indicates that the proposed residential subdivision would not cause significant glare impacts along State Route 38, Oriole Lane and Flicker Road. Although there are no proposed buildings or structures associated with the proposed project, the custom homes that would be built on the lots are not anticipated to incorporate highly reflective glass, or broad, flat surfaces. New residential development is anticipated to be consistent with existing residential structures in the local area and is subject to approval by the County of San Bernardino. The surrounding residences architectural theme consists of materials indicative of wood siding and traditional log homes. Future homes are anticipated to utilize similar architectural themes as seen in the existing Community of Fawnskin. Implementation of the recommended mitigation measures would reduce potential impacts to less than significant levels.

In addition, future residential development will be required to comply with the glare and outdoor lighting provision of the County of San Bernardino Development Code (i.e., Section 87.0921 et. seq.). The intention of this section is:

- To encourage effective, non-detrimental lighting;
- To maintain night time safety, utilizing security and productivity; and
- To encourage lighting practices and systems, which will minimize light pollution, glare and light trespass, conserve energy and resources and curtail the degradation of the night time visual environment.

CUMULATIVE

5.4-5 *Build-out of the Moon Camp development, together with cumulative projects, may alter the nature and appearance of the area and contribute to the loss of undeveloped areas. Analysis has concluded that no significant impacts beyond the analysis contained in the County of San Bernardino General Plan and General Plan EIR are anticipated.*

As development occurs throughout the Fawnskin area, residents and visitors in the area would notice the visual effects of development projects. However, the significance of these visual/aesthetic changes is difficult to determine, since aesthetic value is subjectively determined and potential impacts are site-specific. Construction of currently approved and pending projects in the vicinity would permanently alter the nature and appearance of the area through the loss of undeveloped areas. Security and street lighting would introduce light and glare potential to the area. Impacts are typically evaluated on a project-by-project basis. Cumulative impacts can be mitigated to less than significant levels with use of building materials that are consistent with the general character of the area, landscaping design, and proper lighting techniques to direct light on-site and away from adjacent properties.

MITIGATION MEASURES

The following mitigation measures directly correspond to the identified impact statements in the Impacts discussion.

SHORT-TERM AESTHETIC/LIGHT AND GLARE IMPACTS

5.4-1a Construction equipment staging areas shall be located away from existing residential uses. Appropriate screening (i.e., temporary fencing with opaque material) shall be used to buffer views of construction equipment and material, when feasible. Staging locations shall be indicated on project Grading Plans.

5.4-1b All construction-related lighting associated with the construction of new roadways, the realignment of State Route 38, and the installation of utilities shall be located and aimed away from adjacent residential areas. Lighting shall use the minimum wattage necessary to provide safety at the construction site. A construction safety lighting plan shall be submitted to the county for review concomitant with Grading Permit applications for the subdivision of the lots.

LONG-TERM AESTHETIC IMPACTS

5.4-2a Roof pitches shall not exceed 9/12 and no higher than two-story for any portion of the structure footprint for lots 62-92.

5.4-2b All homes shall provide a two-car garage with automatic garage doors.

5.4-2c A view envelope for each property shall be established by creating a line starting at 6 feet at each side lot line and moving up at a 30 degree angle until both lines meet at the middle of the property. The area located under these lines is the view envelope. Structures shall not protrude outside the view envelope. The view envelope orients the building ridgeline parallel to the view corridors on narrower lots providing views for residents located behind the property.

5.4-2d New development shall be subordinate to the natural setting and minimize reflective surfaces. Building materials including siding and roof materials shall be selected to blend in hue and brightness with the surroundings. Colors shall be earth tones, shades of grays, tans, browns, greens, pale yellows, and shall be consistent with the mountain character of the area.

5.4-2e Outside parking/storage areas associated with the boat dock activities shall be completely screened from view by the placement of landscaping and plantings which are compatible with the local environment and, where practicable, are capable of surviving with a minimum of maintenance and supplemental water.

5.4-2f Construction plans for each individual lot shall include the identification and placement of vegetation with the mature height of trees listed. Landscaping and plantings should not obstruct significant views, within or outside of the project, either when installed or when they reach mature growth. The removal of existing vegetation shall not be required to create views.

5.4-2g A Note shall be placed on the Composite Development Plan stating that during construction plans review and prior to issuance of building permits for each lot, the building inspector shall refer to the Mitigation Monitoring and Compliance Program regarding these aesthetic impact mitigation measures. The building inspector shall coordinate with the Advance Planning Division the review and approval of building plans in relation to these aesthetic impact mitigation measures, prior to approval and issuance of building permits.

LONG-TERM SCENIC HIGHWAY IMPACTS

5.4-3a Any entry sign for the development shall be a monument style sign compatible with the mountain character, preferably, rock or rock-appearance.

5.4-3b Prior to recordation of the tract map (and/or any ground disturbance, whichever occurs first), landscaping plans for lettered lots B and C shall be submitted to and approved by the San Bernardino County Planning Department.

LONG-TERM LIGHT AND GLARE IMPACTS

5.4-4a All exterior lighting shall be designed and located as to avoid intrusive effects on adjacent residential properties and undeveloped areas adjacent to the project site. Low-intensity street lighting and low-intensity exterior lighting shall be used throughout the development to the extent feasible. Lighting fixtures shall use shielding, if necessary to prevent spill lighting on adjacent off-site uses.

5.4-4b Lighting used for various components of the development plan shall be reviewed for light intensity levels, fixture height, fixture location and design by an independent engineer, and reviewed and approved by the County Building and Safety Division.

5.4-4c The project shall use minimally reflective glass. All other materials used on exterior buildings and structures shall be selected with attention to minimizing reflective glare.

5.4-4d Vegetated buffers shall be used along State Route 38 to reduce light intrusion on residential development and on forested areas located adjacent to the project site.

5.4-4e Mitigation Measures 5.4-4a through 5.4-4d shall be included within the Conditions, Covenants and Restrictions (CC&Rs) of the Home Owner's Association (HOA).

5.4-4f All outdoor light fixtures shall be cutoff luminaries and shall only use high- or low-pressure sodium lamps.

5.4-4g The Project Applicant/Developer shall install light colored, reflective roof products. Such roofs shall utilize light colored, reflective materials that meet the performance standards developed by the Energy Star Labeled Roof Program, as well as the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standards 90.1 and 90.2 on energy efficient buildings. This condition shall be verified by the County of San Bernardino Building and Safety Division prior to issuance of building permits.

CUMULATIVE

5.4-5 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Significant and unavoidable impacts related to Aesthetics/Light and Glare have been identified for viewshed alterations involving existing residents to the north, east and west of the project site. Additionally, significant and unavoidable impacts have been identified for views from State Route 38, a scenic highway, to the south and from the south shore of Big Bear Lake. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA.

No additional significant impacts related to Aesthetic/Light and Glare have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

5.5 TRAFFIC AND CIRCULATION

This Section is based upon the project Traffic Analysis prepared by Kunzman Associates, September 2003 (refer to Appendix 15.3, *Traffic Data*.) RBF Consulting conducted a peer review of the Kunzman Associates Study to confirm accuracy. The evaluation considers impacts to local roadways, intersections, regional transportation facilities and ingress/egress locations on-site. Mitigation measures are recommended to reduce impacts to less than significant levels.

EXISTING CONDITIONS

STUDY AREA STREET SYSTEM

Exhibit 5.5-1, *Highway Designations*, shows the common name, as well as the Highway number for each roadway in the study area. Roadways that would be utilized by the development include North Shore Drive, Stanfield Cutoff and Big Bear Boulevard. In the vicinity of the project site, the following roadway conditions exist:

- North Shore Drive. This east-west two-lane roadway, also referred to as State Route 38, currently has a peak monthly volume of 4,750 vehicles per day. North Shore Drive is the only on-site improvement. The roadway has a shoulder of varying widths that allows for emergency parking. There are no designated bike lanes on North Shore Drive, and there are no bus turnouts.

- Stanfield Cutoff. This north-south two-lane road currently has a peak monthly volume of 5,625 vehicles per day.

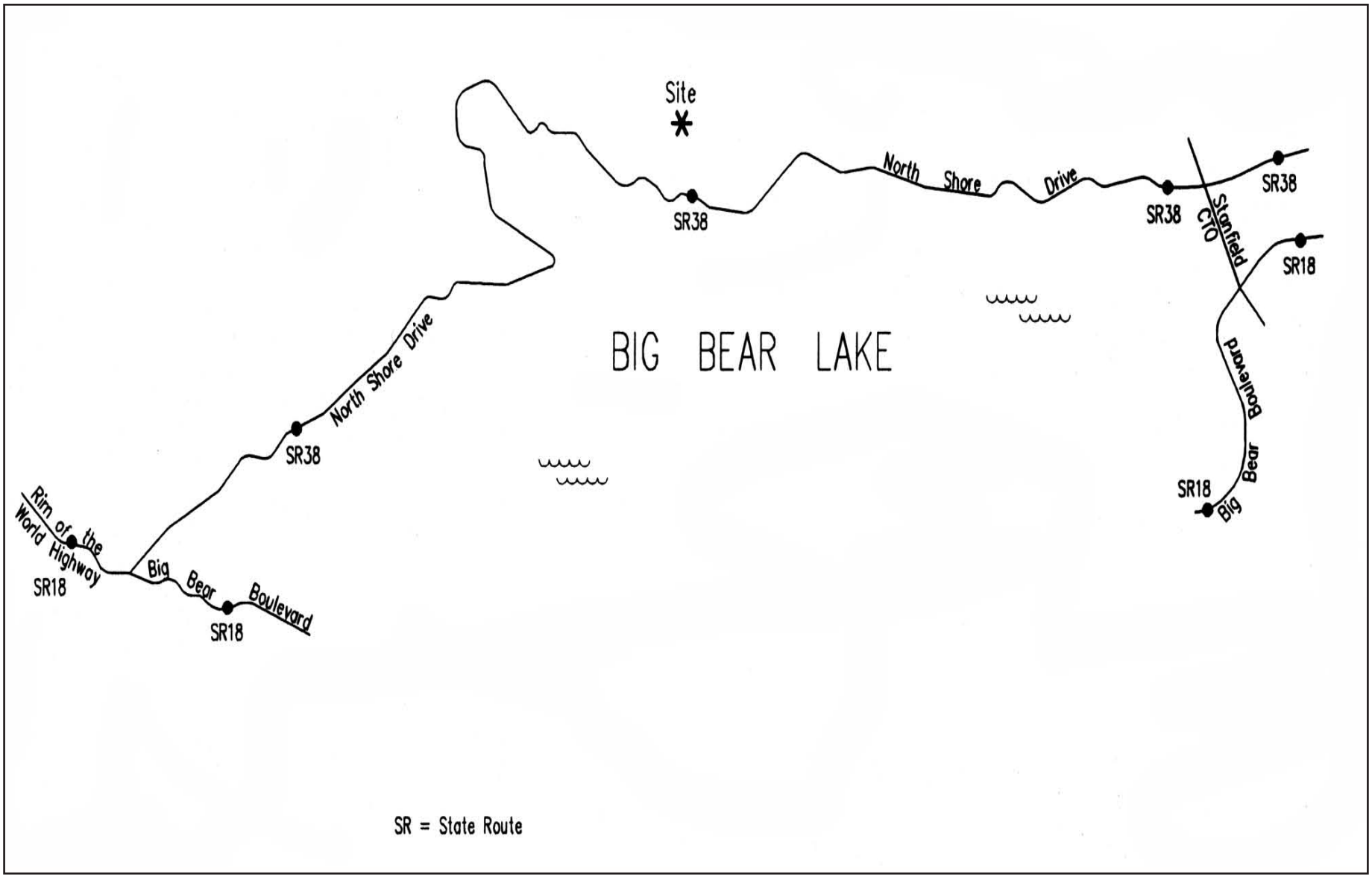
- Big Bear Boulevard. This east-west road, also referred to as State Route 18, consists of four lanes west of Stanfield Cutoff, and two lanes east of Stanfield Cutoff. It has a peak monthly volume of 20,500 vehicles per day, west of Stanfield Cutoff.

EXISTING TRAVEL LANES AND INTERSECTION CONTROLS

Exhibit 5.5-2, *Existing Through Travel Lanes and Intersection Control*, identifies the existing roadway conditions for highways near the site, the number of through lanes for existing roadways, and the existing intersection controls.

EXISTING DAILY TRAFFIC VOLUMES

Exhibit 5.5-3, *Existing Daily Traffic Volumes – Average Month*, and Exhibit 5.5-4, *Existing Daily Traffic Volumes – Peak Month*, depict the average and peak month daily two-way traffic volumes. Traffic volumes were obtained from the weekday peak hour intersection turning movement counts conducted by Kunzman Associates in March, 2001.



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-1

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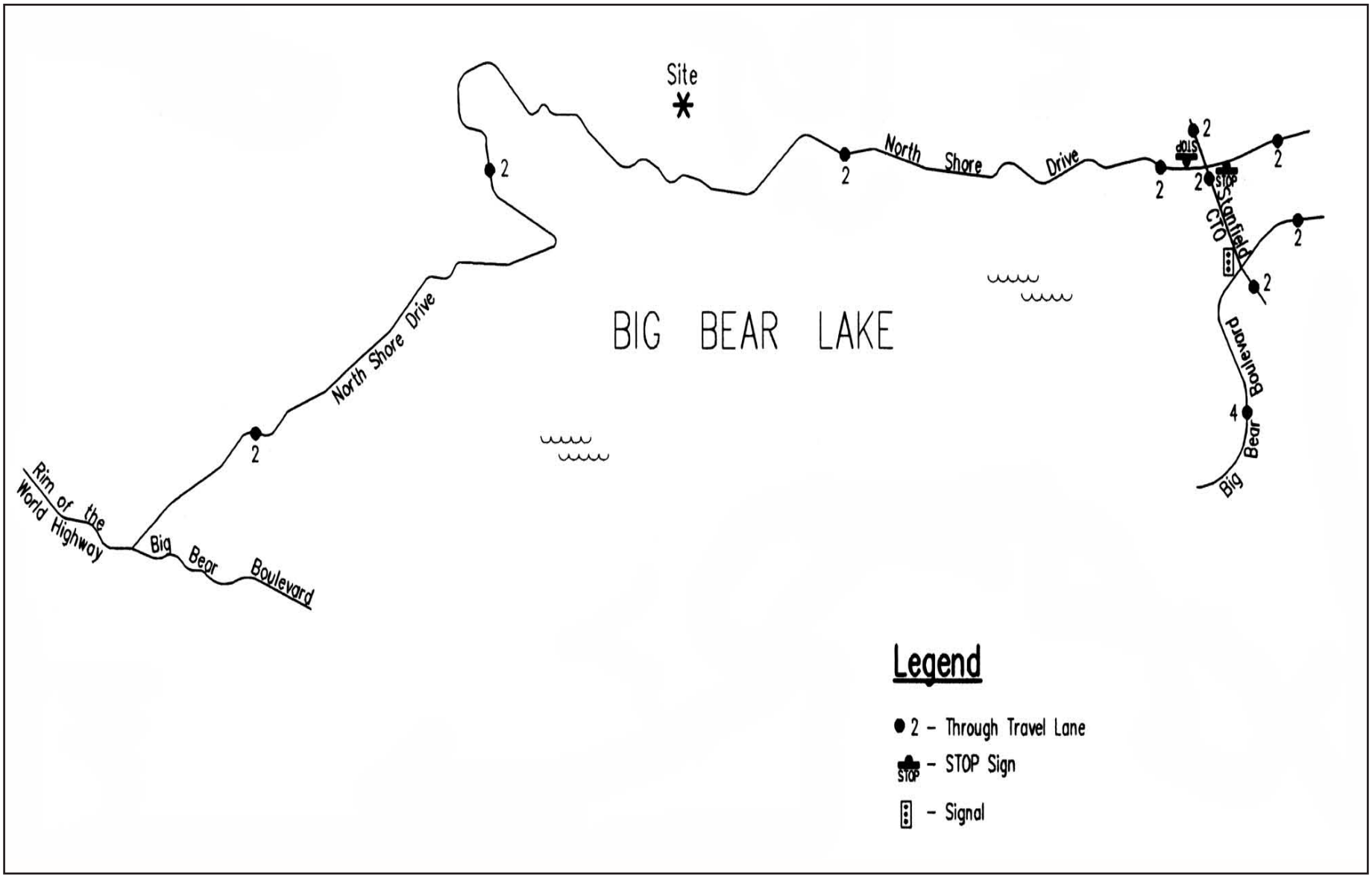
MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Highway Designations



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-2

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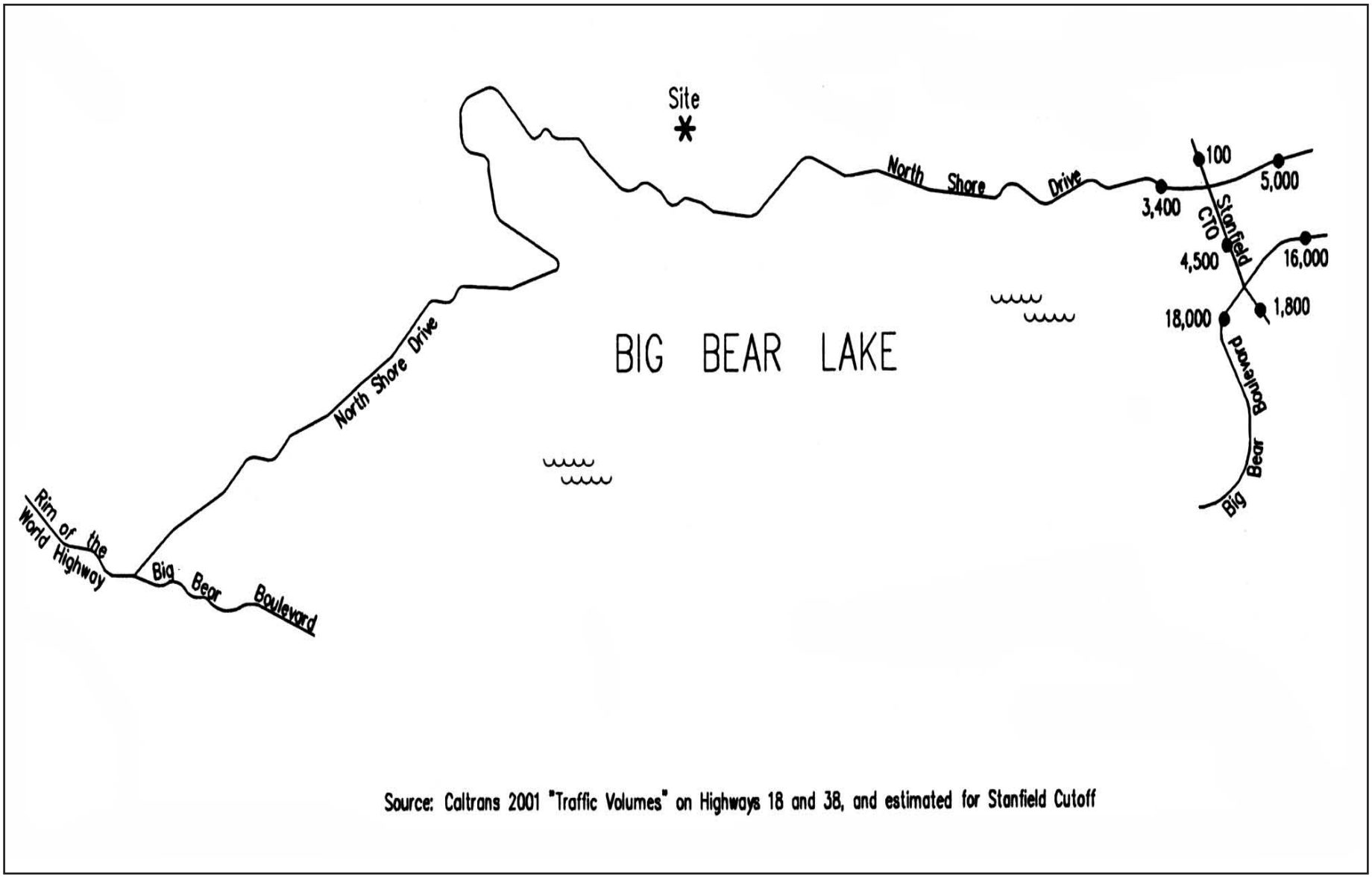
12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Existing Through Travel Lanes and Intersection Control



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-3

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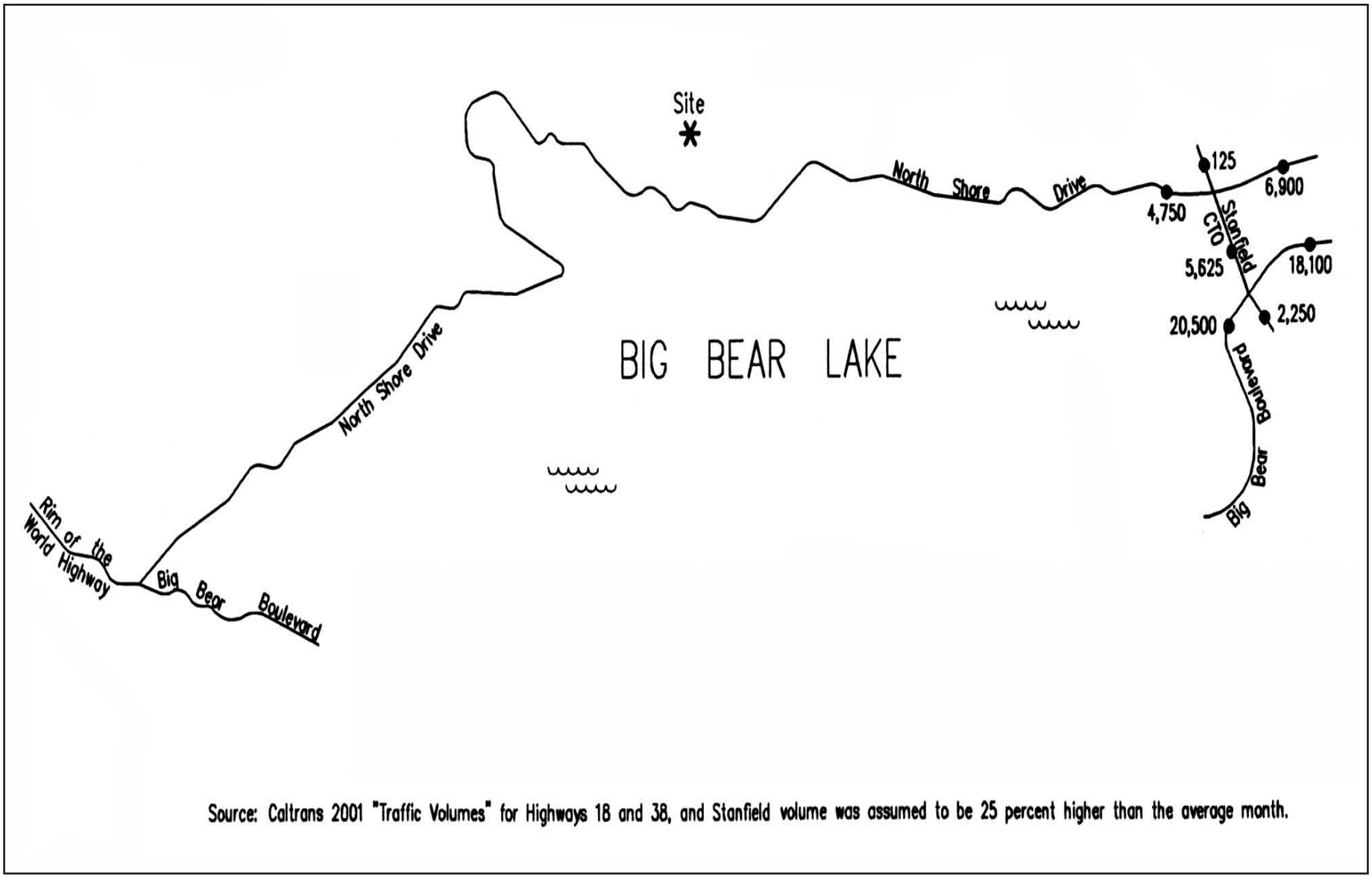
12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Existing Daily Traffic Volumes - Average Month



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-4

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12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Existing Daily Traffic Volumes - Peak Month

Table 5.5-1, *Determining Annual Growth Rates and Peak Month Factors*, shows daily traffic volumes, as reported by Caltrans in traffic volumes for state highways in 1989 and 1999. From this data, it has been determined by Kunzman Associates that a reasonable factor to convert typical month volumes to peak month volumes is 1.25.

The County of San Bernardino recommends a growth rate of 1.0 percent per year for the Big Bear area based on a recent analysis by the County. Typically an annual growth rate approach is better than a cumulative projects approach because the cumulative projects approach typically leads to double counted trips thus there is a compounding of errors consideration. The double counting occurs for instance when homes are proposed and the cumulative projects list includes a retail commercial center. The trip added from the home that goes to the store is the same trip added a second time from the store to the home. The compounding of errors leads to erroneous results when for instance in the case of residential the density is over estimated, then the trip generation is overestimated (this is particularly problematic in Big Bear where most houses are not inhabited full time, and then the trip distribution is overestimated in that the local trips are under reported and the longer trips are over reported. The County of Los Angeles uses the compounded growth rate approach. Also, it should be noted that the County of Riverside formerly used the compounded growth rate approach, then switched to the cumulative projects approach, and is now reconsidering going back to the compounded growth rate approach.

Year 2001 traffic volume estimates were obtained by factoring the sum of the morning and evening peak hour volumes. A factor of 5.5 was used. According to the Kunzman Associates report, this method of estimating daily traffic volumes produces reasonable results. Refer to Appendix B of the *Traffic Analysis* report for more details.

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES

Existing manual peak hour turning movement counts were conducted by Kunzman Associates in March 2001. Appendix C of the *Traffic Analysis* report contains plots of the peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

There are two peak hours in a weekday. The morning peak hour is between 7:00 a.m. and 9:00 a.m., and the evening peak hour is between 4:00 p.m. and 6:00 p.m. The actual peak hour within the two-hour interval is the four consecutive 15-minute periods with the highest total volume when all movements are added together. Thus, the evening peak hour at one intersection may be 4:45 p.m. to 5:45 p.m., if those four consecutive 15-minute periods have the highest combined volume.

EXISTING INTERSECTION LANES

Appendix B of the *Traffic Analysis* shows the number of existing through and turning movement lanes and peak hour turning movement volumes for each intersection. The lanes are also listed in Tables 1A and 1B, *Summary of Intersection Delay for the Unsignalized Intersection of North Shore and Stanfield Cutoff*, and *Summary of*

Intersection Delay and Level of Service (LOS) (Assumes North Shore and Stanfield Cutoff are Signalized), respectively, of the *Traffic Analysis* report.

Table 5.5-1
Determining Annual Growth Rates and Peak Month Factors

Road Location (See Figure 3 for Location References)	Year 1991			Year 2001			Growth Ratio	
	Annual Daily Traffic Volume	Peak Month Daily Traffic Volume	Peak Month Divided by Annual Daily Traffic Volume	Annual Daily Traffic Volume	Peak Month Daily Traffic Volume	Peak Month Divided by Annual Daily Traffic Volume	2001 Annual Volume Divided by 1991 Annual Volume	Annual Growth Rate (Percent)
1. Rim of the World Highway (SR-18) west of North Shore Drive (SR-38)	5,200	6,000	1.15	6,100	7,100	1.16	1.173	1.73%
2. Big Bear Boulevard (SR-18) east of North Shore Drive (SR-38)	6,900	8,000	1.16	6,300	7,300	1.16	0.913	-0.87%
3. Big Bear Boulevard (SR-18) west of Stanfield Cutoff	16,000	19,100	1.19	18,000	20,500	1.14	1.125	1.25%
4. Big Bear Boulevard (SR-18) east of Stanfield Cutoff	13,000	15,300	1.18	16,000	18,100	1.13	1.231	2.31%
5. North Shore Drive (SR-38) north of Big Bear Boulevard (SR-18) and Dam	2,000	2,350	1.18	1,600	2,300	1.44	0.800	-2.00%
6. North Shore Drive (SR-38) west of Stanfield Cutoff (SR-18)	3,000	3,450	1.15	3,400	4,750	1.40	1.133	1.33%
7. North Shore Drive (SR-38) east of Stanfield Cutoff	3,300	3,750	1.14	5,000	6,900	1.38	1.515	5.15%
Average			1.16			1.26		
Value Which Will Be Used for Traffic Study			1.25			1.25		

Note: SR = State Route

The peak month conditions are for a typical day in a peak month and do not necessarily include peak weekend conditions such as the Fourth of July.

EXISTING INTERSECTION DELAY

The technique used to assess the operation of an intersection is known as the Intersection Delay Method. To calculate the Intersection Delay value the volume of traffic using the intersection is compared with the capacity of the intersection. The Intersection Delay value is usually expressed as the average seconds of delay per vehicle using the intersection.

The Intersection Delay for the existing traffic conditions have been calculated and are shown in Table 5.5-2, *Summary of Intersection Delay and Level of Service for Unsignalized Intersection of North Shore and Stanfield Cutoff* and Table 5.5-3, *Summary of Intersection Delay and Level of Service (LOS) for Signalized Intersection of Big Bear Boulevard and Stanfield Cutoff*. Existing Intersection Delay values are based upon manual peak hour turning movement counts, factored up to represent peak month counts.

Table 5.5-2
Summary of Intersection Delay and Level of Service for the Unsignalized Intersection of Stanfield Cutoff and North Shore

Intersection	Land Use Scenario	Peak Hour	Lanes	Intersection Control	Two Way Stop Worst Level of Service (LOS)	
					Movement(s)	Level of Service
1. Stanfield Cutoff and North Shore – Average Month	Year 2001 Without Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2001 Without Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2001 With Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2001 With Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Peak Month	Year 2001 Without Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Peak Month	Year 2001 Without Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Peak Month	Year 2001 With Project	AM	Existing	2 Way Stop	NL, SL	B
1. Stanfield Cutoff and North Shore – Peak Month	Year 2001 With Project	PM	Existing	2 Way Stop	NL, SL	B
1. Stanfield Cutoff and North Shore – Average Month	Year 2006 Without Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2006 Without Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2006 With Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2006 With Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Peak Month	Year 2006 Without Project	AM	Existing	2 Way Stop	SL	B
1. Stanfield Cutoff and North Shore – Peak Month	Year 2006 Without Project	PM	Existing	2 Way Stop	SL	B
1. Stanfield Cutoff and North Shore – Peak Month	Year 2006 With Project	AM	Existing	2 Way Stop	NL, SL	B
1. Stanfield Cutoff and North Shore – Peak Month	Year 2006 With Project	PM	Existing	2 Way Stop	SL	B

Movement: NT = Northbound Through, NR = Northbound Right, NL = Northbound Left
ST = Southbound Through, SR = Southbound Right, SL = Southbound Left
ET = Eastbound Through, ER = Eastbound Right, EL = Eastbound Left
WT = Westbound Through, WR = Westbound Right, WL = Westbound Left

Table 5.5-3
Summary of Signalized Intersection Delay and Level of Service (LOS)

Intersection	Land Use Scenario	Peak Hour	Lanes												Delay in Seconds and Level of Service (LOS)	Inter-section Capacity Utiliza-tion (ICU) and LOS	Lanes
			Northbound			Southbound			Eastbound			Westbound					
			Thr	Rt	Lt	Thr	Rt	Lt	Thr	Rt	Lt	Thr	Rt	Lt			
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	35.2 D+	0.813 D+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	38.6 D+	0.913 E+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	36.5 D+	0.822 D+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	39.9 D+	0.918 E+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	28.3 C	0.643 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	26.8 C	0.669 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	29.2 C	0.654 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	27.5 C	0.675 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	49.3 D-	0.942 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	64.3 E	1.067 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	51.7 D-	0.951 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	66.1 E	1.072 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	31.7 C-	0.729 C+	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	30.2 C-	0.762 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	32.7 C-	0.741 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	31.0 C-	0.768 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	37.0 D+	0.839 D	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	42.0 D	0.943 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	38.4 D+	0.847 D	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	43.4 D	0.949 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	28.8 C	0.660 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	27.3 C	0.687 B-	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	29.9 C	0.671 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	28.1 C	0.693 B-	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	55.3 E+	0.975 E-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	73.6 E-	1.104 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	57.8 E+	0.987 E-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	75.5 E-	1.110 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	32.7 C-	0.752 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	31.1 C-	0784 C-	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	33.8 C-	0766 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	31.9 C-	0.790 C-	Widen

Table continue on next page

NOTES
The Level of Service (LOS) for the Delay Method and Intersection Capacity Utilization Method differ because they are calculated entirely differently and LOS is defined differently. See Appendices for further discussion.

Table 5.5-3 - Continued
Summary of Signalized Intersection Delay and Level of Service (LOS)

Intersection	Land Use Scenario	Peak Hour	Lanes												Delay in Seconds and Level of Service (LOS)	Inter-section Capacity Utiliza-tion (ICU) and LOS	Lanes
			Northbound			Southbound			Eastbound			Westbound					
			Thr	Rt	Lt	Thr	Rt	Lt	Thr	Rt	L	Thr	Rt	L			
1. Stanfield Cutoff (NS) and North Shore	2025 Average Month Without Project	AM	1	1	0	1	1	0	1	1	0	1	0	0	12.0 B+	0.456 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Average Month Without Project	PM	1	1	0	1	1	0	1	1	0	1	0	0	17.8 B-	0.359 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Average Month With Project	AM	1	1	0	1	1	0	1	1	0	1	0	0	12.2 B+	0.456 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Average Month With Project	PM	1	1	0	1	1	0	1	1	0	1	0	0	19.3 B-	0.359 A+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	48.4 D-	0.937 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	62.5 E+	1.060 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	50.8 D-	0.946 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	64.3 E	1.065 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	31.5 C-	0.726 C+	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	30.0 C	0.757 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	32.6 C-	0.737 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	30.7 C-	0.763 C	Widen
1. Stanfield Cutoff (NS) and North Shore	2025 Peak Month Without Project	AM	1	1	0	1	1	0	1	1	0	1	0	0	12.0 B+	0.456 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Peak Month Without Project	PM	1	1	0	1	1	0	1	1	0	1	0	0	17.8 B-	0.359 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Peak Month With Project	AM	1	1	0	1	1	0	1	1	0	1	0	0	12.2 B+	0.456 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Peak Month With Project	PM	1	1	0	1	1	0	1	1	0	1	0	0	19.3 B-	0.359 A+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	86.9 F+	1.110 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	119.0 F-	1.250 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	90.4 F	1.122 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	121.1 F-	1.255 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	37.9 D+	0.846 D	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	36.1 D+	0.872 D	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	39.4 D+	0.860 D	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	37.1 D+	0.877 D-	Widen

NOTES
The Level of Service (LOS) for the Delay Method and Intersection Capacity Utilization Method differ because they are calculated entirely differently and LOS is defined differently. See Appendices for further discussion.

Appendix B of the *Traffic Analysis* report contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

PARKING

The portion of State Route 38 that traverses the project site contains a shoulder of varying widths, which allows for temporary and emergency parking.

BIKE ROUTES

The portion of State Route 38 that traverses the project site does not include any County designated bike routes.

TRANSIT

The portion of State Route 38 that traverses the project site does not include any public transit facilities (i.e., bus turnouts).

EXISTING LEVEL OF SERVICE

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 5.5-4, *Level of Service Description For Delay Method (1997 Methodology)*, shows how LOS is related to Intersection Delay, and describes LOS. Existing intersections in the vicinity of the site currently operate a LOS D capacity or better based on delay. However, the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization (ICU) greater than 100 percent in the peak month weekday evening peak hour.

Table 5.5-4
Level of Service Description for Delay Method (1997 Methodology)

Level of Service	Description	Stopped Delay Per Vehicle (Seconds)
A	Level of Service A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 10.0
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	10.1 to 20.0
C	Level of Service generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.1 to 35.0
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.1 to 55.0
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.1 to 80.0
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.1 +
Source:	Highway Capacity Manual, Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 1997, pages 9-6 to 9-7.	

IMPACTS

SIGNIFICANCE CRITERIA

The traffic issues related to the proposed land use and development have been evaluated in the context of the California Environmental Quality Act (CEQA) and the San Bernardino County Congestion Management Program (CMP). The County of San Bernardino is the lead agency responsible for preparation of the traffic impact analysis, in accordance with both CEQA and CMP authorizing legislation.

Environmental impact thresholds as indicated in Appendix G, *Initial Study Checklist*, of the CEQA Guidelines were also used as significance thresholds in this analysis. As such, the project would create a significant impact if it would cause one or more of the following to occur:

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections) (refer to Impact Statements 5.5-1, 5.5-2 and 5.5-3);

- Exceed, either individually or cumulatively, a LOS standard established by the County CMP agency for designated roads or highways (refer to Impact Statements 5.5-1, 5.5-2 and 5.5-3);

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks (refer to Section 10.0, *Effects Found Not To Be Significant*);

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) (refer to Impact Statement 5.5-4);

- Result in inadequate emergency access (refer to Impact Statement 5.5-4);

- Result in inadequate parking capacity (refer to Impact Statement 10.0, *Effects Found Not To Be Significant*); and/or

- Conflict with adopted policies, plans or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks) (refer to Section 10.0, *Effects Found Not To Be Significant*).

CONGESTION MANAGEMENT PROGRAM (CMP) METHODOLOGY

California legislation requires that a Traffic Impact Analysis (TIA) be prepared for new development. The TIA is prepared to monitor and fix traffic problems anticipated by new development.

The general approach for conducting a TIA is to count existing weekday peak hour traffic and determine the percent of roadway capacity currently used. The percentage growth in traffic is accounted for and added to existing traffic and the percent of roadway capacity used is again determined. Then, the project traffic is added and the percent of roadway capacity used is again determined. If the new project adds traffic to an overcrowded facility, then the new project has to mitigate the traffic impact so that the facility operates at a level which is no worse than before the project traffic was added.

In San Bernardino County, a project requires a TIA if it generates more than 250 new peak hour trips. The Moon Camp project would generate 93 new peak hour trips (approximately). Although this project does not generate 250 new peak hour trips, the County of San Bernardino has requested that the SANBAG TIA requirements be met, with one exception. That exception is that engineering judgment can be used for determining the project's peak hour traffic distribution rather than determining the traffic distribution using the East Valley Traffic Model.

PRESCRIBED METHODOLOGY FOR A TRAFFIC IMPACT ANALYSIS (TIA)

A TIA must include all monitored intersections to which the project adds traffic above a certain minimum amount. In San Bernardino County, the monitored intersections are all arterial-to-arterial intersections. The CMP requires that all arterial links and their CMP intersections be included in the analysis when the anticipated project volume equals or exceeds 80 two-way trips in one peak hour. For freeways, it is 100 two-way trips in the peak hour. Based on this requirement and the distribution of project-generated trips, the project-generated arterial link volumes are less than 80 trips on all roadway links and their intersections. Thus, the intersections of Stanfield Cutoff and North Shore Drive, and Stanfield Cutoff and Big Bear Boulevard are not CMP intersections.

If a project adds more traffic than the minimum threshold amount to an intersection, then that intersection has to be analyzed for deficiencies. If the intersection has to be analyzed for deficiencies, then mitigation is required if the existing traffic plus anticipated traffic growth plus project traffic causes the Intersection Delay to go above a certain point.

In San Bernardino County, mitigation is required if the intersection operates at worse than Level of Service C (i.e., Level of Service D), which corresponds to a maximum acceptable delay of 35 seconds for signalized intersections. The TIA guidelines require Level of Service E.

In San Bernardino County, impacted intersections are analyzed using the Delay Methodology and the ICU Methodology. Although the Delay Method is required per TIA guidelines, the ICU Method is also used per TIA requirements to assure that there are no operational problems. An intersection mitigation measure shall either fix the deficiency, or reduce both the delay and ICU so that they are below the level which occurs without the project.

Project traffic is generated using rates and procedures contained in the Institute of Transportation Engineers, *Trip Generation* manual. Project traffic distribution is provided by the reviewing agency or is agreed to in advance of the TIA being prepared. The TIA has to be prepared by a licensed Traffic Engineer.

The traffic analysis has been prepared in accordance with the TIA requirements except as noted. The TIA not only examined the CMP system of roads and intersections, but also other roads and intersections. The project generated traffic was added to intersections, and a full intersection analysis was conducted, even when the project added traffic failed to meet the minimum thresholds that require an intersection analysis.

The *Traffic Analysis* report prepared by Kunzman Associates includes the following: project generated traffic added to intersections and a full intersection analysis, even when the project added traffic failed to meet the minimum thresholds that require an intersection analysis. As stated in the Traffic Analysis report, the County of San Bernardino has requested that the following intersections be analyzed:

- Stanfield Cutoff and North Shore Drive
- Stanfield Cutoff and Big Bear Boulevard

Impacts to traffic and circulation are analyzed below according to topic. Mitigation measures at the end of this Section directly correspond with the identified impact.

Summary of Findings

- For existing traffic conditions, the intersection of Stanfield Cutoff and North Shore Drive operates at Level of Service A capacity based on delay. The intersection of Stanfield Cutoff and Big Bear Boulevard operates at Level of Service E based on Delay, which is unacceptable. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection. This may involve widening of the intersection and may involve the taking of right of way.

- For existing plus project traffic conditions, the intersection of Stanfield Cutoff and North Shore Drive operates at Level of Service B capacity based on delay. The intersection of Stanfield Cutoff and Big Bear Boulevard with the recommended mitigation measure operates at Level of Service D based on Delay, which is acceptable for a State Highway. Although based on established threshold of significance criteria, the project has an insignificant traffic impact on Stanfield Cutoff and Big Bear Boulevard, it nevertheless contributes to the utilization deficiency at the weekday evening peak hour.

- After project completion and in the year 2006, the intersection of Stanfield Cutoff and North Shore Drive operates at Level of Service B capacity based on delay. The intersection of Stanfield Cutoff and Big Bear Boulevard with the recommended mitigation measure operates at Level of Service D based on Delay, which is acceptable for a State Highway.

- Although the project does not have a significant impact on the intersection of Stanfield Cutoff and North Shore Drive, this intersection will require a traffic signal by 2025 because of background traffic growth.

- Project-related traffic would not warrant the installation of a traffic signal at any location.

EXISTING CONDITIONS WITH PROJECT TRAFFIC ANALYSIS

5.5-1 *The intersection of Stanfield Cutoff and Big Bear Boulevard currently operates above 100 percent utilization in the peak month weekday evening peak hour. Although the Project does not generate significant traffic volumes, it would contribute to the intersection utilization at the weekday evening peak hour. Pro-rata share payment for intersection improvements to the intersection would reduce project affects to less than significant levels.*

PROJECT TRAFFIC

To estimate project-related traffic volumes at various points on the street network, a three-step process is utilized. First, the traffic that would be generated by the proposed development is determined. Second, the traffic volumes are geographically distributed to major attractions of trips, such as employment centers, commercial centers, recreational areas or residential areas. Finally, the trips are assigned to specific roadways and the project-related traffic volumes are determined on a route-by-route basis.

Traffic Generation

The traffic generated by the project is determined by multiplying an appropriate trip generation rate by the quantity of land use. Trip generation rates are expressed in terms of trip ends per person, trip ends per employee, trip ends per acre, trip ends per dwelling, or trip ends per thousand square feet of floor space. For instance, if a particular land use generates six outbound trips per acre in the morning peak hour, then six vehicles are expected to leave the site in the morning peak hour for each acre of development.

Significant research efforts have been made by the Institute of Transportation Engineers and others to establish the correlation between trips and land use. From this body of information, trip generation rates have been estimated by Kunzman Associates with reasonable accuracy for various land uses.

Trip generation rates are predicated on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and our life styles remain similar to what we know today. A major change in these variables may affect trip generation rates.

Trip generation rates were determined for daily traffic, morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the

proposed land uses. The trip generation rates are from Trip Generation, Sixth Edition, Institute of Transportation Engineers, 1997.

By multiplying the traffic generation rates by the land use quantities, traffic volumes are determined. Table 5.5-5, *Project Traffic Generation*, shows the traffic generation rates and the peak hour and daily traffic volumes.

Table 5.5-5
Project Traffic Generation

Descriptor	Trip Generation Rate	Trips Generated by 92 Dwellings
Units	Dwellings	Dwellings
Daily	9.57	880
Morning Peak Hour - In	0.19	17
Morning Peak Hour - Out	0.56	52
Total	0.75	69
Evening Peak Hour - In	0.65	60
Evening Peak Hour - Out	0.36	33
Total	1.01	93
Source: Trip Generation, 6th Edition, Institute of Transportation Engineers, 1997, Category 210.		

The project also includes 100 boat slips. The boat slips are to be used by residents who live there, and are not expected to generate additional external traffic.

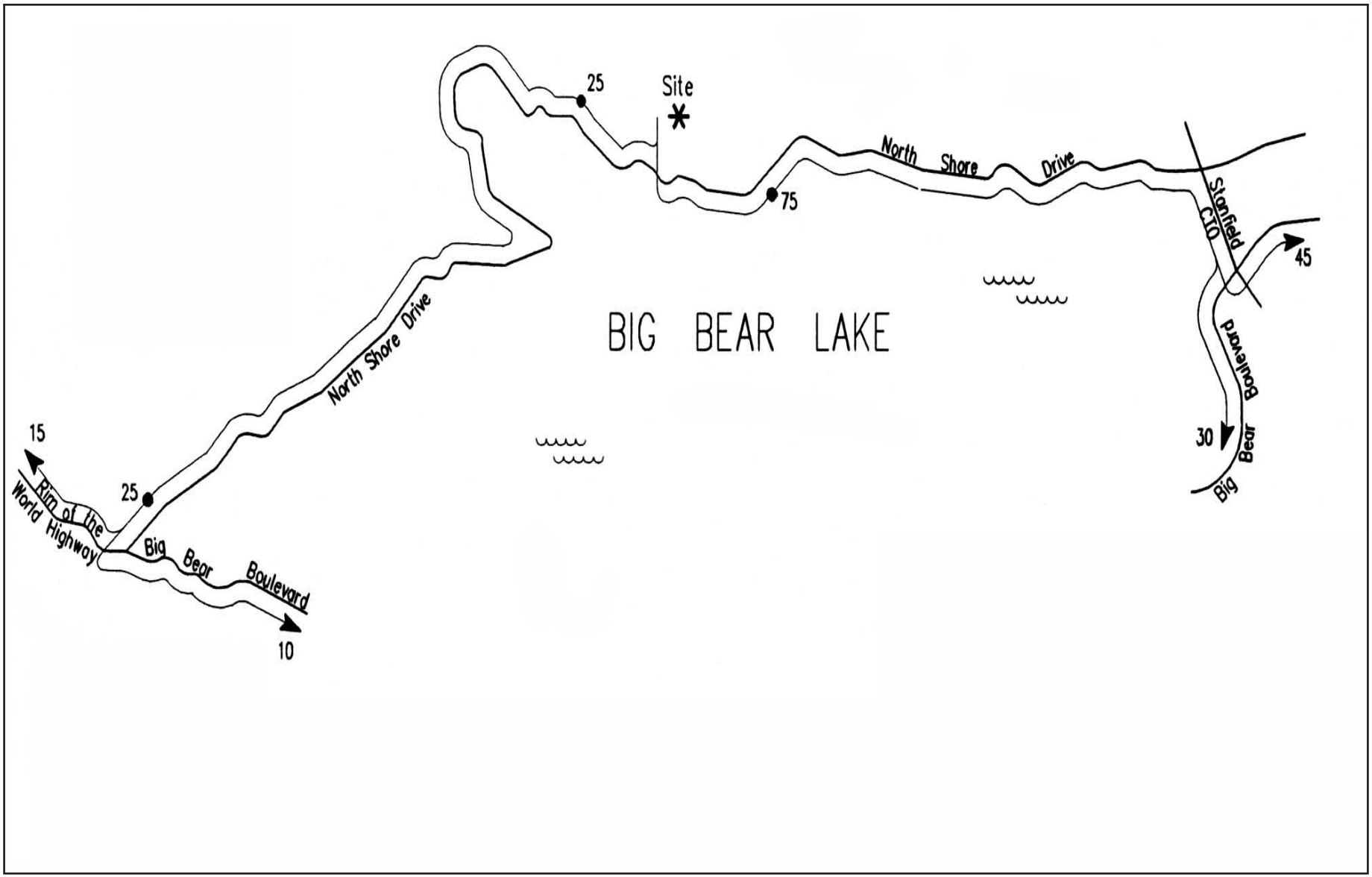
For the purposes of the traffic analysis, it is assumed that the homes are lived in year round by persons who commute to work. This is a maximum, or worst case, scenario. It is likely that some homes would be second homes and that those who do live there would tend to be retired, more than typically found in Southern California.

Traffic Distribution and Assignment

Traffic distribution is the determination of the directional orientation of traffic. It is based on the geographical location of employment centers, commercial centers, recreational areas, or residential area concentrations.

Traffic assignment is the determination of which specific route development traffic would use, once the generalized traffic distribution is determined. The basic factors affecting route selection are minimum time path and minimum distance path.

Exhibit 5.5-5, *Project Traffic Distribution (Weekday Peak Hours)*, contains the directional distribution and assignment of the project traffic for the proposed land uses. As shown on Exhibit 5.5-5, the majority of project traffic distribution (75%) would occur to the east of the project site, along State Route 38. All of the trips



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-5

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Project Traffic Distribution (Weekday Peak Hours)

generated on State Route 38, east of the project site, are distributed to Stanfield Cutoff, then to Big Bear Boulevard. Big Bear Boulevard, east of Stanfield Cutoff, would receive 45 percent of the project-generated traffic, while Big Bear Boulevard, west of Stanfield Cutoff, would receive 30 percent of the project-generated traffic. State Route 38, west of the project site, would receive 25 percent of the project-generated traffic. Traffic from State Route 38, west of the project site would distribute on to Rim of the World Highway (15 percent) and Big Bear Boulevard (10 percent).

Project-Related Traffic

Based on the identified traffic generation and distributions, project related daily traffic volumes are shown in Exhibit 5.5-6, *Project Generated Daily Traffic Volumes*. As shown on Exhibit 5.5-6, the majority of project-generated traffic (660 trips) would be distributed to the east of the project site, along State Route 38. All of the trips generated on State Route 38, east of the project site, are distributed to Stanfield Cutoff, then to Big Bear Boulevard. Big Bear Boulevard, east of the project site, would receive 396 trips from Stanfield Cutoff, while Big Bear Boulevard, west of Stanfield Cutoff, would receive 264 trips from Stanfield Cutoff. State Route 38, west of the project site, would receive 220 project-generated trips. Trips from State Route 38, west of the project site would be distributed to Rim of the World Highway (132 trips) and Big Bear Boulevard (88 trips).

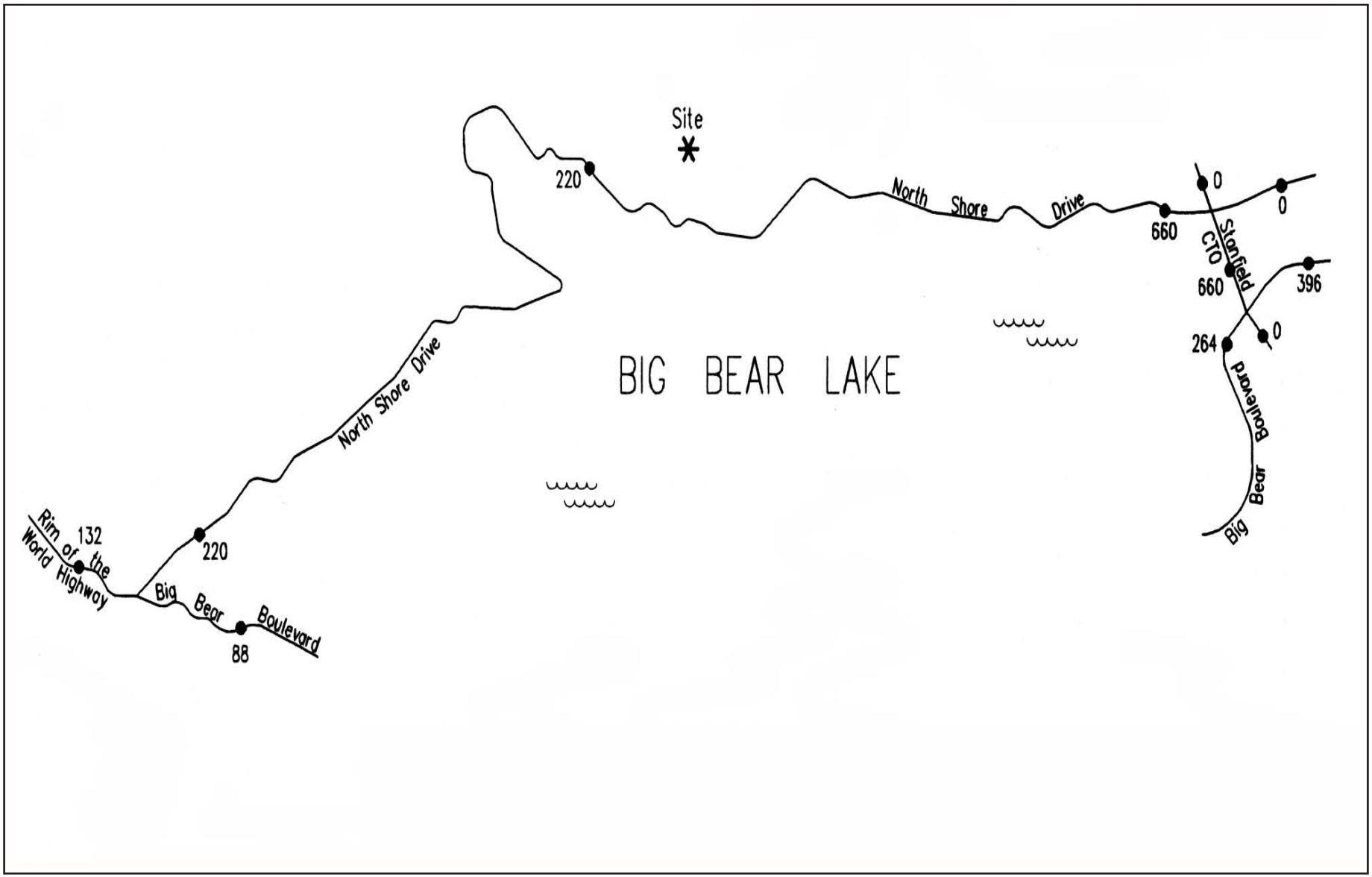
EXISTING PLUS PROJECT TRAFFIC CONDITIONS

Once the project-related traffic is assigned to the existing street network and added to existing volumes, the traffic impact can be assessed. Exhibit 5.5-7, *Existing Plus Project Daily Traffic Volumes – Peak Month*, illustrates the existing plus project traffic conditions for the peak month. As shown on Exhibit 5.5-7, the traffic volume on State Route 38, east of the project site and west of Stanfield Cutoff, is 5,417. The traffic volume on Stanfield Cutoff is 6,292, which includes traffic distributed from State Route 38 and Big Bear Boulevard. The highest traffic volumes occur on Big Bear Boulevard, with volumes of 20,767 west of Stanfield Cutoff, and volumes of 18,500 east of Stanfield Cutoff. Traffic volumes along State Route 38 (east of Stanfield Cutoff) and Stanfield Cutoff (north of State Route 38 and south of Big Bear Boulevard) would not be impacted by project generated traffic (refer to Exhibit 5.5-6).

The *Traffic Analysis* report prepared by Kunzman Associates contains plots of the existing plus project peak hour intersection turning movement volumes and number of intersection through and turning movement lanes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Traffic Signal Warrants

Traffic signal warrants have been adopted by the Federal Highway Administration and Caltrans. These warrants are based upon the eight highest hour volumes in a day. It is assumed by Caltrans that the eighth highest hour is 62.5 percent of the



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-6

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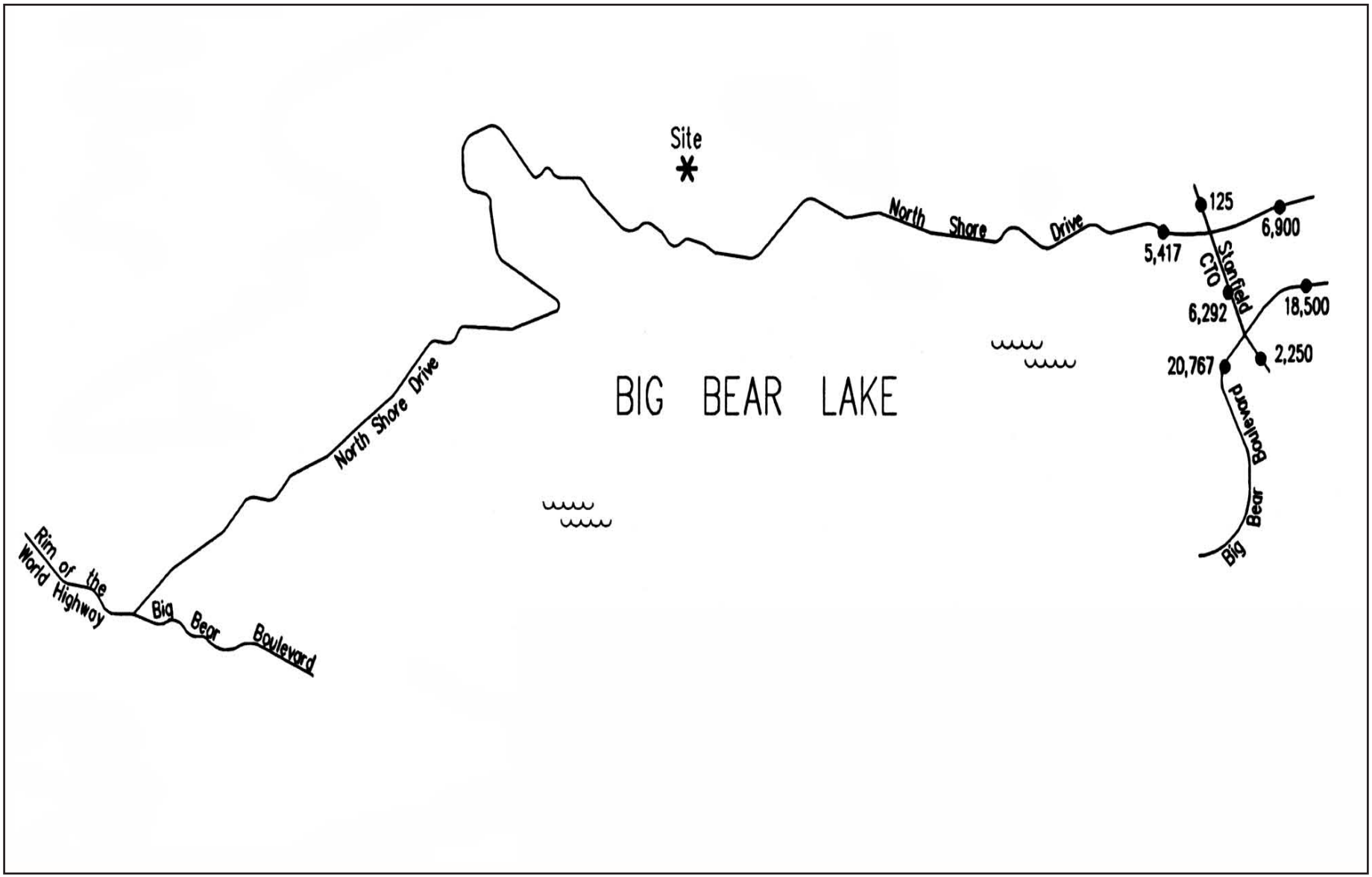
Project Generated Daily Traffic Volumes



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-7

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Existing Plus Project Daily Traffic Volumes - Peak Month

peak hour, and the peak hour is generally 10 percent of the daily traffic. Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5.5-6, *Traffic Signal Warrants (Based on Estimated Average Daily Traffic)*, shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5.5-6. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

A traffic signal would not be warranted at the intersection of Stanfield Cutoff and North Shore Drive based on rural warrants. Rural warrants are applicable for rural areas and urban roadways with speeds over 40 miles per hour.

Existing Plus Project Intersection Delay and Level of Service

The Intersection Delay for the existing plus project traffic conditions have been calculated and are shown in Table 5.5-3. The Kunzman traffic report contains the Intersection Delay calculations. From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. Table 5.5-4 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 5.5-2 and 5.5-3, it can be seen that all intersections in the vicinity of the site operate at a LOS D or better for existing plus project peak hour traffic conditions, based on Delay. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection. Although the project itself does not have a significant impact on this intersection it does contribute to an existing deficiency at the intersection. Pro-rata share payment for improvements to the intersection would reduce project affects to less than significant. It therefore is not required to mitigate this deficiency.

The Kunzman Associates traffic study references the need for the eastbound right turn lane to be converted to a through lane, which may require widening and an additional take of right of way. The widening and additional right of way may be needed before or after the intersection, or both. Whether widening and a take of right of way is required depends on lane widths and taper lengths required by Caltrans.

Table 5.5-6
Traffic Signal Warrants
(Based on Estimated Average Daily Traffic)

Signal Warrant	Minimum Requirements Estimated Average Daily Traffic (EADT)	
Urban . . . . . Rural . . . . . Use Rural if critical speed equals or exceed 40 MPH		
1. Minimum Vehicular Satisfied _____ Not Satisfied _____	Vehicles per day on major street (total of both approaches)	Vehicles per day on higher-volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach		
Major Street / Minor Street	Urban / Rural	Urban / Rural
1 . . . . . 1	8,000 / 5,600 < < <	2,400 / 1,680 < < <
2 or more . . . . . 2 or more	9,600 / 6,720	2,400 / 1,680
2 or more . . . . . 2 or more	9,600 / 6,720	3,200 / 2,240
1 . . . . . 1	8,000 / 5,600	3,200 / 2,240
2. Interruption of Continuous Traffic Satisfied _____ Not Satisfied _____	Vehicles per day on major street (total of both approaches)	Vehicles per day on higher-volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach		
Major Street / Minor Street	Urban / Rural	Urban / Rural
1 . . . . . 1	12,000 / 8,400 < < <	1,200 / 850 < < <
2 or more . . . . . 2 or more	14,400 / 10,080	1,200 / 850
2 or more . . . . . 2 or more	14,400 / 10,080	1,600 / 1,120
1 . . . . . 1	12,000 / 8,400	1,600 / 1,120
3. Combination Satisfied _____ Not Satisfied _____ No one warrant satisfied but following warrants fulfilled 80% or more . . . . . _____ (1) _____ (2)	2 Warrants	2 Warrants

NOTES:

1. Heavier left turn movement from the major street may be included with minor street volume if a separate signal phase is to be provided for the left-turn movement.
2. To be used only for new intersections or other locations where actual traffic volumes cannot be counted.

<<<< These are the warrant volumes that apply to Stanfield Cutoff and North Shore Drive.

Source: Caltrans, Traffic Manual, page 9-8.

The available right-of-way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino.

YEAR 2006 TRAFFIC ANALYSIS

5.5-2 *Project implementation, with year 2006 traffic conditions, would result in an increase in traffic volumes. Analysis has concluded that implementation of recommended mitigation measures would reduce impacts to the intersection of Stanfield Cutoff and Big Bear Boulevard to a less than significant level.*

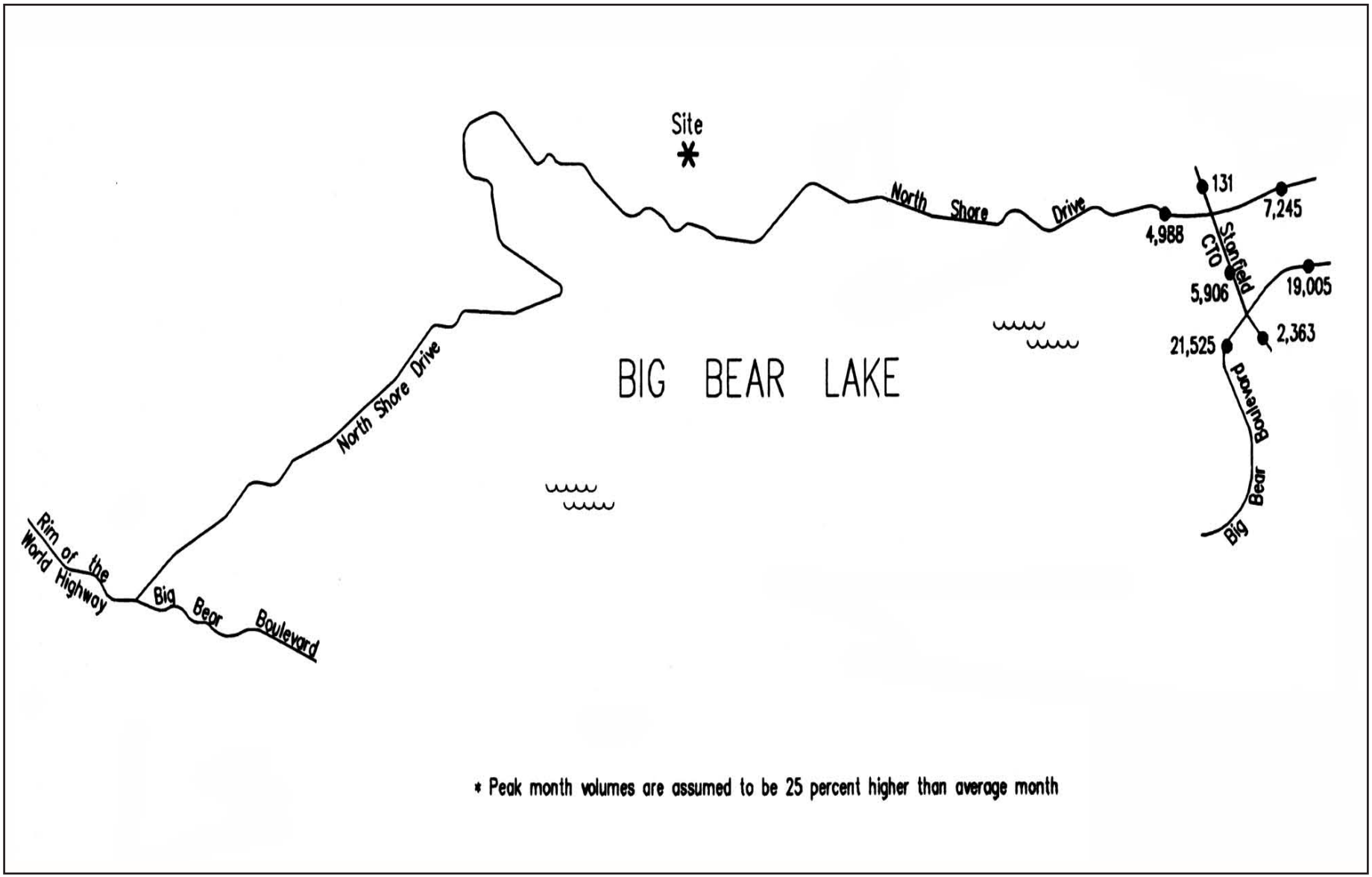
To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. The *Traffic Analysis* report contains analysis on the "existing plus other development traffic conditions" in 2006 (refer to Section 7 of the *Traffic Analysis* report). Exhibit 5.5-8, *Year 2006 Daily Traffic Volumes - Peak Month*, illustrates traffic conditions including other anticipated development with the project. Table 5.5-7, *Daily Leg Volume Calculations*, shows the calculations of intersection leg daily traffic volumes. To account for growth which can be expected in the area, a growth rate of 1 percent per year compounded annually for five years is assumed. The total compounded growth over 5 years is 5 percent. The basis of this growth rate assumption is the County of San Bernardino.

As shown on Exhibit 5.5-8, the daily traffic volumes on State Route 38, east of the project site and west of Stanfield Cutoff, is 4,988. The volumes on Stanfield Cutoff are 5,906, which include traffic distributed from State Route 38 and Big Bear Boulevard. The highest traffic volumes are on Big Bear Boulevard, with volumes of 21,525 west of Stanfield Cutoff and volumes east of Stanfield Cutoff of 19,005.

The Kunzman traffic report contains plots of the cumulative conditions peak hour intersection turning movement volumes and number of intersection through and turning movement lanes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Traffic Signal Warrants - Year 2006

Traffic signals would not be warranted at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. Refer to discussion under "Traffic Signal Warrants" under Impact Statement 5.5-1 for the applicability of Rural Warrants.



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-8

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Year 2006 Daily Traffic Volumes - Peak Month

Table 5.5-7
Daily LEG Volume Calculations

Intersection	Intersection Leg	Project Added Daily Leg Volume	Existing Year 2001		Year 2006		Year 2025	
			Existing Daily Volumes	With Project Volumes	Existing Plus Background Growth Daily Volumes	With Project Volumes	Existing Plus Background Growth Daily Volumes	With Project Volumes
1. Stanfield Cutoff (NS) and	North	0	100	100	105	105	124	124
North Shore Drive (EW)	South	667	4,500	5,167	4,725	5,392	5,580	6,247
	East	0	4,500	4,500	4,725	4,725	5,580	5,580
Average Month	West	667	2,100	2,767	2,205	2,872	2,604	3,271
2. Stanfield Cutoff (NS) and Big	North	667	4,500	5,167	4,725	5,392	5,580	6,247
Bear Boulevard (EW)	South	0	1,800	1,800	1,890	1,890	2,232	2,232
	East	400	13,800	14,200	14,490	14,890	17,112	17,512
Average Month	West	267	16,900	17,167	17,745	18,012	20,956	21,223
1. Stanfield Cutoff (NS) and	North	0	125	125	131	131	155	155
North Shore Drive (EW)	South	667	6,000	6,667	6,300	6,967	7,440	8,107
	East	0	6,000	6,000	6,300	6,300	7,440	7,440
Peak Month	West	667	2,700	3,367	2,835	3,502	3,348	4,015
2. Stanfield Cutoff (NS) and Big	North	667	6,000	6,667	6,300	6,967	7,440	8,107
Bear Boulevard (EW)	South	0	2,200	2,200	2,310	2,310	2,728	2,728
	East	400	17,300	17,700	18,165	18,565	21,452	21,852
Peak Month	West	267	21,100	21,367	22,155	22,422	26,164	26,431

NOTE: Background Growth Rate is assumed to be as follows in percent: 1.000

From Year 2001 to Year 2006 is 5 years. the calculated simple growth factor is : 1.050

From Year 2001 to Year 2025 is 24 years. The calculated simple growth factor is: 1.240

It should be noted that signals should be installed only when warranted and that installation of unwarranted signals can increase accident potential, energy consumption, and air pollutant emissions, while costing governmental jurisdictions approximately $500 per month for maintenance and utilities.

Existing Plus Other Development Level of Service – Year 2006

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 5.5-2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 5.5-1, it can be seen that all intersections in the vicinity of the site operate at a LOS E or better for existing plus other development peak hour traffic conditions based on delay. However, as previously noted, the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. As stated under the existing plus project impact analysis, the solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection.

Existing Plus Project Plus Other Development Traffic Conditions – Year 2006

Additional development is presently planned in the vicinity of the site. To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. Exhibit 5.9-9, *Year 2006 Plus Project Daily Traffic Volumes – Peak Month*, illustrates traffic conditions including other planned development with the project.

As shown on Exhibit 5.5-9, *Year 2006 Plus Project Daily Traffic Volumes*, on State Route 38, east of the project site and west of Stanfield Cutoff, is 5655. The volumes on Stanfield Cutoff are 6573 which include traffic distributed from State Route 38 and Big Bear Boulevard. The highest traffic volumes are on Big Bear Boulevard with volumes of 21,792 west of Stanfield Cutoff and volumes east of Stanfield Cutoff of west of Stanfield Cutoff and volumes east of Stanfield Cutoff of 19,405.

Cumulative Conditions Level of Service – Year 2006

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 5.5-4 shows how LOS is related to Intersection Delay, and describes LOS.

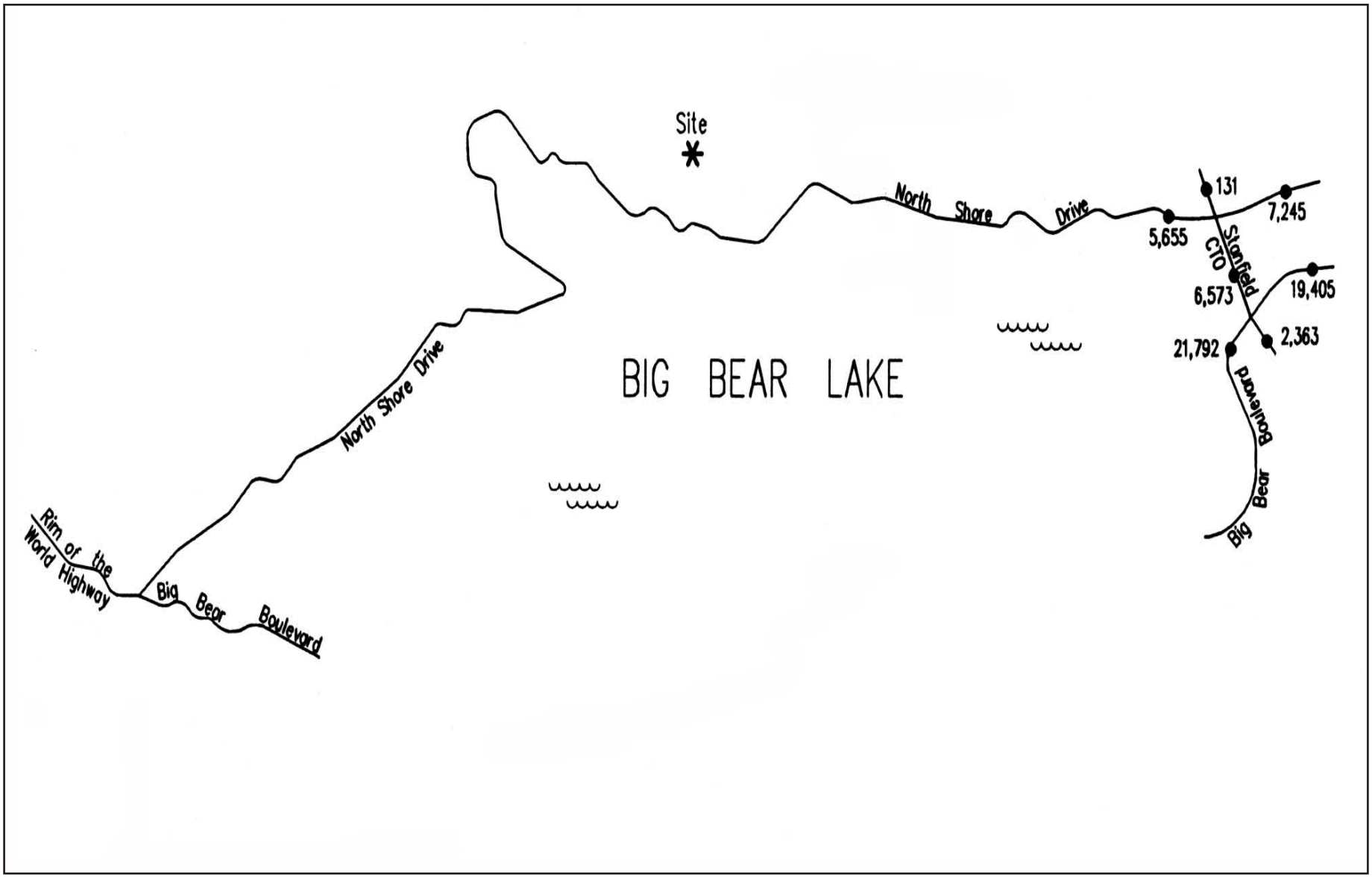
From Table 5.5-1, it can be seen that all intersections in the vicinity of the site operate at LOS F or better for cumulative peak hour traffic conditions based on delay. However, as noted, the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection.

YEAR 2025 TRAFFIC ANALYSIS

5.5-3 *Project implementation, with year 2025 traffic conditions, would result in an increase in traffic volumes. Analysis has concluded that implementation of recommended mitigation measures would reduce impacts to the intersection of Stanfield Cutoff/Big Bear Boulevard and Stanfield Cutoff/North Shore Drive to a less than significant level.*

To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. Exhibit 5.5-10, *Year 2025 Plus Project Daily Traffic Volumes - Peak Month*, illustrates traffic conditions including other anticipated development with the project. Table 5.5-8 shows the calculations of intersection leg daily traffic volumes. To account for growth which can be expected in the area, a growth rate of one percent per year compounded annually for 24 years has been assumed. The total compounded growth over 24 years is 24 percent. The basis of this growth rate assumption can be found in Table 5.5-1. To note, the *Traffic Analysis* report contains analysis on the "existing plus other development traffic conditions" in 2025 (refer to Section 9 of the *Traffic Analysis* report).

As shown on Exhibit 5.5-10, the traffic volume on State Route 38, east of the project site and west of Stanfield Cutoff, is 5,890. The traffic volume on Stanfield Cutoff is 6,975, which includes traffic distributed from State Route 38 and Big Bear Boulevard.



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-9

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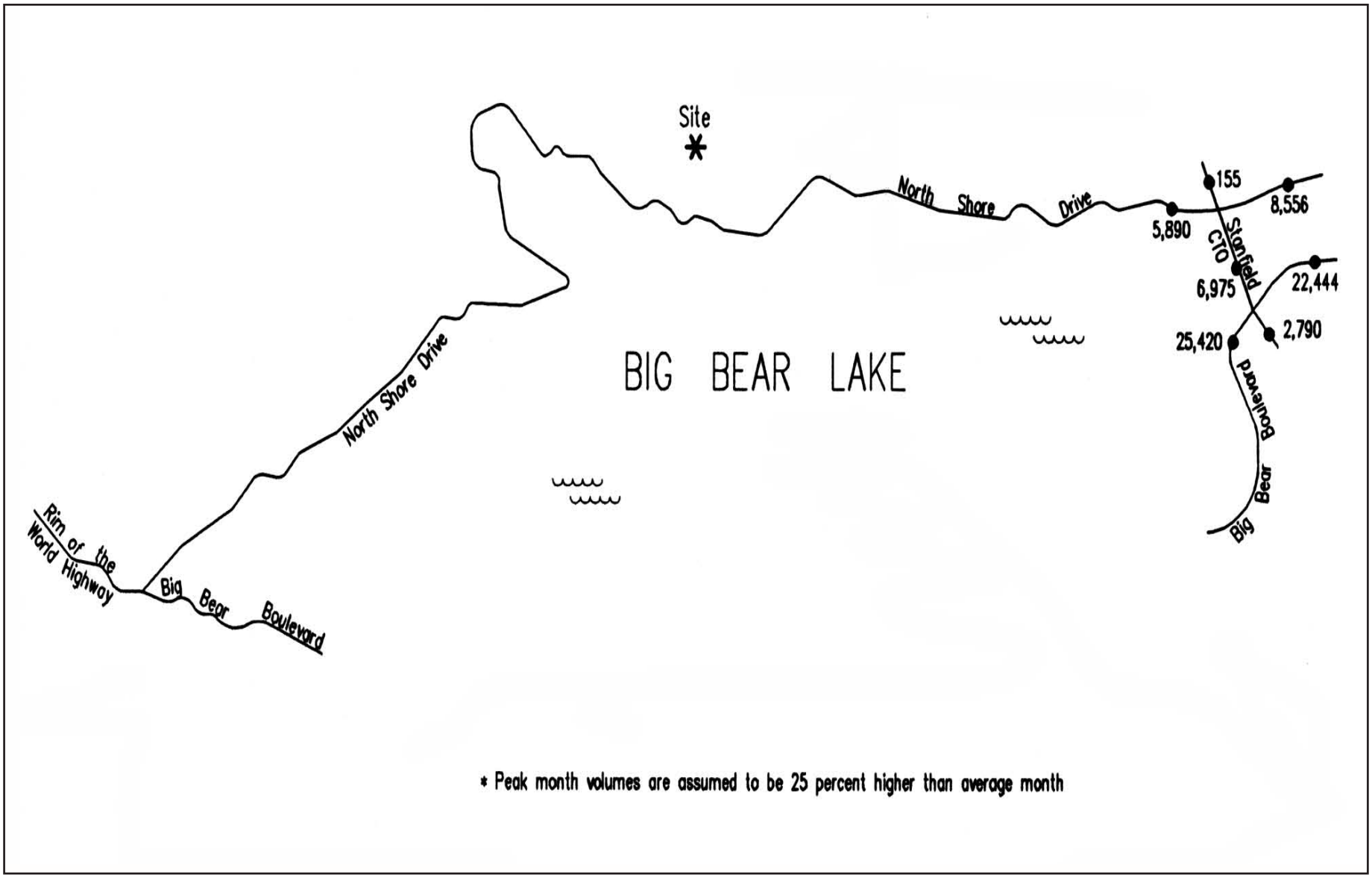
Year 2006 Plus Project Daily Traffic Volumes - Peak Month



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-10

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Year 2025 Daily Traffic Volumes - Peak Month

The highest traffic volumes are contained on Big Bear Boulevard, with a traffic volume of 25,420 west of Stanfield Cutoff, and a traffic volume of 22,444 east of Stanfield Cutoff.

The Kunzman traffic report contains plots of the cumulative conditions peak hour intersection turning movement volumes and number of intersection through and turning movement lanes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Traffic Signal Warrants - Year 2025

Traffic signals would be required at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. The applicability of Rural Warrants was previously discussed. Refer to discussion under "Traffic Signal Warrants" under Impact Statement 5.5-2 for the applicability of Urban Warrants.

Cumulative Conditions Intersection Delay and Level of Service - Year 2025

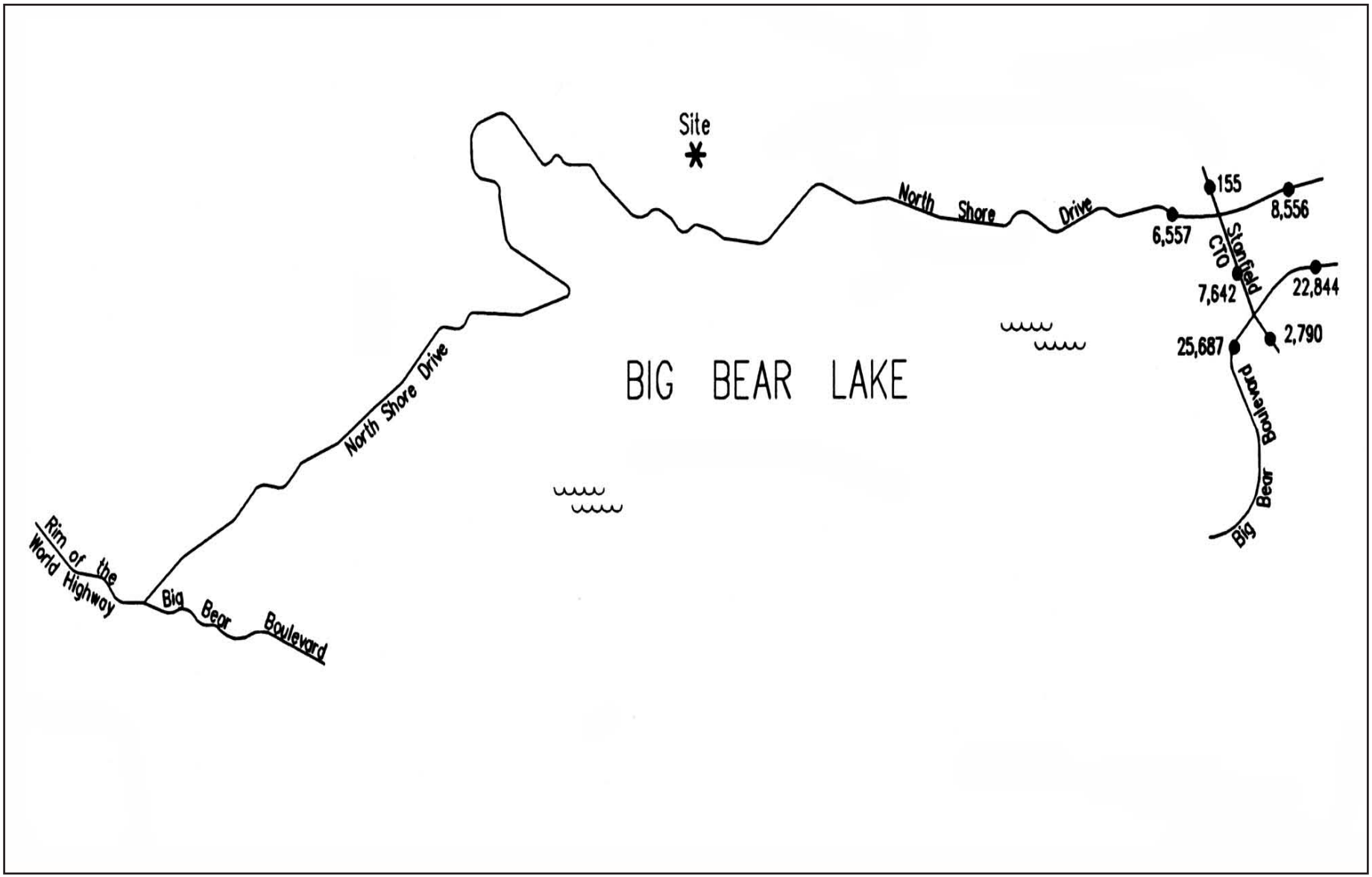
Table 5.5-3 shows the Intersection Delay for cumulative traffic conditions in 2025. Appendix B of the *Traffic Analysis* report contains the Intersection Delay calculations. From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. Table 5.5-4 shows how LOS is related to Intersection Delay, and describes LOS. As shown in Table 5.5-3, the analysis for Year 2025 "Peak Month With Project" traffic conditions evaluates the intersection of Stanfield Cutoff/Big Bear Boulevard under four different scenarios. The four scenarios are as follows:

- AM Peak Hour - Existing Lane Configuration
- PM Peak Hour – Restriped Lane Configuration
- AM Peak Hour – Existing Lane Configuration
- PM Peak Hour – Restriped Lane Configuration

As shown in Table 5.5-2 and 5.5-3, the intersection of Stanfield Cutoff/Big Bear Boulevard would operate at a LOS E or better for existing plus other development peak hour traffic conditions based on delay. However, as previously noted, the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection.

Existing Plus Project Plus Other Development Traffic Conditions – Year 2005

Additional development is presently planned in the vicinity of the site. To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. Exhibit 5.5-11, *Year 2025 Plus Project Daily Traffic Volumes – Peak Month*, illustrates traffic conditions including other planned development with the project.



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-11

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MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Year 2025 Plus Project Daily Traffic Volumes - Peak Month

As shown on Exhibit 5.5-11, Year 2025 Plus Project Daily Traffic Volumes on State Route 38, east of the Project site and west of Stanfield Cutoff is 6,557. The volumes on Stanfield Cutoff are 7,642 which include traffic distributed from State Route 38 and Big Bear Boulevard with volumes of 25,687 west of Stanfield Cutoff and volumes east of Stanfield Cutoff of 22,844.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Cumulative Conditions Levels of Service – 2025

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 5.5-4 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 5.5-3, it can be seen that the intersection of Stanfield Cutoff and Big Bear Boulevard operates at LOS F, with or without the project, without mitigation measures, whether using the Delay method or the ICU method. To accommodate year 2006 traffic, it is recommended that the eastbound right turn lane be converted to an eastbound through lane through the intersection. This mitigation measure also solves the 2025 traffic conditions.

The project does not have a significant impact on this intersection based on the thresholds of significance described. It therefore is not required to help mitigate this deficiency.

Traffic Signal Warrants – Year 2025

Traffic signals will be warranted with or without the project at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. The applicability of Rural Warrants was previously discussed.

Pro Rata Share of Off-Site Improvement Costs

Although the project does not significantly impact the intersection of Stanfield Cutoff and North Shore Drive, nor the intersection of Stanfield Cutoff and Big Bear Boulevard per the thresholds discussed, the County of San Bernardino has requested that a pro-rata share of the cost of offsite mitigation measures be calculated.

Specifically, for Stanfield Cutoff and North Shore Drive, the traffic signal is estimated by the County to cost $250,000. The sum of the peak month leg volumes today is 17,400. The sum of the leg volumes in 2025 without the project is 21,576. The project adds 1220 vehicles per day to the intersection leg volumes. The project's pro rata share is calculated as follows: 1220/(21,576+1220-17,400), or 22.61 percent of $250,000. The project's pro-rata share of the off-site improvement cost is $56,523.

Specifically, for Stanfield Cutoff and Big Bear Boulevard, the eastbound right turn lane needs to be converted to an eastbound through lane. This will involve adding pavement on the north side of the west leg of the intersection. It is estimated the

amount of pavement needed is 12 feet wide by 300 feet long, plus a 600 foot 50 to 1 transition from the 12 feet added width back to zero feet added. This will involve 7,200 square feet of pavement at an estimated cost of $10 per square foot, or $72,000. The $10.00 per square foot is equivalent to $1.27 million for one lane mile in each direction. The sum of the peak month leg volumes today is 46,475. The sum of the leg volumes in 2025 without the project is 57,629. The project adds 1220 vehicles per day to the intersection leg volumes. The project's pro rata share is calculated as follows: 1220/(57,629+1220-46,475), or 9.86 percent of $180,000. The project's pro-rata share of the offsite improvement cost is $17,748.

SAFETY HAZARDS AND EMERGENCY ACCESS

5.5-4 *Project implementation may increase hazards to vehicles, pedestrians and bicyclists due to the proposed project. Analysis has concluded that with implementation of the recommended mitigation measures, impacts would be less than significant.*

The project would have access from State Route 38, which is the primary roadway serving the north shore area. The project includes the realignment of this Highway. The realignment would occur in two phases, with construction of the new alignment completed before the existing alignment is demolished in order to eliminate the potential for hampering emergency response activity or evacuation plans. The project would include two interior roads, accessible from State Route 38. Per the analysis contained in the *Traffic Analysis* report, the following conclusions have been made regarding internal circulation and potential safety hazards:

- Site Access. To assure smooth traffic operations for vehicles entering and exiting the site, a 150 foot left turn pocket on is recommended on North Shore Drive at each project access location. The County of San Bernardino has suggested that it should be a continuous left turn pocket across the frontage of the property. Because it is a State Highway, Caltrans would need to decide which they prefer.

  A STOP sign should be installed to control outbound traffic on all site access roadways to North Shore Drive. With more than one driveway, good emergency access is assured because there are two ways of reaching any point within the site. Maintain a high level of service along arterials by restricting parking and controlling roadway access.

  Landscape plantings and signs should be limited to 36 inches in height within 25 feet of project driveways to assure good visibility.

  As is the case for any roadway design, the County should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

- Internal Roadway Sizing. To identify future internal circulation needs to the project, future traffic volumes for internal roadways of the project have been determined. The maximum volume is approximately 400 vehicles per day, for which is a two-lane road is satisfactory.

- Internal Circulation. The traffic circulation internal to the proposed project has been reviewed from a traffic engineering viewpoint, and the findings are as follows:

  - Cul-de-sac Lengths: None of the cul-de-sacs have excessive length, which is important for emergency equipment access.

  - Four-Legged Intersections: On arterials, four legged intersections are desirable to reduce turning movements, and expedite traffic movement. On local streets, four legged intersections are undesirable. The proposed project has no four legged intersections on local streets.

  - Distance Between Intersections: It is desirable to place intersections at least two hundred feet apart. All intersections are at least 200 feet apart.

  - Grades: All grades are 10 percent or less, which is satisfactory.

  - Intersection Angle: Intersections at other than 90 degrees are undesirable. All intersecting streets are perpendicular to one another.

  - Visibility: All intersections are designed to afford adequate visibility.

It is concluded that the internal circulation is satisfactory in all aspects.

The *Traffic Analysis* report recommends mitigation measures to assure satisfactory traffic operations and good visibility. Implementation of the recommended mitigation measures would reduce potentially significant impacts to less than significant levels.

MITIGATION MEASURES

This section directly corresponds to the identified Impact Statements in the impacts subsection.

EXISTING CONDITIONS WITH PROJECT TRAFFIC ANALYSIS

5.5-1 For existing traffic conditions, the intersection of Stanfield Cutoff and Big Bear Boulevard currently requires the eastbound right turn lane to be converted to an eastbound through lane, through the intersection. The eastbound right turn lane is restricted to an eastbound through lane, and involves roadway widening. The project's pro rata share of these off-site road improvements is estimated to be $17,748.

YEAR 2006 TRAFFIC ANALYSIS

5.5-2 Refer to Mitigation Measure 5.5-1. No additional mitigation measures are recommended.

YEAR 2025 TRAFFIC ANALYSIS

5.5-3 For future traffic conditions, the intersection of Stanfield Cutoff and North Shore Drive shall require a traffic signal. The project's pro rata share of the signal is $56,523.

SAFETY HAZARDS AND EMERGENCY ACCESS

5.5-4a Parking shall be restricted on State Route 38.

5.5-4b A 150-foot eastbound left turn pocket shall be striped for traffic on North Shore Drive turning left into the project entry locations.

5.5-4c For future traffic conditions, intersection geometrics as recommended in Table 1b of the Kunzman Associates June 2003 *Traffic Analysis* report, shall be implemented.

5.5-4d All streets internal to the project shall be constructed to full ultimate cross-sections. ~~as adjacent development occurs.~~

5.5-4e A STOP sign shall be installed to control outbound traffic on all site access roadways onto North Shore Drive.

5.5-4f The County of San Bernardino shall periodically review traffic operations in the vicinity of the site once the project is constructed in order to assure that the traffic operations are satisfactory.

5.5-4g Landscape plantings and signs shall be limited to 36 inches in height within 25 feet of project driveways to assure good visibility.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Following implementation of recommended mitigation measures, Traffic and Circulation impacts would be reduced to a less than significant level.

5.6 AIR QUALITY

This Section evaluates air quality impacts associated with short construction and long-term buildout of the Moon Camp Project. Information in this Section is based primarily on the *CEQA Air Quality Handbook*, prepared by the South Coast Air Quality Management District (SCAQMD), April 1993 (as revised through November 1993), Air Quality Data (SCAQMD 1999 through 2003); the *Final Air Quality Management Plan*, prepared by the South Coast Air Quality Management District (August 2003); and the *Fawnskin 92-Dwellings Traffic Analysis*, prepared by Kunzman Associates, September 2003.

EXISTING CONDITIONS

SOUTH COAST AIR BASIN

The South Coast Air Basin (Basin), in which the Community of Fawnskin is located, is characterized as having a "Mediterranean" climate (a semi-arid environment with mild winters, warm summers and moderate rainfall). The Basin is a 6,600-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. Its terrain and geographical location determine the distinctive climate of the Basin, as the Basin is a coastal plain with connecting broad valleys and low hills.

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

CLIMATE

The climate in the basin is characterized by moderate temperatures and comfortable humidities with precipitation limited to a few storms during the winter season (November through April). The average annual temperature varies little throughout the Basin, averaging 75 degrees Fahrenheit. However, with a less pronounced oceanic influence, the eastern inland portions of the Basin show greater variability in annual minimum and maximum temperatures. All portions of the Basin have had recorded temperatures over 100 degrees in recent years. January is usually the coldest month at all locations while July and August are usually the hottest months of the year. Although the Basin has a semi-arid climate, the air near the surface is moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the Basin by off-shore winds, the ocean effect is dominant. Periods with heavy fog are frequent; and low stratus

clouds, occasionally referred to as “high fog” are a characteristic climate feature. Annual average relative humidity is 70 percent at the coast and 57 percent in the eastern part of the Basin. Precipitation is typically 9 to 14 inches annually in the Basin and is rarely in the form of snow or hail due to typically warm weather. The frequency and amount of rainfall is greater in the coastal areas of the Basin.

More specifically, the Community of Fawnskin enjoys an Alpine climate. The community is located in an area that intercepts water-laden clouds which can result in rainfall and/or snow of up to 35 to 45 inches. Precipitation at Big Bear Lake’s National Weather Service station from 1960 to 1995 averaged about 18 inches for each six-month period from October to March. The areas watershed is mountainous with steep upper slopes leading to a mildly sloping valley. The coolest month of the year is January with a mean monthly temperature of 32.4°F. The warmest month is July with a mean monthly temperature of 63.8°F.

SUNLIGHT

The presence and intensity of sunlight are necessary prerequisites for the formation of photochemical smog. Under the influence of the ultraviolet radiation of sunlight, certain original, or “primary” pollutants (mainly reactive hydrocarbons and oxides of nitrogen) react to form “secondary” pollutants (primarily oxidants). Since this process is time dependent, secondary pollutants can be formed many miles downwind from the emission sources. Because of the prevailing daytime winds and time-delayed nature of photochemical smog, oxidant concentrations are highest in the inland areas of Southern California. However, a majority of the smog in the Big Bear Valley is created by the transport of pollutants from Los Angeles, Riverside and San Bernardino Counties as opposed to local sources.

TEMPERATURE INVERSIONS

Under ideal meteorological conditions and irrespective of topography, pollutants emitted into the air would be mixed and dispersed into the upper atmosphere. However, the Southern California region frequently experiences temperature inversions in which pollutants are trapped and accumulate close to the ground. The inversion, a layer of warm, dry air overlaying cool, moist marine air, is a normal condition in the southland. The cool, damp and hazy sea air capped by coastal clouds is heavier than the warm, clear air that acts as a lid through which the marine layer cannot rise. The height of the inversion is important in determining pollutant concentration. When the inversion is approximately 2,500 feet above sea level, the sea breezes carry the pollutants inland to escape over the mountain slopes or through the passes. At a height of 1,200 feet, the terrain prevents the pollutants from entering the upper atmosphere, resulting in a settlement in the foothill communities. Below 1,200 feet, the inversion puts a tight lid on pollutants, concentrating them in a shallow layer over the entire coastal basin. Usually, inversions are lower before sunrise than during the daylight hours. Mixing heights for inversions are lower in the summer and more persistent, being partly responsible for the high levels of ozone observed during summer months in the Basin. Smog in Southern California is generally the result of these temperature inversions combining with coastal day winds and local mountains to contain the pollutants for long periods of time, allowing

them to form secondary pollutants by reacting with sunlight. The Basin has a limited ability to disperse these pollutants due to typically low wind speeds.

The area in which the Community of Fawnskin is located offers approximately 300 days/year of clear skies and sunshine, however, it is still susceptible to air inversions. This traps a layer of stagnant air near the ground where it is further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, furnaces and other sources.

AMBIENT AIR QUALITY STANDARDS

National air quality policies are regulated through the Federal Clean Air Act (FCAA) of 1970 and its 1977 and 1990 amendments. Pursuant to the CAA, the United States Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for six air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10}) and lead (Pb). These pollutants are referred to as criteria pollutants because numerical criteria have been established for each pollutant, which define acceptable levels of exposure. The EPA has revised the NAAQS several times since their original implementation and will continue to do so as the health effects of exposure to air pollution are better understood. The federal 1-hour ozone standard will remain in effect until the EPA formally implements the 8-hour standard.

Under the 1977 amendments to the FCAA, states with air quality that did not achieve the NAAQS were required to develop and maintain State Implementation Plans (SIPs). These plans constitute a federally enforceable definition of the states approach (or "plan") and schedule for the attainment of the NAAQS. Air quality management areas were designated as "attainment," "non-attainment" or "unclassified" for individual pollutants depending on whether or not they achieve the applicable NAAQS and CAAQS for each pollutant. In addition, California can designate areas as transitional. It is important to note that because the NAAQS and CAAQS differ in many cases, it is possible for an area to be designated attainment by the EPA (meets NAAQS) and non-attainment by the California Air Resources Board (CARB) (does not meet CAAQS) for the same pollutant.

Areas that were designated as non-attainment in the past, but have since achieved the NAAQS, are further classified as attainment-maintenance. The maintenance classification remains in effect for 20 years from the date that the area is determined by the EPA to meet the NAAQS. There are numerous classifications of the non-attainment designation, depending on the severity of non-attainment. For example, the O_3 non-attainment designation has seven subclasses: transitional, marginal, moderate, serious, severe-15, severe-17, and extreme. Areas that lack monitoring data are designated as unclassified areas. Unclassified areas are treated as attainment areas for regulatory purposes.

Table 5.6-1
Local Air Quality Levels

Pollutant	California Standard	Federal Primary Standard	Year	Maximum[3] Concentration	# of Days State Std. Exceeded	# of Days Federal Std. Exceeded
Carbon Monoxide[2]	9.0 ppm for 8 hour	9.0 ppm for 8 hour	1999 2000 2001 2002 2003	4.1 ppm 4.1 3.3 3.2 4.5	0 0 0 0 0	0 0 0 0 0
Ozone[1] (8 Hours)	NA	0.08 ppm for 8 hours	1999 2000 2001 2002 2003	0.14 ppm 0.15 0.14 0.14 0.14	NA NA NA NA NA	82 64 74 82 71
Ozone[1] (Hourly)	0.09 ppm for 1 hour	0.12 ppm for 1 hour	1999 2000 2001 2002 2003	0.17 ppm 0.18 0.17 0.16 0.16	93 85 18 91 84	30 18 26 22 34
Nitrogen Dioxide[2]	0.25 ppm for 1 hour	NA	1999 2000 2001 2002 2003	0.14 ppm 0.11 0.11 0.11 0.10	0 0 0 0 0	0 0 0 0 0
Particulate Matter (PM_{10})[1, 4, 5]	50 $\mu g/m^3$ for 24 hours	150 $\mu g/m^3$ for 24 hours	1999 2000 2001 2002 2003	47.0 $\mu g/m^3$ 49.0 74.0 52.0 47.0	0 0 2 5 0	0 0 0 0 0
Fine Particulate Matter ($PM_{2.5}$)[2,5]	65 $\mu g/m^3$ for 24 hours	65 $\mu g/m^3$ for 24 hours	1999 2000 2001 2002 2003	121.4 $\mu g/m^3$ 89.8 78.5 82.1 58.4	NA NA NA NA NA	4 2 5 3 0

ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
NA = not applicable
PM_{10} = particulate matter 10 microns in diameter or less
$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less
NM = not measured

NOTES:
1. Crestline Station, 24171 Lake Drive, Crestline, California. Located approximately 19 miles west of the project site.
2. San Bernardino Station, 24302 East 4th Street, San Bernardino, California. Located approximately 18 miles southwest of the project site.
3. Maximum concentration is measured over the same period as the California Standard.
4. PM_{10} exceedances are based on state thresholds established prior to amendments adopted on June 20, 2002.
5. PM_{10} and $PM_{2.5}$ exceedances are derived from the number of samples exceeded, not days.

Source: *ADAM Air Quality data Statistics*, California Air Resources Board, http://www.arb.ca.gov/adam/welcome.html

Despite implementing many strict controls, the SCAB still fails to meet the Federal air quality standards for three of the criteria pollutants: O_3, CO and PM_{10}. For State standards, the SCAB is designated as non-attainment for O_3 and PM_{10}.[1] Atmospheric concentrations of the other criteria pollutants do not exceed State or Federal standards.

[1] California Air Resources Board, *Proposed Amendments to the Area Designation Criteria and Area designations for State Ambient Air Quality Standards*, December 5, 2003.

ATTAINMENT STATUS

LOCAL AMBIENT AIR QUALITY

The SCAQMD operates several air quality monitoring stations within the Basin. The following air quality information briefly describes the various types of pollutants that are found within the South Coast Air Basin. Additionally, Table 5.6-2, *Air Pollution Sources, Effects and Standards,* provides information on the primary health related effects of the criteria pollutants.

Carbon Monoxide (CO)

CO is an odorless, colorless toxic gas that is formed by the incomplete combustion of fuels. Motor vehicles are by far the largest source of CO in the Basin. At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause headaches, dizziness, unconsciousness, and even death. CO also aggravates cardiovascular disease. For CO, the subject portion of the Basin is designated as an attainment area for State standards, however, as a non-attainment area for Federal standards.

Ozone (O_3)

Ground-level ozone, often referred to as smog, is not emitted directly, but is formed in the atmosphere through complex chemical reactions between NO_X and reactive organic gases (ROG) in the presence of sunlight. The principal sources of NO_X and ROG, often termed ozone precursors, are combustion processes (including motor vehicle engines) and evaporation of solvents, paints and fuels. Motor vehicles are the single largest source of O_3 precursor emissions in the SCAQMD. Exposure to O_3 can cause eye irritation, aggravate respiratory diseases and damage lung tissue, as well as damage vegetation and reduce visibility. The entire Basin is designated as a non-attainment area for State and Federal O_3 standards.

Oxides of Nitrogen (NO_X or Nitrogen Dioxide (NO_2))

NO_2, often used interchangeably with NO_X, is a reddish-brown gas that can cause breathing difficulties at high levels. Peak readings of NO_2 occur in areas that have a high concentration of combustion sources (e.g., motor vehicle engines, power plants, refineries, and other industrial operations) in the vicinity. The entire Basin is designated as an attainment area for State and Federal NO_2 standards.

Oxides of Sulfur (SO_X or Sulfur Dioxide (SO_2))

Sulfur Dioxide (SO_2) is a colorless, irritating gas with a “rotten egg” smell formed primarily by the combustion of sulfur-containing fossil fuels. Lead is a metal that is a natural constituent of air, water and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Sulfur dioxide is often used interchangeably with sulfur oxides (SO_X) and lead (Pb). Sulfur dioxide levels in all areas of the Basin do not exceed Federal or State standards. The Basin is designated as attainment for both State and Federal SO_2 standards. Since

ambient concentrations of lead have decreased in the Basin, the SCAQMD no longer monitors the presence of lead in ambient air.

Table 5.6-2
Air Pollution Sources, Effects and Standards

Air Pollutant	State Standard	Federal Primary Standard	Sources	Primary Effects
Ozone (O_3)	0.09 ppm, 1-hour average	0.08 ppm, 8-hour average	Atmospheric reaction of organic gases with nitrogen oxides in sunlight	Aggravation of respiratory and cardiovascular diseases, irritation of eyes, impairment of cardiopulmonary function, plant leaf injury
Carbon Monoxide (CO)	9.0 ppm, 8-hour average 20 ppm, 1-hour average	9.5 ppm, 8-hour average 35 ppm, 1-hour average	Incomplete combustion of fuels and other carbon-containing substances such as motor vehicle exhaust, natural events, such as decomposition of organic matter	Reduced tolerance for exercise, impairment of mental function, impairment of fetal development, death at high levels of exposure, aggravation of some heart diseases (angina)
Nitrogen Dioxide (NO_2)	0.25 ppm, 1-hour average	0.0534 ppm, annual avg.	Motor vehicle exhaust, high-temperature stationary combustion, atmospheric reactions	Aggravation of respiratory illness, reduced visibility, reduced plant growth, formation of acid rain
Sulfur Dioxide (SO_2)	0.25 ppm, 1-hr. avg. 0.04 ppm, 24-hr. avg. with ozone > = 0.10 ppm, 1 hr. avg. or TSP > = 100 μg/m^3, 24-hr. avg.	0.03 ppm, annual arithmetic mean 0.14 ppm, 24-hour average	Combustion of sulfur-containing fossil fuels, smelting of sulfur-bearing metal ores, industrial processes	Aggravation of respiratory diseases (asthma, emphysema), reduced lung function, irritation of eyes, reduced visibility, plant injury, deterioration of metals, textiles, leather finishes, coatings, etc.
Fine Particulate Matter (PM10)	20 μg/m^3, annual geometric mean > 50 μg/m^3, 24-hr. avg.	PM_{10}: 50 μg/m^3, annual arithmetic mean 150 μg/m^3, 24-hr. avg.	Stationary combustion of solid fuels, construction activities, industrial processes, industrial chemical reactions	Reduced lung function, aggravation of the effects of gaseous pollutants, aggravation of respiratory and cardio-respiratory diseases, increased coughing and chest discomfort, soiling, reduced visibility
	$PM_{2.5}$: 12 μg/m^3, annual geometric mean 65 μg/m^3, 24-hr. avg.	$PM_{2.5}$: 15 μg/m^3, annual geometric mean 65 μg/m^3, 24-hr. avg.		
Lead	1.5 μg/m^3, 30-day average	1.5 μg/m^3, calendar quarter	Contaminated soil	Increased body burden, impairment of blood formation and nerve conduction
Visibility Reducing Particles	Reduces visual range to less than 10 miles at relative humidity less than 70%, 8-hour avg (9am - 5pm).			Visibility impairment on days when relative humidity is less than 70 percent

Source: *CEQA Air Quality Handbook*, South Coast Air Quality Management District, 1993, and updated with current Federal ozone and $PM_{2.5}$ standards.

Particulate Matter (PM_{10})

PM_{10} refers to suspended particulate matter which is smaller than 10 microns or ten one-millionths of a meter. PM_{10} arises from sources such as road dust, diesel soot, combustion products, construction operations and dust storms. PM_{10} scatters light and significantly reduces visibility. In addition, these particulates penetrate into lungs and can potentially damage the respiratory tract. On June 19, 2003 the CARB adopted amendments to the statewide 24-hour particulate matter standards based upon requirements set forth in the Children's Environmental Health Protection Act (Senate Bill 25). The Federal 24-hour standard of 150 $\mu g/m^3$ was retained.

Fine Particulate Matter ($PM_{2.5}$)

Due to recent increased concerns over health impacts related to fine particulate matter (particulate matter 2.5 microns in diameter or less), both State and Federal $PM_{2.5}$ standards have been created. Particulate matter impacts primarily affect infants, children, the elderly and those with pre-existing cardiopulmonary disease. In 1997, the EPA announced new $PM_{2.5}$ standards. Industry groups challenged the new standard in court and the implementation of the standard was blocked. However, upon appeal by the EPA, the U.S. Supreme Court reversed this decision and upheld the EPA's new standards. The Federal Standard is 65 $\mu g/m^3$ over an average of 24 hours.

On June 20, 2002, CARB adopted amendments for statewide annual ambient particulate matter air quality standards. These standards were revised/established due to increasing concerns by

CARB that previous standards were inadequate, as almost everyone in California is exposed to levels at or above the current State standards during some parts of the year, and the statewide potential for significant health impacts associated with particulate matter exposure was determined to be large and wide-ranging.[2] Based upon a desire to set clean air goals throughout the State, the CARB created a new annual average standard for $PM_{2.5}$ at 12 $\mu g/m^3$. Currently, the CARB has issued a staff report, which recommends that the South Coast Air Basin be designated as non-attainment for State and Federal $PM_{2.5}$ standards[3].

Volatile Organic Compounds (VOCs or Reactive Organic Gasses (ROG))

Hydrocarbon compounds are any compounds containing various combinations of hydrogen and carbon atoms that exist in the ambient air. VOCs contribute to the formation of smog and/or may themselves be toxic. VOCs often have an odor and some examples include gasoline, alcohol and the solvents used in paints. There are no specific State or Federal VOC thresholds as they are regulated by individual air districts as O_3 precursors.

[2] California Environmental Protection Agency, Air Resources Board, *Staff Report: Public Hearing to Consider Amendments to the Ambient Air Quality Standards for Particulate Matter and Sulfates,* May 3, 2002.

[3] Ibid, page 4.8-3.

Visibility

Visibility can be defined as the distance that atmospheric conditions permit a person to see at any given time. Technically, visibility is defined as the farthest distance an observer can distinguish a large black object against the horizon. Reduced visibility causes aesthetic impairment of surroundings and also interferes with aircraft operations. Visibility may be impaired by natural or man-made sources, including natural aerosols such as precipitation, fog, soil particles, volcanic emissions, vegetation, sea spray and organic decomposition products; and man-made sources such as sulfates and nitrates. The greatest contribution to visibility reduction in the Basin is from light scattering by "fine particle" aerosols with the size range of 0.1 to 2 microns (a micron is one-millionth of a meter). Based on review of available technical data provided by CARB, visibility was not measured at SCAQMD Monitoring Stations between 1999 and 2003.

Total Suspended Particulates (TSP)

Total Suspended Particulates (TSP) is the name given to the solid matter suspended in the atmosphere. Approximately 9.5 percent of TSP is generated by stationary sources. This complicated mixture of natural and man-made materials includes soils particles, biological materials, sulfates, nitrates, organic (or carbon-containing compounds) and lead. A high volume sampler is used to determine TSP concentration by passing a measured column of air through a glass fiber filter. The filter then is weighed to determine the concentration of TSP, after which it is analyzed for lead, sulfate, and nitrate by an SCAQMD laboratory. TSP tends to be at higher concentrations in the day and has an unclear seasonal pattern. High dust levels result from strong winds and loose, arid soil. Larger dust particles pose a less serious health threat than small particles produced by fossil fuel combustion. TSP monitoring was discontinued in 1991.

Lead (Pb)

In the Basin, atmospheric lead is generated almost entirely by the combustion of leaded gasoline and contributes less than one percent of the material collected as TSP in 1982. Atmospheric lead concentrations have been reduced substantially in recent years due to the lowering of average lead content in gasoline. Exceedances of the State air quality standard for lead (monthly average concentration of 1.50 ug/m^3) now are confined to the densely populated portions of San Bernardino County where vehicle traffic is greatest.

REGULATORY FRAMEWORK

FEDERAL CLEAN AIR ACT

The FCAA (1977 amendments) 42 USC 7401 *et. seq*.) state that the federal government is prohibited from engaging in, supporting, providing financial assistance for, licensing, permitting or approving any activity that does not conform to an applicable SIP. Federal actions relating to transportation plans, programs and projects developed, funded, or approved under 23 USC of the Federal Transit Act

(40 USC 1601 *et. seq*.) are covered under separate regulations for transportation conformity.

In the 1990 FCAA amendments (FCAAA), the EPA included provisions requiring federal agencies to ensure that actions undertaken in non-attainment or attainment-maintenance areas are consistent with applicable SIPs. The process of determining whether or not a Federal action is consistent with an applicable SIP is called conformity.

The EPA General Conformity Rule applies only to federal actions that result in emissions of "non-attainment or maintenance pollutants", or their precursors, in federally designated non-attainment or maintenance areas. The EPA General Conformity Rule establishes a process to demonstrate that federal actions would be consistent with applicable SIPs and would not cause or contribute to new violations of the NAAQS, increase the frequency or severity of existing violations of the NAAQS, or delay the timely attainment of the NAAQS. The emissions thresholds that trigger requirements of the conformity rule for federal actions emitting nonattainment or maintenance pollutants, or their precursors, are called *de minimus* levels. The general conformity *de minimus* thresholds are defined in 40 CFR 93.153(b). The federal General Conformity Rule does not apply to federal actions in areas designated as non-attainment of only the CAAQS.

CALIFORNIA CLEAN AIR ACT

CARB administers the air quality policy in California. The CAAQS were established in 1969 pursuant to the Mulford-Carrell Act. These standards, included with the NAAQS in Table 4.8-1, are generally more stringent and apply to more pollutants than the NAAQS. In addition to the criteria pollutants, CAAQS have been established for visibility reducing particulates, hydrogen sulfide, and sulfates. The CCAA, which was approved in 1988, requires that each local air district prepare and maintain an air quality management plan (AQMP) to achieve compliance with CAAQS. These AQMP's also serve as the basis for preparation of the SIP for the State of California.

CARB establishes policy and statewide standards and administers the State's mobile source emissions control program. In addition CARB oversees air quality programs established by State statute, such as Assembly Bill (AB) 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

The SCAQMD is one out of 35 air quality management districts that have prepared Air Quality Management Plans (AQMPs) to accomplish the five percent annual reduction goal. The most recent AQMP was adopted in 2003. To accomplish its task, the AQMP relies on a multi-level partnership of governmental agencies at the federal, state, regional and local level.

The 2003 AQMP relies on a multi-level partnership of governmental agencies at the federal, state, regional and local level. These agencies (EPA, CARB, local governments, Southern California Association of Governments (SCAG) and the

SCAQMD are the primary agencies that implement the AQMP programs. The 2003 AQMP proposes policies and measures to achieve federal and state standards for improved air quality in the SCAB and those portions of the Salton Sea Air Basin (formerly named the Southeast Desert Air Basin) that are under SCAQMD jurisdiction.

The 2003 AQMP also addresses several state and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes and new air quality modeling tools. The 2003 AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the Ozone State Implementation Plan (SIP) for the SCAB for the attainment of the federal ozone air quality standard. However, the 2003 AQMP points to the urgent need for additional emission reductions (beyond those incorporated in the 1997/99 Plan) to offset increased emission estimates from mobile sources and meet all federal criteria pollutant standards within the time frames allowed under the Federal Clean Air Act (FCAA).

SCAG is responsible under the FCAA for determining conformity of projects, plans and programs with the SCAQMD AQMP. As indicated in the *AQMD Air Quality Analysis Guidance Handbook*, there are two main indicators of consistency:

- Whether the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP; and

- Whether the project would exceed the AQMP's assumptions for 2020 or increments based on the year of project build-out and phase.

TOXIC AIR CONTAMINANTS (TACS)

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern in Southern California. There are hundreds of different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases of hazardous materials during upset conditions. Health effects of TACs include cancer, birth defects, neurological damage, and death.

California regulates toxic air contaminants through its air toxics program, mandated in Chapter 3.5 (Toxic Air Contaminants) of the Health and Safety Code (H&SC Section 39660 et. seq.) and Part 6 (Air Toxics "Hot Spots" Information and Assessment) (H&SC Section 44300 et. seq.).

The CARB, working in conjunction with the Office of Environmental Health Hazard Assessment (OEHHA), identifies toxic air contaminants. Air toxic control measures may then be adopted to reduce ambient concentrations of the identified toxic air

contaminant below a specific threshold based on its effects on health, or to the lowest concentration achievable through use of best available control technology for toxics (T-BACT). The program is administered by the CARB. Air quality control agencies, including the SCAQMD, must incorporate air toxic control measures into their regulatory programs or adopt equally stringent control measures as rules within six months of adoption by the CARB.

The Air Toxics "Hot Spots" Information and Assessment Act, codified in the Health and Safety Code, required operators of specified facilities in the District to submit to the SCAQMD comprehensive emissions inventory plans and reports by specified dates (H&SC Section 39660 et. seq. and Section 44300 et. seq.). The SCAQMD reviews the reports and then places the facilities into high, intermediate, and low priority categories, based on the potency, toxicity, quantity, and volume of hazardous emissions, and on the proximity of potential sensitive receptors to the facility. Facilities designated as high priority (Category A) must prepare a health risk assessment. Those found to pose a significant risk are required to notify the surrounding population. The emissions inventory data are to be updated every two years.

Diesel exhaust is a growing concern in the Basin area and throughout California. The CARB in 1998 identified diesel engine particulate matter as a TAC. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Many of these toxic compounds adhere to the particles, and because diesel particles are very small, they penetrate deeply into the lungs. Diesel engine particulate matter has been identified as a human carcinogen. Mobile sources (including trucks, buses, automobiles, trains, ships and farm equipment) are by far the largest source of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections.

Prior to the listing of diesel exhaust as a TAC, California had already adopted various regulations that would reduce diesel emissions. These regulations include new standards for diesel fuel, emission standards for new diesel trucks, buses, autos, and utility equipment, and inspection and maintenance requirements for health duty vehicles. Following the listing of diesel engine particulate matter as a TAC, the CARB is currently evaluating what additional regulatory action is needed to reduce public exposure. The CARB does not plan on banning diesel fuel or engines. The CARB may consider additional requirements for diesel fuel and engines, however, as well as other measures to reduce public exposure.

SENSITIVE RECEPTORS

Certain land uses are particularly sensitive to air emissions, including schools, hospitals, rest homes, long-term medical and mental care facilities and parks and recreation areas.

Existing sensitive receptors within the vicinity of the project site include residential uses to the east along Highway 38, to the west along Oriole Lane and to the north along Flicker Road. Other sensitive receptors include the following:

Schools
- North Shore Elementary School (765 N. Stanfield Cutoff)
- Big Bear Middle School (41275 Big Bear Boulevard)

Library
- Big Bear Lake Branch Library (41930 Garstin Drive)

Hospitals
- Big Bear Valley Community Hospital (41870 Garstin Road)

EMISSIONS ESTIMATION PROCEDURE

Emissions are estimated using the Urban Emissions (URBEMIS) 2002 Model developed and tested by CARB and approved for use by the SCAQMD. The URBEMIS2002 model is an emissions estimation tool for land use and development projects. The model has been modified and enhanced to estimate construction and area source emissions for various air districts in California. Specific emission factors for each air basin, including the Basin, have been incorporated into the model that account for compliance with air basin specific requirements. Various default parameters specific to each region have been verified and approved by local regulatory agencies and are also included into the model. Additionally, the model includes the ability to selectively identify and account for various mitigation measures.

The SCAQMD, along with other air pollution agencies in California, is actively involved in maintaining and updating the model. The URBEMIS2002 model includes the following updates compared to URBEMIS2001: on-road mobile source emission factors from CARB's EMFAC2002 model have been incorporated into the URBEMIS model to calculate on-road source emissions for both construction and operation; emission factors for off-road mobile sources derived from CARB's off-road model have been incorporated into URBEMIS to estimate emissions from off-road construction equipment; the construction module has been substantially revised to correct problems identified in URBEMIS2001 and provide flexibility by allowing the user to allocate construction emissions by construction phase.

IMPACTS

SIGNIFICANCE CRITERIA

In accordance with CEQA, the effects of a project are evaluated to determine if they will result in a significant impact on the environment. An Environmental Impact Report (EIR) is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria, or standards, used to determine the significance of impacts may vary depending on the nature of the project. Air quality impacts resulting from the implementation of the proposed project could be considered significant if they cause any of the following to occur:

- Conflict with or obstruct implementation of the applicable air quality plan (refer to Impact Statement 5.6-3);

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation (refer to Impact Statements 5.6-1 and 5.6-2);

- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) (refer to Impact Statement 5.6-4);

- Exposes sensitive receptors to substantial pollutant concentrations (refer to Impact Statement 5.6-2); and/or

- Create objectionable odors affecting a substantial number of people (refer to Section 10.0, *Effects Found Not To Be Significant*).

The SCAQMD *CEQA Air Quality Handbook* establishes thresholds for pollutant emissions generated both during and following construction. Buildout of the proposed project would be required to implement control measures during construction activities in order to reduce the amount of emissions to below the significance thresholds, when possible. SCAQMD construction and operation thresholds are indicated in Table 5.6-3, *SCAQMD Thresholds of Significant Contribution to Regional Air Pollution*. As previously stated, the Basin is designated non-attainment for State standards for O_3 and PM_{10} and for CO under Federal standards. Any increase in these pollutants would create a significant and unavoidable air quality impact.[4]

Table 5.6-3
SCAQMD Thresholds of Significant Contribution to Regional Air Pollution

Pollutant	Threshold of Significant Effect	
	Construction Emissions	Operational Emissions
Reactive Organic Gases (ROG)	75 lbs/day	55 lbs/day
Oxides of Nitrogen (NOx)	100 lbs/day	55 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Particulate Matter (PM10)	150 lbs/day	150 lbs/day
Source: *CEQA Air Quality Handbook*, South Coast Air Quality Management District, 1997.		

SHORT-TERM AIR QUALITY IMPACTS

5.6-1 *Significant short-term air quality impacts would occur during site preparation and project construction. These impacts are considered significant before and after mitigation for ROG and NO_X emissions from construction equipment exhaust. Impacts would be less than significant*

[4] The SCAQMD is in the process of revising the *CEQA Air Quality Handbook*. Three chapters have been revised to date including Chapters 2 - Improving Air Quality, 3 – Basin Air Quality Information, and 4 – Early Consultation and Sensitive Receptor Siting Criteria.

for other pollutants. (Mitigation in this instance refers to applicable County Development Code Sections and SCAQMD Rules.)

Short-term air quality impacts would occur during grading and construction operations associated with implementation of the proposed project. The short-term air quality analysis considers cumulative construction emissions combined with the proposed project. The temporary impacts include:

- Particulate (fugitive dust) emissions from clearing and grading activities on-site;
- Exhaust emissions and potential odors from the construction equipment used on-site as well as the vehicles used to transport materials to and from the site;
- Off-site air pollutant emissions at the power plant serving the site, while temporary power lines are needed to operate construction equipment and provide lighting; and
- Exhaust emissions from the motor vehicles of the construction crew.

The above described power plant and vehicle emissions are generated during construction activities. Project-related power plant and motor vehicle emissions are further analyzed in the long-term impacts portion of this Section. Potential odors generated during construction operations are temporary in nature and are not considered to be an impact (refer to Section 10.0, *Effects Found Not To Be Significant*).

It should be noted that emissions produced during grading and construction activities are "short-term" in nature as they endure only for the duration of construction.

Fugitive Dust Emissions

Construction activities are a source of fugitive dust (PM_{10}) emissions that may have a substantial, temporary impact on local air quality. In addition, fugitive dust may be a nuisance to those living and working in the project vicinity. Fugitive dust emissions are associated with land clearing, ground excavation, cut and fill operations, and truck travel on unpaved roadways. Dust emissions also vary substantially from day to day, depending on the level of activity, the specific operations, and weather conditions.

Fugitive dust from grading and construction is expected to be short-term and would cease following project completion. Additionally, most of this material is inert silicates, rather than the complex organic particulates released from combustion sources, which are more harmful to health. Dust (larger than 10 microns) generated by such activities usually becomes more of a local nuisance than a serious health problem. Of particular health concern is the amount of PM_{10} (particulate matter smaller than 10 microns) generated as a part of fugitive dust emissions. As previously discussed, PM_{10} poses a serious health hazard; alone or in combination with other pollutants. The URBEMIS2002 computer model (adapted from the

URBEMIS7G model by the SCAQMD) calculates PM_{10} fugitive dust as part of the site grading emissions (refer to Table 5.6-4, below). Even with implementation of standard construction practices regarding dust control techniques (i.e., daily watering), limitations on construction hours, and adherence to SCAQMD Rule 403 (requires watering for inactive and perimeter areas, track out requirements, etc.), impacts from PM_{10} fugitive dust would be less than significant.

Table 5.6-4
Construction Emissions

Emissions Source	Pollutant (pounds/day)[1]			
	ROG	NOx	CO	PM_{10}
Unmitigated Emissions[2]	400.3	162.5	192.6	52.1
SCAQMD Threshold	75	100	550	150
Is Threshold Exceeded Before Mitigation?	***Yes***	***Yes***	***No***	***No***
Mitigated Emissions[4]	400.3	162.5	192.6	20.4
Is Threshold Exceeded After Mitigation?	***Yes***	***Yes***	***No***	***No***

ROG = reactive organic gases NOx = nitrogen oxides CO = carbon monoxide PM_{10} = fine particulate matter

NOTES:
[1] Emissions calculated using the URBEMIS2002 Computer Model as recommended by the SCAQMD and project specific construction data provided by the project applicant.
[2] Calculations include emissions from numerous sources including: site grading, construction worker trips, stationary equipment, diesel and gas mobile equipment, and asphalt off-gassing using a maximum amount of grading per day of 2.5 acres and 260 working days per year. For future lot development, air quality modeling assumes a conservative scenaric that roadway surfaces will be graded, and that rough grading will occur for the proposed pad foundations. Results are based on the maximum amount of site grading, construction and asphalt activity that would occur in one day. Due to the uncertainty of future pad foundations and the relatively small amounts of pollutants generated, fine grading has not been included in this analysis.
[3] Refer to Appendix 15.4, *Air Quality Data*, for assumptions used in this analysis, including quantified emissions reduction by mitigation measures. Emissions would exceed the SCAQMD quarterly construction emissions for NOx and ROG.
[4] The reduction/credits for construction emission mitigations are based on mitigations included in the URBEMIS2002 computer model and as typically required by the SCAQMD. The mitigations include the following: proper maintenance of mobile and other construction equipment and speed limitation on unpaved roads to 15 miles per hour.

Construction Equipment and Worker Vehicle Exhaust
(Significant after mitigation for NO_x emissions)

Exhaust emissions from construction activities include emissions associated with the transport of equipment, worker trips, emissions produced on-site as the equipment is used, and emissions from trucks to/from the site. Emitted pollutants would include CO, ROG, NO_x, and PM_{10}.

Table 5.6-4, *Construction Emissions*, presents exhaust emission factors for typical diesel-powered heavy equipment. Refer to Appendix 15.4, *Air Quality Data*, for a listing of mobile and stationary construction equipment included in these calculations. Computer model results are also included in Appendix 15.4. The maximum area estimated to be disturbed per day would total 2.5 acres. The modeling input assumes that a maximum amount of grading took place five days per week throughout the year (260 days). These assumptions are based upon a worst case scenario, based upon the rugged site conditions.

As indicated in Table 5.6-4, emissions associated with construction equipment within the project area are anticipated to exceed SCAQMD construction thresholds for NO_x and ROG. Feasible mitigation measures are not available to reduce the significance of short-term construction NO_x and ROG emissions to less than significant levels.

As such, short-term air emissions for this pollutant would be considered significant and unavoidable.

LONG-TERM OPERATIONAL IMPACTS

5.6-2 *The project would result in an overall increase in the local and regional pollutant load due to direct impacts from vehicle emissions and indirect impacts from electricity and natural gas consumption. Combined mobile and area source emissions would exceed SCAQMD thresholds for ROG, CO and PM_{10}. These exceedances are considered significant and cannot be mitigated to a less than significant level.*

The calculations for the following analysis are based upon the Traffic Study (refer to Section 5.5, *Traffic and Circulation*). Buildout of Moon Camp would occur incrementally over time beginning with the realignment/construction of North Shore Drive. The County of San Bernardino on a project-by-project basis would evaluate the exact details of each individual lot construction. However, for the purposes of this air quality emissions analysis, it was assumed that all of the residential lots would be built in one phase.

Long-term air quality impacts would consist of mobile source emissions generated from project-related traffic and from stationary source emissions generated directly from the natural gas consumed and indirectly from the power plant providing electricity to the project site. Emissions associated with each of these sources are discussed and calculated below.

Mobile Source Emissions Only: Regional Impacts

Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, ROG, NO_X, SO_X, and PM_{10} are all pollutants of regional concern. (NO_X and ROG react with sunlight to form O_3 or photochemical smog, and SO_X and PM_{10} are readily transported by wind currents). However, CO tends to be a localized pollutant, dispersing rapidly at the source. Long-term impacts to regional air quality levels are analyzed below.

As previously discussed, the Basin is a non-attainment area for Federal and State air quality standards for O_3 and PM_{10} and for CO (Federal standard only). Nitrogen oxides and ROG are regulated O_3 precursors. (A precursor is defined as a directly emitted air contaminant that, when released into the atmosphere, forms or causes to be formed or contributes to the formation of a secondary air contaminant for which an ambient air quality standard has been adopted). Project-generated vehicle emissions have been estimated using the URBEMIS2002 computer model (published by the SCAQMD and based on the URBEMIS7G model). This model predicts ROG, CO, NO_X, and PM_{10} emissions from motor vehicle traffic associated with new or modified land uses (refer to Appendix 15.4, *Air Quality Data*, for model input values used for this project with the model output). Project trip generation rates were based on the Project Traffic Study (refer to Section 5.5, *Traffic and Circulation*,

and Appendix 15.3, *Traffic Data*). Table 5.6-5, *Long-Term Project Emissions*, presents anticipated regional mobile emissions.

Area Source Emissions

The proposed project would generate electrical demand and heating demands resulting in natural gas and wood burning combustion. Electrical demand would result in electrical generation emissions from local power plants. As shown in Table 5.6-5, *Long-Term Project Emissions*, stationary source emissions generated directly from the natural gas consumed and wood burning, and indirectly from the power plant providing electricity to the project site would exceed SCAQMD thresholds with operation (ROG, CO and PM_{10}).

Residential Wood Burning Fireplaces

All burning creates harmful by-products of combustion, resulting in air pollution. Materials on the low end of the energy scale such as wood and charcoal create the most pollution. Sources on the high end of the energy scale or ladder, such as natural gas and propane burn very cleanly resulting in very little air pollution. The basic constituents of wood smoke pollutants are:[5]

- Particulates.[6] PM_{10}, $PM_{2.5}$, and Nanoparticulate particulates are tiny particles suspended in the air that are too small to be filtered out, and thus become embedded deep within the lungs. The most injurious are particles classified as PM_{10}, 10 microns in diameter or less. Wood smoke PM_{10} contains creosote, soot, and ash. Most smoke particles average less than one micron (one millionth of a meter), allowing them to remain airborne for 3 weeks. The particles are efficient vehicles for transporting toxic gases, bacteria and viruses deep into the lungs where they pass into the blood stream. Inhalation of PM_{10} causes coughing, irritation and permanent scarring and damage to the lungs resulting in decreased lung function and increases in respiratory illness. These effects become significant at averages less than 40 micrograms per cubic meter. Smoke from just one fireplace burning has been found to cause particulate levels to exceed 200 ug/m^3 in the outdoor air surrounding the neighboring property.

- Carcinogens. Polycyclic Aromatic Hydrocarbons (PAH): Residential wood burning is the source of 50 percent of airborne Polynuclear Organic Material (POM) in the U.S. POMs contain a group of compounds known as PAHs which include many Class A carcinogens. The U.S. EPA estimates the cancer risk from wood smoke is twelve times greater than that from equal amounts of tobacco smoke. Wood burning also creates dioxins (refer to Footnote 5).

[5] A Summary of the Emissions Characterization and Noncancer Respiratory Effects of Wood Smoke, 1993 EPA Report, EPA-453/R-93-036.

[6] Particulate pollution in the past decade has been measured as PM_{10}, that is particulate matter 10 microns in diameter or less, which is talcum powder size. Recently the focus has shifted to smaller diameter particles, $PM_{2.5}$, which denotes all particles 2.5 microns and smaller (bacteria sized). These small sizes are thought to be more injurious because they are deeply respirable, becoming lodged in the farthest recesses of the lungs. Smoke from wood combustion is almost entirely in this range.

- Dioxin. Carbon Monoxide: An odorless gas resulting from all burning but produced in large amounts when burning takes place with reduced oxygen, such as in wood stoves. Even small amounts in the air reduce the body's ability to transport oxygen, constrict muscles and blood vessels, stress the heart, and result in feeling cold, fatigued and nauseated. High CO levels are found indoors where wood is burned.

- Respiratory Irritants and Toxins. There are over 100 different chemicals and compound groups in emissions from burning wood. In addition to those noted above there are chemicals known to be toxic such as formaldehyde, propionaldehyde, acetaldehyde, isobutyraldehyde, phenol, cresols. Nitrogen dioxide released from burning wood impairs the respiratory system and reduces its ability to fight infection. This combines with the organic compounds to form ozone which makes breathing difficult. High levels of Volatile Organic Compounds are found in the emissions of lawn equipment, charcoal grills and many personal care and cleaning products.

The project proposes 92 single-family residential lots, which are assumed for the purposes of this analysis to have wood burning fireplaces. The URBEMIS2002 computer model generates worst-case particulate quantities based upon 8 hours of use per day during the winter months. Additionally, URBEMIS2002 predicts wood burning quantities for Carbon Monoxide (CO) and Reactive Organic Gases (ROG). However, these pollutants can be reduced through the installation of an Environmental Protection Agency (EPA) certified fireplace. If properly operated, the cleaner EPA certified fireplaces built after 1992 can decrease the level of polluting emissions by up to 85 percent and create the same amount of heat during the winter using 30 percent less wood. Additionally, the installation of a ceramic coating on the honeycomb inside a catalytic combustor has been proven to help the gases and particles in smoke burn faster and at lower temperatures. Alternatively, the installation of a natural gas burning fireplace with ceramic logs eliminates particulate emissions.

Recreational Boating Activities

Lot "C" is a gated entrance to the project, including a proposed boat dock, consisting of 100 boat slips, which would be available for use by residents of the tract and accessible by Lot "C". The types of vessels, which would be docked at the boat slips, would be comprised of outboard and personal watercraft. These boat engines, which have typically used simple two-stroke technology, contribute about 12 percent of hydrocarbon (HC) emissions from mobile sources. Emission standards for outboard and personal watercraft engines call for manufacturers to meet increasingly stringent HC levels over a nine-year phase-in period starting in 1998. By 2006 all manufacturers will produce engines with 75 percent lower HC emissions. The gradually decreasing emission standard allows manufacturers to determine the best approach for achieving the targeted reductions over time by allowing them to phase in the types of control technologies in the most sensible way, while minimizing the cost impact to the consumer.[7] With the Environmental Protection Agency's new regulation over outboard and personal watercraft (EPA420-F-96-012), marine

[7] United States Environmental Protection Agency, *Reducing Air Pollution from Nonroad Engines*, Office of Transportation and Air Quality, November 2000.

engines will be over 75 percent cleaner in 2006, as compared to marine engine technology in 1998. Since the reduction of HC emissions depends on sales of these newer technology engines, the EPA expects to achieve this reduction in HC emissions from marine engines by the year 2025. EPA expects a 50 percent reduction to occur by the year 2020.[8]

Total Project Operational Emissions: Area and Mobile Sources
(Significant for ROG, CO and PM_{10} emissions)

As shown in Table 5.6-5, the mobile source and area emissions associated with the proposed project would generate pollutant emissions in excess of SCAQMD thresholds. Thus, implementation of the proposed project would create a significant and unavoidable individual project impact from ROG, CO and PM_{10} emissions. The ROG emissions are primarily from the combustion of wood in the fireplaces. As the proposed project would exceed established ROG, CO and PM_{10} thresholds, the project would create a significant and unavoidable impact to regional levels of these pollutants.

Table 5.6-5
Long-Term Project Emissions[1]

Project	Pollutant (Pounds/Day)			
	ROG	NO_X	CO	PM_{10}
(unmitigated)				
• Area Source Emissions[2]	1,035.1	14.5	1,137.3	155.8
• Vehicle Emissions	10.1	17.4	127.8	14.3
Total Unmitigated Emissions	1,045.2	31.9	1,265.1	170.1
SCAQMD Threshold	55	55	550	150
Is Threshold Exceeded? (Significant Impact?)	**Yes**	**No**	**Yes**	**Yes**

ROG = reactive organic gases NO_X = nitrogen oxides CO = carbon monoxide PM_{10} = fine particulate matter

NOTES:
1 – Based on URBEMIS2002 modeling results, worst-case seasonal emissions for area and mobile emissions, and trip rate data provided in the project Traffic Study.
2 – Operational scenario assumes 25 percent utilization of outdoor wood burning stoves and 100% utilization of fireplaces.

Localized CO Emissions

The SCAQMD recommends performing a carbon monoxide hotspots analysis when a project increases the intersection capacity utilization (ICU) by 0.02 (2 percent) for any intersection with a Level of Service (LOS) rating of D or worse. Carbon monoxide is the pollutant of major concern along roadways since the most notable source of carbon monoxide is vehicles. For this reason carbon monoxide concentrations are usually indicative of the local air quality generated by the roadway network, and are used as an indicator of its impacts upon local air quality. CO is an odorless, colorless toxic gas that is formed by the incomplete combustion of fuels

[8] *National Management Measures Guidance to Control Nonpoint Source Pollution from Marinas and Recreational Boating*, United States Environmental Protection Agency, November 2001.

that at high concentrations can lead to a localized plumes commonly referred to as "Carbon Monoxide Hotspots". A screening level analysis was performed per SCAQMD protocol for Year 2006 and Year 2025 peak month conditions for the following intersections:

- Stanfield Cutoff/Big Bear Boulevard
- Stanfield Cutoff/North Shore Drive

In order to simulate a worst-case conservative scenario, the intersections were screened in existing configuration without improvements. The carbon monoxide screening utilized the intersection analysis as contained within the Project traffic report. Based upon the Traffic Report, the project would generate 880 daily trips, 69 of which would occur during the morning peak hour and 93 of which would occur during the evening peak hour. As illustrated in Table 5.6-6 – *Carbon Monoxide Screening Analysis*, the maximum intersection delay increase due to the Project is 1.5 percent at Stanfield Cutoff and Big Bear Boulevard. Therefore, there would be a less than significant impact in regards to Carbon Monoxide Hotspots.

Table 5.6-6
Carbon Monoxide Screening Analysis

Intersection	Scenario					
	Year 2006 No Project ICU (LOS)	Year 2006 With Project ICU (LOS)	Intersection Delay Increase	Year 2025 No Project ICU (LOS)	Year 2025 With Project ICU (LOS)	Intersection Delay Increase
Stanfield Cutoff/Big Bear Blvd.						
AM Peak Hour	0.861 (D)	0.876 (D-)	0.015 (1.5%)	0.827 (D+)	0.839 (D)	0.012 (1.2%)
PM Peak Hour	1.097 (F-)	1.102 (F-)	0.005 (0.5%)	1.250 (F-)	1.255 (D+)	0.005 (0.5%)
Stanfield Cutoff/North Shore Dr.						
AM Peak Hour	- (B)	- (B)	-	- (A+)	- (A+)	-
PM Peak Hour	- (B)	- (B)	-	- (A+)	- (A+)	-

ICU = Intersection Capacity Utilization LOS = Level of Service
Notes:
1 – ICU and LOS derived from the Project Traffic Report Dated September 2003.
2 – Values reflect existing unimproved roadway conditions for peak month traffic data.

CONSISTENCY WITH AIR QUALITY MANAGEMENT PLAN

5.6-3 *The project would not conflict with the Air Quality Management Plan (AQMP). Analysis has concluded that the proposed project is consistent with the AQMP criteria.*

As noted under the Significance Criteria discussion, a potentially significant impact to air quality would occur if the project would conflict with or obstruct the implementation of the applicable air quality plan. Although the project would represent an incremental negative impact to air quality in the Basin, of primary concern is that project-related impacts have been properly anticipated in the regional

air quality planning process and reduced whenever feasible. Therefore, it is necessary to assess the project's consistency with the AQMP.

According to the SCAQMD *CEQA Air Quality Handbook*, the purpose of the consistency finding is to determine if a project is inconsistent with the assumptions and objectives of the regional air quality plans, and thus if it would interfere with the region's ability to comply with federal and State air quality standards. If the project is inconsistent, local governments need to consider project modifications or inclusion of mitigation to eliminate the inconsistency. It is important to note that even if a project is found consistent it could still have a significant impact on air quality under CEQA. Consistency with the AQMP means that a project is consistent with the goals, objectives, and assumptions in the respective plan to achieve the federal and State air quality standards.

As indicated in SCAQMD's *CEQA Air Quality Handbook*, there are two main indicators of consistency:

- Whether the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP; and

- Whether the project would exceed the AQMP's assumptions for 2010 or increments based on the year of project build-out and phase.

Since the project would only create an additional 880 trips, the AQMP's assumptions would not be exceeded. Additionally, the Applicant will pay its fair share contribution to implement necessary improvements to improve the level of service. Therefore, the project would be considered consistent with the AQMP in this regard.

The project would result in an increase in the severity of existing air quality violations. The Basin is presently in non-attainment for O_3 and PM_{10} air quality standards (both State and Federal standards) and CO (Federal standards). As indicated in Table 5.6-5, the mobile source and area emissions associated with the proposed project would generate pollutant emissions in excess of SCAQMD thresholds. This increase in the severity of the existing violations would make the proposed development inconsistent with one of the two indicators of consistency. Project implementation would result in a significant unavoidable impact with respect to consistency with the AQMP.

CUMULATIVE

5.6-4 *Cumulative impacts to regional air quality resulting from development of the proposed Project would be less than significant.*

The annual short-term and long-term emissions associated with the proposed Project and cumulative projects indicated in Section 4.0, *Basis for Cumulative Analysis*, would be dependent on the internal phasing. Adherence to SCAQMD rules and regulations would help to alleviate potential impacts related to cumulative conditions. However, the build-out, sale and occupancy of the proposed residences would be

controlled by market demand. The primary post-construction air quality impacts from the development of the Project would result from operational emissions from area and mobile sources. A comparison of the projected emissions for the Basin in the 2003 AQMP and the emission estimates from development of the Project help determine the extent of the air quality impacts that the Project would have on the environment and surrounding air quality. Projected Basin emission estimates have been determined based on the 2003 AQMP estimates for years 2000, 2006 and 2010. Projected emissions for each pollutant were extrapolated from the 2003 AQMP based on the trend of each pollutant from 2000 to 2010. Table 5.6-7, *Projected Emission Estimates for Basin from the 2003 AQMP Compared to Project Emissions*, lists the percent comparison of the Project estimates with the projected Basin estimates. From the emissions presented, it is evident that emissions from the Project are less than 0.01 percent of the total projected Basin emissions. Therefore buildout of Moon Camp would have a less than significant impact on the overall air quality within the Basin.

Table 5.6-7
Projected Emission Estimates for Basin
from the 2003 AQMP Compared to Project Emissions

Pollutant	Year 2020 Emissions Estimates (lbs/day)		
	Projected AQMP Emissions	Moon Camp	Percent Change
ROG	1,182,000	1,045.2	0.088
NO_X	839,000	31.9	0.004
CO	3,490,000	1,265.1	0.036
PM_{10}	992,000	170.1	0.017

NOTE: Year 2020 AQMP emissions are linearly extrapolated based on 2000 to 2010 emission trends in the 2003 AQMP.

MITIGATION MEASURES

The following mitigation measures directly correspond to the identified impact statements provided in the impacts Subsection for the proposed project:

SHORT-TERM AIR QUALITY IMPACTS

5.6-1 In accordance with the County Development Code and SCAQMD Rules, the Project Applicant shall incorporate the following measures during the construction phase of the Project to the satisfaction of the SCAQMD and County of San Bernardino. Compliance with this measure is subject to periodic field inspections by the SCAQMD and County of San Bernardino.

Grading:

Apply non-toxic soil stabilizers according to manufacturer's specifications to all inactive construction areas (previously graded for ten days or more);

- Replace ground cover in disturbed areas as quickly as possible;
- Enclose, cover, water two times daily or apply non-toxic soil binders in accordance to manufacturer's specifications to exposed piles (i.e., gravel, sand, dirt) with 5% or greater silt content;
- Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph; and
- All trucks hauling dirt, sand, soil, or other loose materials shall be covered and shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer).

Paved Roads:

- Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads.

LONG-TERM OPERATIONAL IMPACTS

5.6-2 To the extent feasible, the project shall incorporate the installation of EPA-certified wood burning stoves or fireplaces. If this is not feasible, then the installation of a ceramic coating on the honeycomb inside a catalytic combustor shall be investigated as a feasible alternative. Alternatively, the use of natural gas fireplaces may be used as a feasible alternative.

CONSISTENCY WITH AIR QUALITY MANAGEMENT PLAN

5.6-3 No mitigation measures are recommended.

CUMULATIVE

5.6-4 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

The following air quality impacts would remain significant and unavoidable following mitigation:

- ROG and NO_X from construction activities;
- Project Operations: Exceedance of State and/or Federal emission levels (ROG, CO and PM_{10}) from project operations; and

- Project implementation would result in a significant unavoidable impact with respect to consistency with the AQMP.

If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with Section 15093 of CEQA.

5.7 NOISE

The purpose of this Section is to analyze Project-related noise source impacts on-site and to surrounding land uses. Mitigation measures are also recommended to minimize the noise impacts of the Project. This Section evaluates short-term construction related impacts as well as long-term buildout conditions. Information in this Section was obtained from the County of San Bernardino General Plan and Development Code and traffic information contained in the *Traffic Analysis* report (refer to Section 5.5, *Traffic and Circulation*, and Appendix 15.3, *Traffic Data*). Noise impacts to biological resources are addressed in Section 5.8, *Biological Resources*. Refer to Appendix 15.5, *Noise Data*, for additional information.

EXISTING CONDITIONS

DEFINITIONS

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In general, a 1 dBA change in the sound pressure levels of a given sound is detectable only under laboratory conditions. A 3 dBA change in sound pressure level is considered a “just detectable” difference in most situations. A 5 dBA change is readily noticeable and a 10 dBA change is considered a doubling (or halving) of the subjective loudness. It should be noted that, generally speaking, a 3 dBA increase or decrease in the average traffic noise level is realized by a doubling or halving of the traffic volume; or by about a 7 mile per hour (mph) increase or decrease in speed.

In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud; 20 dBA higher four times as loud; and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Examples of various sound levels in different environments are shown in Table 5.7-1, *Sound Levels and Human Response.* There are three general methods used to measure sound over a period of time: the Community Noise Equivalent Level (CNEL), the equivalent energy level (Leq), and the Day/Night Average Sound Level (Ldn), as defined below.

Table 5.7-1
Sound Levels and Human Response

Noise Source	dBA Noise Level	Response
	150	
Carrier Jet Operation	**140**	Harmfully Loud
	130	Pain Threshold
Jet Takeoff *(200 ft.)* Discotheque	**120**	
Unmuffled Motorcycle Auto Horn *(3 ft.)* Rock'n Roll Band Riveting Machine	**110**	Maximum Vocal Effort Physical Discomfort
Loud Power Mower Jet Takeoff *(2000 ft.)* Garbage Truck	**100**	Very Annoying Hearing Damage (Steady 8-Hour Exposure)
Heavy Truck *(50 ft.)* Pneumatic Drill *(50 ft.)*	**90**	
Alarm Clock Freight Train *(50 ft.)* Vacuum Cleaner *(10 ft.)*	**80**	Annoying
Freeway Traffic *(50 ft.)*	**70**	Telephone Use Difficult
Dishwashers Air Conditioning Unit *(20 ft.)*	**60**	Intrusive
Light Auto Traffic *(100 ft.)*	**50**	Quiet
Living Room Bedroom	**40**	
Library Soft Whisper *(15 ft.)*	**30**	Very Quiet
Broadcasting Studio	**20**	Just Audible
	10	Threshold of Hearing

Source: Outdoor Noise in the Metropolitan Environment, Melville C. Branch and R. Dale Beland, 1970 (p. 2).

CNEL. The predominant community noise rating scale used in California for land use compatibility assessment is the Community Noise Equivalent Level (CNEL). The CNEL reading represents the average of 24 hourly readings of equivalent levels, known as Leq's, based on an A-weighted decibel with upward adjustments added to account for increased noise sensitivity in the evening and night periods. These adjustments are +5 dBA for the evening (7 p.m. to 10 p.m.), and +10 dBA for the night (10 p.m. to 7 a.m.). CNEL may be indicated by "dBA CNEL" or just "CNEL."

Leq. The Leq is the sound level containing the same total energy over a given sample time period. The Leq can be thought of as the steady (average) sound level which, in a stated period of time, would contain the same acoustic energy as the time-varying sound level during the same period. Leq is typically computed over 1, 8 and 24-hour sample periods.

Ldn. Another commonly used method is the day/night average level or Ldn. The Ldn is a measure of the 24-hour average noise level at a given location. It was adopted by the United States Environmental Protection Agency (EPA) for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the Leq. The Ldn is calculated by averaging the Leqs for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10 p.m. to 7 a.m.), by a 10 dBA to account for the increased sensitivity of people to noises that occur at night. The maximum noise level recorded during a noise event is typically expressed as Lmax. The sound level exceeded over a specified time frame can be expressed as Ln (i.e., L90, L50, L10, etc.). L50 equals the level exceeded 50 percent of the time.

HUMAN RESPONSES TO SOUND

Human response to sound is highly individualized. Annoyance is the most common issue regarding community noise. The percentage of people claiming to be annoyed by noise will generally increase with the environmental sound level. However, many factors will also influence people's response to noise. Thee factors can include the character of the noise, the variability of the sound level, the presence of tones or impulses, and the time of day of the occurrence. Additionally, non-acoustical factors, such as the person's opinion of the noise source, the ability to adapt to the noise, the attitude towards the source and those associated with it, and the predictability of the noise, will all influence people's response. As such, response to noise varies widely from one person to another and with any particular noise, individual responses will range from "highly annoyed" to "not annoyed".

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

This section describes the laws, ordinances, regulations and standards that are applicable to mixed land use developments and the proposed Project. Regulatory requirements related to environmental noise are typically promulgated at the local level. However, federal and state agencies provide standards and guidelines to the local jurisdictions.

STATE OF CALIFORNIA GUIDELINES

California Environmental Quality Act. CEQA was enacted in 1970 and requires that all known environmental effects of a project be analyzed, including environmental noise impacts. Under CEQA, a project has a potentially significant impact if the project exposes people to noise levels in excess of standards established in the local general plan or noise ordinance. Additionally, under CEQA, a project has a potentially significant impact if the project creates a substantial increase in the ambient noise levels in the project vicinity above levels existing without the project. If a project has a potentially significant impact, mitigation measures must be considered. If mitigation measures to reduce the impact to less than significant are not feasible due to economic, social, environmental, legal, or other conditions, the most feasible mitigation measures must be considered.

California Government Code. California Government Code Section 65302 (f) mandates that the legislative body of each county and city adopt a noise element as part of their comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services as shown in Table 5.7-2, *Land Use Compatibility for Community Noise Environments.* The guidelines rank noise land use compatibility in terms of "normally acceptable", "conditionally acceptable" and "clearly unacceptable" noise levels for various land use types. Single-family homes are "normally acceptable" in exterior noise environments up to 60 CNEL and "conditionally acceptable" up to 70 CNEL. Multiple-family residential uses are "normally acceptable" up to 65 CNEL and "conditionally acceptable" up to 70 CNEL. Schools, libraries and churches are "normally acceptable" up to 70 CNEL, as are office buildings and business, commercial and professional uses.

COUNTY OF SAN BERNARDINO NOISE STANDARDS

According to the San Bernardino County General Plan, areas within San Bernardino County will be designated as "noise impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in the Tables 5.7-3, *Interior/Exterior Noise Level Standards – Mobile Noise Sources*, and Table 5-7-4, *Hourly Noise Level Performance Standards – Locally Regulated Sources*.[1]

LOCATION OF SENSITIVE RECEPTORS

Certain land uses are particularly sensitive to noise, including schools, hospitals, rest homes, long-term medical and mental care facilities and parks and recreation areas. Residential areas are also considered noise sensitive, especially during the nighttime hours.

Existing sensitive receptors within the vicinity of the project site include residential uses to the east along Highway 38, to the west along Oriole Lane and to the north along Flicker Road. Other sensitive receptors include the following:

[1] Source: San Bernardino County General Plan, Section II Planning Issues, Man-Made Hazards – Noise, page II-B1-7.

Schools
- North Shore Elementary School (765 N. Stanfield Cutoff)
- Big Bear Middle School (41275 Big Bear Boulevard)

Library
- Big Bear Lake Branch Library (41930 Garstin Drive)

Hospitals

- Big Bear Valley Community Hospital (41870 Garstin Road)

Table 5.7-2
Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure			
	Ldn or CNEL, dBA			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential - Low Density, Single-Family, Duplex, Mobile Homes	50 - 60	55 - 70	70-75	75-85
Residential - Multiple Family	50 - 65	60 - 70	70 - 75	70 - 85
Transient Lodging - Motel, Hotels	50 - 65	60 - 70	70 - 80	80 - 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 - 70	70 - 80	80 - 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 - 70	NA	65 - 85
Sports Arenas, Outdoor Spectator Sports	NA	50 - 75	NA	70 - 85
Playgrounds, Neighborhood Parks	50 – 70	NA	67.5 - 75	72.5 - 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 70	NA	70 - 80	80 - 85
Office Buildings, Business Commercial and Professional	50 – 70	67.5 - 77.5	75 - 85	NA
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 - 80	75 - 85	NA

Source: General Plan Guidelines, Office of Planning and Research, California, November 1998, page 187.

Notes:
NORMALLY ACCEPTABLE - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
CONDITIONALLY ACCEPTABLE - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
NORMALLY UNACCEPTABLE - New Construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
CLEARLY UNACCEPTABLE - New construction or development should generally not be undertaken.
NA: Not Applicable

Table 5.7-3
Interior/Exterior Noise Level Standards – Mobile Noise Sources

Land Use		Ldn (or CNEL), dB	
Categories	**Uses**	**Interior***	**Exterior****
Residential	Single and multi-family, duplex, mobile homes	45	60***
Commercial	Hotel, motel, transient lodging Commercial retail, bank, restaurant Office building, research and development, professional offices Amphitheater, concert hall, auditorium, movie theater	45 50 45 45	60*** N/A 65 N/A
Institution/Public	Hospital, nursing home, school classroom, church library	45	65
Open Space	Park	N/A	65

* Indoor Environment excluding: bathrooms, kitchen, toilets, closets and corridors

** Outdoor environment limited to:
Private yard of single family dwellings
Multi-family private patios or balconies
Mobile home parks
Hospital/office building patios
Park scenic areas
School playgrounds
Hotel and motel recreation areas

*** An exterior noise level up to 65 dB (or CNEL) will be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level will necessitate the use of air conditioning or mechanical ventilation.

Source: San Bernardino County General Plan, Section II – Planning Issues, Man-Made Hazards – Noise, Figure II-8. pg II-B1-6.

Table 5.7-4
Hourly Noise Level Performance Standards – Locally-Regulated Sources*

Land Use Category	7:00 a.m.– 10:00 PM		10:00 p.m. – 7:00 AM	
	Leq	**Lmax**	**Leq**	**Lmax**
Residential or other noise-sensitive receivers	55 dBA	75 dBA	45 dBA	65 dBA

* Noise sources which are stationary and not pre-empted from local noise control. Pre-empted sources include vehicles operated on public roadways, railroad line operations and aircraft in flight.

Source: San Bernardino County General Plan, Section II – Planning Issues, Man-Made Hazards – Noise, Figure II-9. pg II-B1-7.

Churches [2]

- Seventh Day Adventist (340 E. North Shore Drive)
- St. Joseph's Catholic Church of Big Bear (42242 North Shore Drive)
- Church of Jesus Christ of Latter-Day Saints (400 E. North Shore Drive)
- St. Columba's Episcopal Church (42324 North Shore Drive)
- Shepherd in the Pines Lutheran Church (42450 North Shore Drive)
- Center for Creative Living (816 W. Big Bear Boulevard)
- First Baptist Church of Big Bear Valley (41960 Big Bear Boulevard)
- Church of Christ (41035 Big Bear Boulevard)
- Bear Valley Community Church (40946 Big Bear Boulevard)
- Assembly of God (41965 Garstin Road)
- Big Bear Believer's Chapel (42180 Moonridge Road)
- First Church of Christ Scientist (547 Cottage Lane)
- Big Bear Foursquare Church (101 E. Mojave)
- Big Bear Christian Center (800 Greenspot)
- Jehovah's Witnesses (255 Catalina Street)
- United Methodist Church) (1001 Holden Avenue)
- Calvary Chapel of Big Bear (713 Stocker Road)
- Presbyterian Church (575 Prairie Lane)

Parks and Recreational Areas

- Grout Bay Park (located at southwestern corner of Grout Bay);
- Grout Bay Recreation Area (located west of Grout Bay);
- Dana Point Park (located at northern side of Grout Bay);
- Serrano Campgrounds (located southwest of the intersection of Holcomb Valley Road and Highway 38);
- Meadows Edge Park (Located to the east of Bluebird Lane and adjacent to the northern side of Big Bear Lake);
- San Bernardino National Forest Lands (refer to Section 5.8, *Biological Resources*); and
- Big Bear Lake (also refer to Section 5.8, *Biological Resources*).

EXISTING NOISE ENVIRONMENTS

COMPUTER MODELING

The existing and future roadway noise levels within the vicinity of the proposed Project were projected using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) together with several roadway and site parameters. These parameters determine the projected impact of vehicular traffic noise and include the roadway cross-section (e.g., number of lanes), the roadway width, the average daily traffic (ADT), the vehicle travel speed, the percentages of auto and truck traffic, the roadway grade, the angle-of-view, the site conditions ("hard" or "soft"), and the percent of total ADT which flows each hour throughout a 24-hour period. The model does not account for ambient noise levels (i.e., noise from adjacent land uses) or topographical differences between the roadway and

[2] Source: Big Bear Chamber of Commerce website. July 2002. http://www.bigbearchamber.com/church.htm

adjacent land uses. Noise projections are based on modeled vehicular traffic as derived from the Project Traffic Study.

A 35 to 45 mile per hour (mph) average vehicle speed was assumed for existing conditions (varies depending on roadway) based on empirical observations and posted maximum speeds along the adjacent roadways. ADT estimates were obtained from the Project traffic report (refer to Appendix 15.3, *Traffic Data*).

EXISTING NOISE LEVELS

Table 5.7-5, *Existing Traffic Noise Levels*, indicates the location of the 60, 65, and 70 CNEL noise contours associated with vehicular traffic along local roadways as modeled with the aforementioned FHWA computer model. Traffic noise along three major roadways was modeled to estimate existing noise levels from mobile traffic. These roadways include North Shore Drive, Stanfield Cutoff, and Big Bear Boulevard, as described in Table 5.7-5.

Table 5.7-5
Existing Traffic Noise Levels
(Based on Peak Month Traffic Volumes)

Roadway Segment	Average Daily Traffic	dBA @ 100 Feet from Roadway Centerline[1]	Distance from Roadway Centerline to: (Feet)		
			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour
North Shore Drive:					
West of Stanfield Cutoff	4,750	57.17	15	19	69
East of Stanfield Cutoff	6,900	58.79	19	41	88
Stanfield Cutoff:					
North of North Shore Dr.	125	32.22	0	1	2
North Shore Dr. to Big Bear Blvd.	5,625	57.90	17	36	77
South of Big Bear Blvd.	2,250	49.15	4	9	20
Big Bear Boulevard:					
West of Stanfield Cutoff	20,500	62.87	39	85	183
East of Stanfield Cutoff	18,100	62.32	36	78	168

Traffic data obtained from the *Traffic Analysis* report (refer to Appendix 15.3, *Traffic Data*).
Note:
[1] = 100 feet is the assumed distance to the midpoint of a receptor rear yard.

EXISTING WATERCRAFT NOISE LEVELS

Watercraft, including boats, jet skis, etc., constitute a periodic noise around the perimeter of Big Bear Lake. According to the Big Bear Municipal Water District, during the 1999 boating season, the average daily use of boats on the Lake was approximately 199 (refer to Section 5.2, *Recreation*).

Per the requirements of the Big Bear Municipal Water District, lake activities and boating operations must comply with the following general regulations:

- Speed Limit. 35 MPH maximum; 10 MPH from sunset to 7:00 AM; 5 MPH between buoys indicating same and the shoreline; 3 MPH in Papoose Bay, Canvasback Cove and Mallard Lagoon.

- Mufflers. No boat shall operate with excessive noise, per the requirements of Harbor and Navigation Code 654.

- Launching. Boats requiring trailers may be launched only from designated launch ramps. All other boats may be carried and launched at designated recreational or public access points around the Lake after obtaining a permit.

- Mooring. Mooring or tying to navigational markers is prohibited. Overnight mooring or beaching of boats along the shoreline is prohibited.

- Water-skiing. Hours of water-skiing are between 7:00 a.m. and sunset.

Harbor and Navigational Code 654 states that:

"Muffler requirements: The exhaust of every internal combustion engine used on any motorboat shall be effectively muffled at all times to prevent any excessive or unusual noise and as may be necessary to comply with the provisions of Section 654.05.

The provisions of this section shall not apply to motorboats competing under a local public entity or United States Coast Guard permit in a regatta, in a boat race, while on trial runs, or while on official trials for speed records during the time and in the designated area authorized by the permit. In addition, this section shall not apply to motorboats preparing for a race or regatta if authorized by a permit issued by the local entity having jurisdiction over the area where the preparations will occur."

Harbor and Navigational Code 654.05 states that:

"Motorboat noise: No person shall operate any motorboat in or upon the inland waters of this state in such a manner as to exceed the following noise levels:

(a) For engines manufactured before January 1, 1976, a noise level of 86 dBA measured at a distance of 50 feet from the motorboat.

(b) For engines manufactured on or after January 1, 1976, and before January 1, 1978, a noise level of 84 dBA measured at a distance of 50 feet from the motorboat.

(c) For engines manufactured on or after January 1, 1978, a noise level of 82 dBA measured at a distance of 50 feet from the motorboat.

(d) *Testing procedures employed to determine such noise levels shall be in accordance with the exterior noise level measurement procedure for pleasure motorboats recommended by the society of Automotive*

Engineers in its recommended practice designated SAEJ34. The department may, by regulation, amend such testing procedures when deemed necessary to adjust to advances in technology.

The provisions of this section shall not apply to motorboats competing under a local public entity or United States Coast Guard permit in a regatta, in a boat race, while on trial runs, or while on official trials for speed records during the time and in the designated area authorized by the permit. In addition, addition, this section shall not apply to motorboats preparing for a race or regatta if authorized by a permit issued by the local entity having jurisdiction over the area where the preparations will occur."

IMPACTS

SIGNIFICANCE CRITERIA

Appendix G, Initial Study Checklist, of the CEQA Guidelines contains analysis guidelines related to the assessment of noise impacts. These guidelines have been utilized as thresholds of significance for this analysis. As stated in Appendix G, a project may create a significant environmental impact if one or more of the following occurs:

- Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (refer to Impact Statements 5.7-1 to 5.7-5);
- Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels (refer to Impact Statements 5.7-1);
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (refer to Impact Statements 5.7-2, 5.7-3, and 5.7-4);
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (refer to Impact Statements 5.7-1, 5.7-3, and 5.7-4);
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels (refer to Section 10.0, *Effects Found Not To Be Significant*); and
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels (refer to Section 10.0, *Effects Found Not To Be Significant*).

Based on these standards, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts. If

a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant and unavoidable impact. The standards used to evaluate the significance of impacts are often qualitative rather than quantitative because appropriate quantitative standards are either not available for many types of impacts or are not applicable for some types of projects.

SIGNIFICANCE OF CHANGES IN AMBIENT NOISE LEVELS

A project is considered to have a significant noise impact where it causes an adopted noise standard to be exceeded for the project site or for adjacent sensitive receptors. In addition to being concerned about the absolute noise level that might occur when a new source is introduced into an area, it is also important to consider the existing noise environment. If the existing noise environment is quiet and the new noise source greatly increases the noise exposure, even though a criterion level might not be exceeded, an impact may occur. Lacking adopted standards for evaluating such impacts, general considerations for community noise environments are that a change of over 5 dBA is readily noticeable and, therefore, is considered a significant impact (refer to Table 5.7-6, *Significance of Changes in Cumulative Noise Exposure*).[3] Changes from 3 to 5 dBA may be noticed by some individuals and are, therefore considered an adverse environmental impact, since under these conditions sporadic complaints may occur. Changes in community noise levels of less than 3 dBA are normally not noticeable and are therefore considered less than significant.[4] Adverse impacts would result if increases in noise levels are audible (increases equal to, or greater than 3 dBA), although the noise level may not exceed the significant impact criteria specified above.

Table 5.7-6
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project (Ldn or CNEL)	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels by:
< 60 dBA	+ 5.0 dBA or more
60-65 dBA	+3.0 dBA or more
> 65 dBA	+1.0 dBA or more
Sources: FICON, FHWA, and Caltrans as applied by Brown-Buntin Associates, Inc., 1997.	

Potential impacts are grouped below according to topic. The numbered mitigation measures at the end of this Section directly correspond with the numbered impact statements.

[3] *Assessment of Noise with Respect to Community Response*, ISDR 1996, International Standardization, Switzerland.

[4] *Fundamentals and Abatement of Highway Traffic Noise*, Bolt, Beranek and Newman, 1973.

SHORT-TERM CONSTRUCTION NOISE AND VIBRATION IMPACTS

5.7-1 *Grading and construction within the Project area would result in temporary noise and/or vibration impacts to nearby noise sensitive receptors. Analysis has concluded that construction noise and vibration impacts would be less than significant following compliance with the County requirements.*

Construction activities are generally of relatively short duration, lasting from a few days to a period of months. Groundborne vibration, groundborne noise, and other types of construction related noise impacts would typically occur during the initial site preparation, which can create the highest levels of groundborne vibration and noise. Generally, site preparation has the shortest duration of all construction phases. Activities that occur during this phase include earthmoving, removal of existing roadways and compacting of soils. High groundborne noise levels, ground vibration and other miscellaneous noise levels can be created during this phase due to the operation of heavy-duty trucks, backhoes, and front-end loaders.

Noise levels typically range from 73 to 96 dBA at 50 feet from individual pieces of equipment.[5] The figures indicated in Table 5.7-7, *Typical Construction Equipment Noise Levels*, below, represents the "worst-case" day in which all equipment used during a given phase is operating. Because all equipment would not be operating on most days during construction, actual noise levels would, on many days, be lower than presented in Table 5.7-7.

Table 5.7-7
Typical Construction Equipment Noise Levels

Type of Equipment	Maximum Level, dB (50 feet; thence)
Scrapers	88
Bulldozers	87
Heavy Trucks	88
Backhoe	85
Pneumatic Tools	85

In addition to construction noise from the project site, the construction periods would also cause traffic noise along access routes to the site due to movement of equipment and workers on the site. The primary heavy equipment construction tools/vehicles are expected to be moved on to the site once during the initial grading/ construction period and would have a less than significant short-term effect on noise levels. Daily transportation of construction workers is not expected to cause a significant effect since this traffic would not be a substantial percentage of current daily volumes in the area, and would not be anticipated to increase traffic noise levels by more than 1 dBA.

As stated in Table 5.7-3, the maximum permitted noise exposure to residential uses from mobile noise sources is 60 dB (Ldn or CNEL). However, an exterior noise level

[5] United States EPA, 1971.

up to 65 dB (or CNEL) would be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of best available noise reduction technology and interior noise exposure does not exceed 45 dB (or CNEL) with windows and doors closed. According to Table 5.7-4, the maximum permitted noise exposure to residential uses from "locally-regulated sources" is 55 dBA Leq or 75 dBA Lmax from 7:00 a.m. to 10:00 p.m., and 45 dBA Leq or 65 dBA Lmax from 10:00 p.m. to 7:00 a.m. Locally regulated sources are stationary and not pre-empted from local noise control. Pre-empted sources include vehicles operated on public roadways, railroad line operations and aircraft in flight.

Project construction activities would temporarily increase local noise and vibration levels in the project study area and may temporarily exceed County standards. However, the County of San Bernardino Development Code exempts construction activities from adhering to County noise/vibration standards as long as construction is limited to the hours of 7:00 a.m. to 7:00 p.m. Monday to Saturday and prohibited on Sundays or Federal Holidays.

With adherence to the County Development Code and the noise-related policies in the County General Plan, and due to the relatively short period of construction, noise and vibration impacts are anticipated to be less than significant. Implementation of the recommended mitigation measure would ensure that impacts remain at or below less than significant levels.

LONG-TERM NOISE IMPACTS

5.7-2 *Implementation of the Moon Camp Project would generate additional vehicular travel on the surrounding roadway network, thereby resulting in noise level increases. Analysis has concluded that long-term noise impacts would be less than significant for all analyzed roadway segments in Year 2006 and Year 2025 traffic scenarios. No mitigation measures are recommended.*

Project implementation would result in additional traffic on adjacent roadways, thereby increasing vehicular generated noise in the vicinity of existing and proposed residential uses. As discussed in Section 5.3, *Traffic and Circulation*, traffic conditions were analyzed utilizing existing, Year 2006 and Year 2025 traffic volumes. For purposes of analyzing noise impacts associated with project-related traffic volumes, this section compares the following scenarios: 1) Existing Plus Other Development Traffic Conditions (Year 2006) versus Existing Plus Project Plus Other Development Traffic Conditions (Year 2006) and; 2) Existing Plus Other Development Traffic Conditions (Year 2025) versus Existing Plus Project Plus Other Development Traffic Conditions (Year 2025). Thus, in accordance with the project traffic study, with and without the proposed project scenarios were modeled for Year 2006 and Year 2025 traffic conditions.

According to the *Traffic Analysis* report, twenty-five percent (25%) of the project traffic distribution would be distributed to the west of the project site. The following roadways segments to the west of the project site would receive traffic from the Project site:

- North Shore Drive: North of Big Bear Boulevard and Dam (Existing ADT = 2,300)
- Rim of the World Highway: West of North Shore Drive (Existing ADT = 7,100)
- Big Bear Boulevard: East of North Shore Drive (Existing ADT = 7,300)

Assuming a worst-case scenario of 220 trips (25 percent of 880 trips) along North Shore Drive, north of Big Bear Boulevard and Dam, under existing conditions, the vehicular noise level along this roadway segment would increase by 0.42 dBA. Thus, noise impacts along this roadway segment would be less than significant based on the significance criteria as stated within Table 5.7-6.

Therefore, since the roadway segments along Rim of the World Highway (west of North Shore Drive) and Big Bear Boulevard (East of North Shore Drive), would receive fifteen percent (15%) and ten percent (10%) of the project traffic, respectively, coupled with the fact that traffic volumes are greater on these segments than on North Shore Drive, noise level increases along these segments as a result of project generated traffic would be less than 0.42 dBA. Thus, according to the significance criteria as stated within Table 5.7-6, noise impacts along these roadway segments would be les than significant under existing and future traffic scenarios.

YEAR 2006 TRAFFIC CONDITIONS

Noise levels within the vicinity of the proposed project area were modeled for with and without project scenarios for 2006 traffic conditions to determine the location and extent of future vehicular generated noise conditions. Table 5.7-8, *Exterior Noise Exposure Adjacent to Nearby Roadways, 2006*, indicates the noise increase and/or decrease for the analyzed roadways within the County of San Bernardino and City of Big Bear Lake. According to Table 5.7-8, under the "2006 Without Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 32 to 63 dBA. The highest noise levels would occur on Big Bear Boulevard, west of Stanfield Cutoff. The lowest noise levels would occur along Stanfield Cutoff (north of North Shore Drive).

As stated in Table 5.7-8, under the "2006 With Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 32 to 63 dBA. Similar to the "2006 Without Project" scenario, the highest and lowest noise levels would occur along Big Bear Boulevard (west of Stanfield Cutoff) and Stanfield Cutoff (north of North Shore Drive), respectively.

Table 5.7-8 also compares noise levels under the "2006 Without Project" scenario with the "2006 With Project" scenario. Based on the information cited in Table 5.7-8, all roadway segments comparatively analyzed would experience a noise increase of less than 1 dBA at 100 feet from the roadway centerline. Thus, noise impacts along all the roadway segments would be less than significant based on the significance criteria as stated within Table 5.7-6, *Significance of Changes in Cumulative Noise Exposure*.

Table 5.7-8
Exterior Noise Exposure Adjacent to Nearby Roadways, 2006
(Based on Peak Month Traffic Volumes)

Roadway Segment	2006 Without Project					2006 With Project					Difference in dBA @100 Feet from Roadway
	Average Daily Traffic	dBA @ 100 Feet from Roadway Centerline[1]	Distance from Roadway Centerline to: (Feet)			Average Daily Traffic	dBA @ 100 feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
North Shore Drive:											
West of Stanfield Cutoff	4,988	57.38	15	33	71	5,655	57.92	17	20	77	0.54
East of Stanfield Cutoff	7,245	59.00	20	42	91	7,245	59.00	20	42	91	0.00
Stanfield Cutoff:											
North of N. Shore Dr	131	32.42	0	1	2	131	32.42	0	1	2	0.00
N. Shore Dr. to Big Bear Blvd	5,906	58.11	17	37	80	6,573	58.58	18	40	86	0.47
South of Big Bear Blvd	2,363	49.36	4	10	21	2,363	49.36	4	10	21	0.00
Big Bear Boulevard:											
West of Stanfield Cutoff	21,525	63.08	41	88	188	21,792	63.13	41	88	190	0.05
East of Stanfield Cutoff	19,005	62.54	37	81	173	19,405	62.63	38	82	176	0.09

Traffic data obtained from the *Traffic Analysis* report (refer to Appendix 15.3, *Traffic Data*).
Note:
[1] = 100 feet is the assumed distance to the midpoint of a receptor rear yard.
- Noise level models computed for 2006 scenarios utilized existing 2002 roadway cross-section data.

In summary, based on the significance criteria established in Table 5.7-6, the proposed Moon Camp Project would not create significant vehicular related noise impacts along the analyzed roadway segments based on 2006 traffic conditions.

YEAR 2025 TRAFFIC CONDITIONS

Noise levels within the vicinity of the proposed project area were modeled for with and without project scenarios for 2025 traffic conditions to determine the location and extent of future vehicular generated noise conditions. Table 5.7-9, *Exterior Noise Exposure Adjacent to Nearby Roadways, 2025*, indicates the noise increase and/or decrease for the analyzed roadways within the County of San Bernardino and City of Big Bear Lake. According to Table 5.7-9, under the "2025 Without Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 33 to 64 dBA. The highest noise levels would occur on Big Bear Boulevard, west of Stanfield Cutoff. The lowest noise levels would occur along Stanfield Cutoff (north of North Shore Drive).

As stated in Table 5.7-9, under the "2025 With Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 33 to 64 dBA. Similar to the "2025 Without Project" scenario, the highest and lowest noise levels

would occur along Big Bear Boulevard (west of Stanfield Cutoff) and Stanfield Cutoff (north of North Shore Drive), respectively.

Table 5.7-9
Exterior Noise Exposure Adjacent to Nearby Roadways, 2025
(Based on Peak Month Traffic Volumes)

Roadway Segment	2025 Without Project					2025 With Project					Difference in dBA @100 Feet from Roadway
	Average Daily Traffic	dBA @ 100 Feet from Roadway Centerline[1]	Distance from Roadway Centerline to: (Feet)			Average Daily Traffic	dBA @ 100 feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
North Shore Drive:											
West of Stanfield Cutoff	5,890	58.10	17	37	79	6,557	58.57	18	40	85	0.47
East of Stanfield Cutoff	8,556	59.72	22	47	102	8,556	59.72	22	47	102	0.00
Stanfield Cutoff:											
North of N. Shore Dr	155	33.16	0	1	2	155	33.16	0	1	2	0.00
N. Shore Dr. to Big Bear Blvd	6,975	58.83	19	41	89	7,642	59.23	20	44	94	0.40
South of Big Bear Blvd	2,790	50.09	5	11	23	2,790	50.09	5	11	23	0.00
Big Bear Boulevard:											
West of Stanfield Cutoff	25,420	63.80	45	98	211	25,687	63.85	46	98	212	0.05
East of Stanfield Cutoff	22,444	63.26	42	90	194	22,844	63.34	42	91	196	0.08

Traffic data obtained from the *Traffic Analysis* report (refer to Appendix 15.3, *Traffic Data*).
Note:
[1] = 100 feet is the assumed distance to the midpoint of a receptor rear yard.
- Noise level models computed for 2006 scenarios utilized existing 2002 roadway cross-section data.

Table 5.7-9 also compares noise levels under the "2025 Without Project" scenario with the "2025 With Project" scenario. Based on the information cited in Table 5.7-9, all roadway segments comparatively analyzed would experience a noise increase of less than 1 dBA at 100 feet from the roadway centerline. Thus, noise impacts along all the roadway segments would be less than significant based on the significance criteria as stated within Table 5.7-6, *Significance of Changes in Cumulative Noise Exposure*.

In summary, based on the significance criteria established in Table 5.7-6, the proposed Moon Camp Project would not create significant vehicular related noise impacts along the analyzed roadway segments based on 2025 traffic conditions.

STATIONARY NOISE

5.7-3 *Implementation of the Moon Camp project would result in on-site noise associated with residential and parking lot activities and boat loading/unloading activities at the marina. Analysis has concluded that stationary source impacts would be reduced to less than significant levels*

with adherence to the County of San Bernardino General Plan policies relating to noise level standards and recommended mitigation measures.

Project implementation would result in stationary noise source impacts on-site.[6] These sources would include the typical residential noise sources and marina activities, including the adjacent parking lot. The potential impact from these sources were analyzed in terms of their proximity to the nearest off-site sensitive receptors.

Residential Areas

Development of the residential lots adjacent to residences located to the north (along Flicker Road), west (along Oriole Lane) and east (along North Shore Drive) would create new stationary noise typical of any residential development. Noise that is typical of residential areas includes such things as children playing, pet noise, amplified music, car repair, pool and spa equipment, woodworking and home repair. Noise typically associated with residential land uses does not produce noise levels greater than 60dBA. Noise from residential stationary sources would primarily occur during the "daytime" hours of 7:00 a.m. to 10:00 p.m. Furthermore, the residence would be required to comply with the noise standards set forth in the County General Plan. It is stated in the County's General Plan that exterior noise levels in residential property shall not exceed the basic noise standard of 55 dBA between the hours of 7:00 a.m. and 10:00 p.m. and shall not exceed 45 dBA between the hours of 10:00 p.m. and 7:00 a.m. (refer to Table 5.7-4). Thus, noise impacts from the residential uses are anticipated to be less than significant in this regard.

Marina Facilities

The project proposes to construct a marina on Big Bear Lake and an associated parking lot at the southwest corner of the site. Surface parking lots generate instantaneous maximum sound levels from tire squeals, trash pick-up, delivery trucks, lot sweeping, door slamming, back-up alarms, and engine start-ups (refer to Table 5.7-10, *Maximum Noise Levels Generated by Parking Lots*). Noise would primarily remain on-site and would be temporary (during peak-events). Parking lot noise can also be considered a "stationary" noise source and may occur after 10 p.m. Typical noise levels generated by parking areas are an estimated 70 dBA at 50 feet during peak events (this is an "instantaneous" or peak noise level). Parking lot noise would also be partially masked by background noise from adjacent roads and typical community noise sources. Since the nearest existing residential areas are located some 500 feet from the proposed marina parking lot, noise levels would not exceed 55 dBA during the daytime or 45 dBA at nighttime. Therefore, typical parking lot noise generated at the project site would be below both the daytime and nighttime noise standards at the nearest existing residential uses. Thus, impacts are considered to be less than significant in this regard.

[6] Stationary noise levels diminish at the rate of 6 dBA per doubling of distance, in comparison to mobile noise sources that diminish at the rate of 4.5 dBA per doubling.

Table 5.7-10
Maximum Noise Levels Generated by Parking Lots

Event	Maximum Noise Level (dBA AT 50 FEET)
Door Slam	60 to 70
Engine Start-Up	60 to 70
Car Pass-by	55 to 70
Source: Mestre Greve Associates.	

WATERCRAFT NOISE

5.7-4 *Implementation of the Moon Camp project would result in increased watercraft activities on Big Bear Lake. Analysis has concluded that watercraft noise impacts would be reduced to less than significant levels with adherence to Rules and Regulations established by the Big Bear Municipal Water District for Big Bear Lake.*

The Moon Camp Project proposes to construct approximately 100 boat docks (dependent upon demand) on the southwest corner of the project site, located on the north shore of Big Bear Lake. As stated in Section 5.2, *Recreation*, the 100 dock slips, if multiplied by the weekend use factor of 9 percent, would add approximately 9 boats per day to the daily average number of boats using the lake.

All boating activities would be responsible for complying with rules and regulations established by the Big Bear Municipal Water District. Boating operation requirements that include speed limits, mooring and launching restrictions, and muffler requirements would serve to reduce noise impacts generated by watercraft activities. As previously stated, the proposed project would add approximately 9 boats to the average daily use of the Lake. Not only is this considered a nominal increase in daily boating numbers, adherence to the Water District's rules and regulations, including Harbor and Navigational Code 654 (refer to page 5.7-11), would reduce noise impacts from watercrafts to a less than significant level. It is noted that during peak holiday and summer periods, the daily use of watercraft would significantly increase. However, compliance with the Water District's rules and regulations would reduce impacts to less than significant levels.

CUMULATIVE

5.7-5 *Implementation of the Moon Camp Project, combined with cumulative projects, would increase the ambient noise levels in the site vicinity. Impact analysis and mitigation of impacts are determined on a project-by-project basis.*

Implementation of the proposed project, combined with development of cumulative projects, would increase ambient noise levels in the site vicinity. This increase would be due to both vehicular traffic noise along local roadways and stationary noise

sources associated with development. The evaluation of noise impacts is typically determined on a project-by-project basis in order to focus mitigation on a particular noise source. As such, future development proposals within the County would require separate discretionary approval and CEQA assessment which would address potential noise impacts and identify appropriate attenuation measures where appropriate. As previously stated above, the proposed project, as well as cumulative development projects, would be individually required to reduce noise impacts to below County noise standards and demonstrate adherence to Development Code and General Plan requirements.

MITIGATION MEASURES

This section directly corresponds to the identified Impact Statements in the impacts subsection.

SHORT-TERM CONSTRUCTION NOISE AND VIBRATION IMPACTS

5.7-1a Construction activities shall be limited to the hours of 7:00 a.m. ~~and~~ to 7:00 p.m. Monday to Saturday and prohibited on Sundays and Federal Holidays.

5.7-1b All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the County Engineer.

5.7-1c Stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receptors, to the satisfaction of the County Engineer.

5.7-1d Stockpiling and staging areas shall be located as far as practical from noise sensitive receptors during construction activities, to the satisfaction of the County Engineer.

LONG-TERM NOISE IMPACTS

5.7-2 No mitigation measures are recommended.

STATIONARY NOISE

5.7-3 No mitigation measures are recommended.

WATERCRAFT

5.7-4 No mitigation measures are recommended.

CUMULATIVE

5.7-5 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

No unavoidable significant impacts related to noise have been identified following implementation of recommended mitigation measures and compliance with applicable requirements set forth by the County of San Bernardino and the Big Bear Municipal Water District.

5.8 BIOLOGICAL RESOURCES

The purpose of this Section is to identify existing biological resources on-site and in the vicinity, analyze potential Project-related impacts to these resources (including sensitive species) and recommend mitigation measures to reduce the significance of impacts that are identified. This Section describes the biological character of the site in terms of plants, wildlife, and wildlife habitats and analyzes the biological significance of the site in view of federal, state and local laws and policies. Information in this Section is based on the *Biological Resources Assessment* and Focused Surveys conducted by BonTerra Consulting (July 2003). The Biological Technical Report was prepared in accordance with accepted scientific and technical standards that are consistent with the requirements of the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG). This Section is also based on the Delineation of Jurisdictional Waters conducted by RBF Consulting (March 2002). Information is included in Appendix 15.6, *Biological Resources Information*.

EXISTING CONDITIONS

SURVEY METHODOLOGIES

This section describes the methodologies used to conduct the biological field surveys for the proposed Project. The results of these survey efforts are discussed in the *Existing Biological Resources* Section.

VEGETATION MAPPING AND GENERAL PLANT SURVEYS

A general reconnaissance field survey was conducted in December, 2001 to evaluate the potential of the Project site to support special status plants and animals and determine the need for further focused biological surveys. Additional field survey were conducted in May and June, 2002 to identify the vegetation types and plant species present on the Project site. All plant species observed were recorded in field notes. Plant species were identified in the field or collected for later identification. Plants were identified using taxonomic keys in Hickman, Munz, and Abrams. Taxonomy follows Hickman for scientific and common names. Plant community classifications follow Holland.

GENERAL WILDLIFE SURVEYS

Wildlife species observed during the general reconnaissance field survey were recorded in field notes. The Project site was also evaluated for its potential to support special status wildlife species that are known or are expected to occur in the region. Additionally, all wildlife species observed during focused surveys were recorded in field notes. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and logs. Birds were identified by visual and auditory recognition. Mammals were identified by visual recognition and by identifying diagnostic sign, including scat, footprints, scratch-outs, burrows, and trails. Taxonomy and nomenclature for wildlife generally follow American

Ornithologist's Union (AOU) for birds and Laudenslayer et al. for all other terrestrial vertebrates.

FOCUSED SURVEYS

Special Status Plant Species. Special status plant surveys were conducted in the spring and summer of 2002. All areas of the Project site containing native habitats potentially suitable for special status species were sampled using meandering transects. For a detailed discussion of survey methods refer to Appendix 15.6, *Biological Resources Information*.

Rubber Boa. Focused surveys for the rubber boa (*Charina bottae*) were conducted in the spring and summer of 2002. The survey effort consisted of three-drift fence and pitfall trapping periods, and five visual encounter surveys. For a detailed discussion of survey methods refer to Appendix 15.6, *Biological Resources Information*.

Southwestern Willow Flycatcher. Five focused surveys for the southwestern willow flycatcher (*Empidonax trailii*) were conducted during the spring and summer of 2002 per the guidelines of the U.S. Fish and Wildlife Service (USFWS). For a detailed discussion of survey methods refer to Appendix 15.6, *Biological Resources Information*.

California Spotted Owl. Focused surveys for the California spotted owl (*Strix occidentalis*) were conducted from April through June 2002. Six nighttime surveys and one roost location survey were performed on the Project site. Adjacent areas in the vicinity of the Project site were also surveyed to determine if off-site individuals or pairs were foraging on the Project site. For a detailed discussion of survey methods refer to Appendix 15.6, *Biological Resources Information*.

Bald Eagle. Focused surveys for the bald eagle (*Haliaeetus leucocephalus*) were conducted in February 2002. Four surveys were conducted to identify which trees on the Project site were used most frequently by the bald eagle for perching and/or roosting. In addition, a records search was conducted to characterize historic bald eagle wintering activity and tree use on the Project site and in the vicinity of Big Bear Lake. For a detailed discussion of survey methods refer to Appendix 15.6, *Biological Resources Information*.

Tree Surveys. A Forester Report was prepared in July 2001 to provide information on timber stand composition, condition, site quality, soil classification and characteristics, and impact of construction and development on the Project site. The report also provides guidelines for the protection of trees and prevention of insect infestation during the construction process. A complete copy of the report is included in Appendix 15.6, *Biological Resources Information*.

EXISTING BIOLOGICAL RESOURCES

This section describes the biological resources that either occur or potentially occur within the Project site or in the immediate vicinity. Vegetation types, wildlife populations and movement patterns, special status vegetation types, and special

status plant and wildlife species either known or potentially occurring are discussed below.

VEGETATION TYPES

Four vegetation types occur within the Project site. Exhibit 5.8-1, *Biological Resources*, illustrates their distribution and Table 5.8-1, *Existing Vegetation Types on the Project Site*, summarizes the extent of vegetation types present within the Project site. Each of the vegetation types observed during field surveys are described below.

Table 5.8-1
Existing Vegetation Types on the Project Site

Vegetation Type	Acreage
Jeffrey Pine Forest	54.91
Pebble Plain	0.69
Lake Shoreline	4.14
Developed	2.82
Total	**62.56**

Jeffrey Pine Forest. Jeffrey pine forest occurs on 54.91 acres of the eastern half of the Project site. This area is dominated by Jeffrey pine (*Pinus jeffreyi*) with white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occurring at lower densities. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), Greg's ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches. Jeffrey pine forest occurs at elevations ranging from 3,200 to 7,800 feet above msl in southern California.

Portions of the Jeffrey pine forest on the Project site provide suitable habitat for listed Threatened and Endangered plant species. In particular, approximately 17.38 acres containing few trees and fairly open canopy where Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*) occurs are suitable habitat for the federally-listed Threatened ash-gray Indian paintbrush, CNPS 1B listed Parish's rock-cress (*Arabis parishii*), and CNPS 1B listed silver-haired ivesia. For this reason, open Jeffrey pine forest is shown as a separate vegetation type on Exhibit 5.8-1. Additionally, areas within the Jeffrey pine forest where herbaceous cover is dominated by Wright's matting buckwheat are identified on Exhibit 5.8-1.

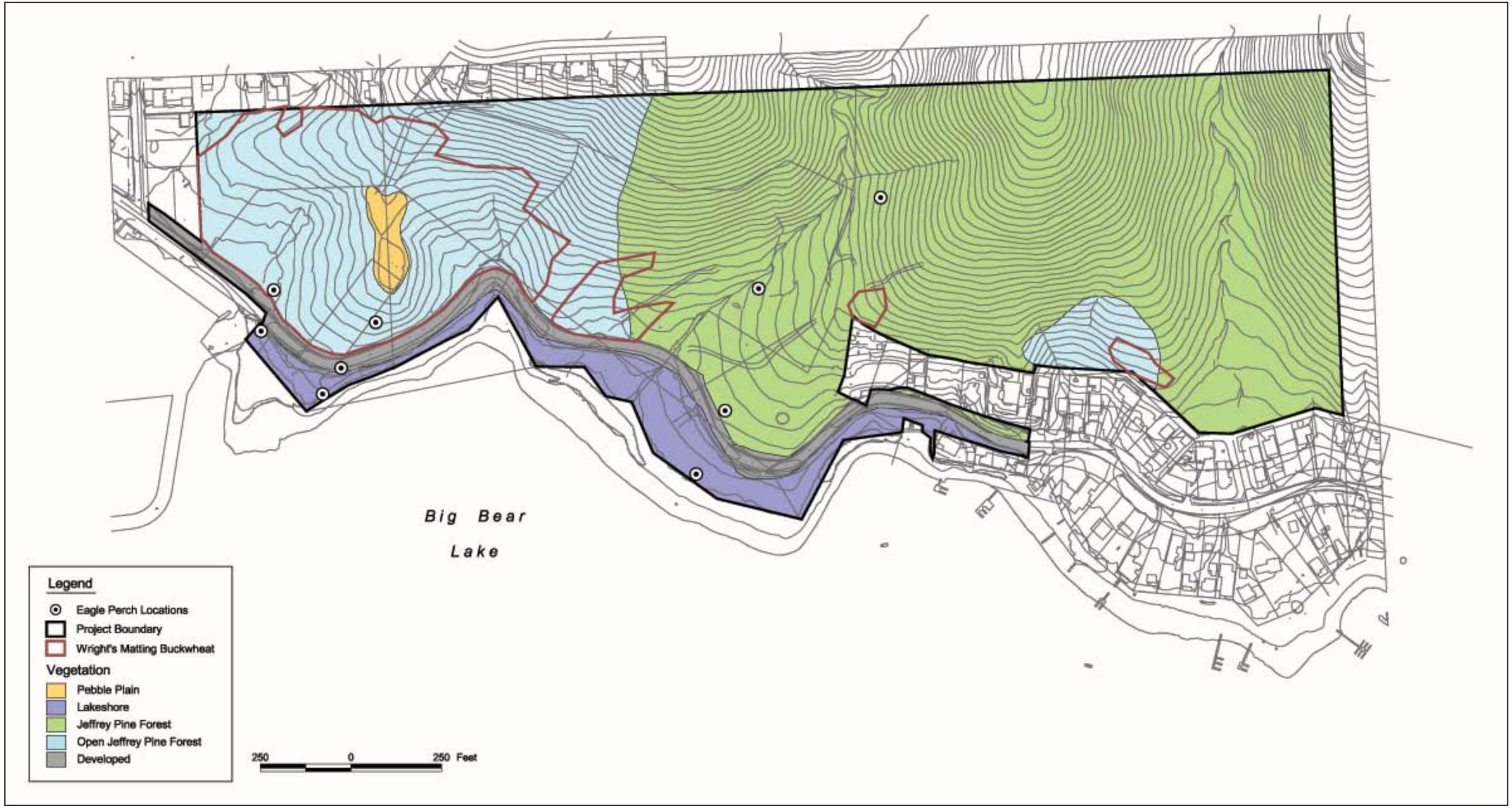
Within the Jeffrey pine forest onsite, tree resources consist of unevenly aged, pine stands composed of approximately 85 percent Jeffrey pine, eight percent western juniper, six percent singleleaf pinyon pine, and less than 1 percent of scattered white fir and black oak. Site quality has been rated medium Class 4 according to the criteria in the Forester's Handbook. The medium Class 4 rating describes the site as having 40 to 59 percent tree cover (medium cover) with small trees of conifer crown diameter 12 to 24 feet, and trunk diameter at breast height (dbh) of 11 to 24 inches. A total of 2,772 trees six inches in diameter or larger was calculated from aerial photographs. These trees grow on soils classified as 2/3 Morical-Hecker in the southern portion and 1/3 Pacifico-Wapi in the northern portion. Morical-Hecker soils are very deep with an effective rooting depth of 40 inches, and have high moisture retention capability, moderate erosion hazard, and a good timber productivity rating. Pacifico-Wapi soils are shallow, with a 10-20 inch effective root depth, low moisture holding capacity, high erosion hazard, and a poor capacity for tree seedling survival and growth without supplemental irrigation.

The overall condition of trees on the property is classified as fair. Scattered groups of large Jeffrey pine and juniper are host to moderate amounts of dwarf mistletoe (*Phorodendron* sp.) and several saplings and small pole pines under these trees have become heavily infested. Although a large number of dead trees were observed on the site, only one tree was observed to have been recently killed by bark beetles. Given the current drought situation and beetle population, there is a high potential for additional tree mortality from insect attack.

Pebble Plain. Pebble plain occurs on 0.69 acre of the Project site north of State Route 38. It appears as a distinct open patch within open Jeffrey pine forest in the western portion of the Project site. The substrate in this area consists of clay soil mixed with quartzite pebbles and gravel that are continually pushed to the surface through frost action. This substrate supports a high floristic diversity consisting of small cushion-forming plants, tiny annuals, grasses, and succulents that are well spaced, low growing, and sun tolerant. Several rare and special status plants are associated with pebble plain habitat, including federally-listed Threatened and Endangered species.

Portions of the pebble plain habitat on the Project site have been subjected to disturbance by off-road vehicles. The Pebble Plain Habitat Management Guide and Action Plan was developed by the San Bernardino National Forest to provide management direction for long-term conservation of pebble plains and the rare plants associated with them. Closure of unauthorized vehicle routes through pebble plain habitat, signage, increased patrol, habitat acquisition, removal of non-native grasses, and public education are actions being taken to protect and enhance the habitat.

Lake Shoreline. Approximately 4.14 acres of the southern boundary of the Project site is formed by the shore of Big Bear Lake. Plant species along the shore itself consisted primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Several seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*)



Source: BonTerra Consulting, July 2003.

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also occur in this vegetation type. Small patches of meadow transitioning into upland grassland occur along the lakeshore south of State Route 38. The extent of the meadows could not be determined or mapped in 2002 due to dry conditions. The lake was well below its maximum level in 2001 to 2002 due to acute drought conditions. Vegetation is patchy above the high-water level where small areas of Jeffrey pine forest are interspersed among open meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laviegata*).

Developed. Developed areas occur on 2.82 acres along the shoreline of the site. Plants found in this vegetation type consist of native and non-native ornamental species which offer very little habitat value for native wildlife species. Paved areas such as State Route 38 and existing turnouts are included in this vegetation type.

Jurisdictional Waters. A Delineation of Jurisdictional Waters was prepared in order to delineate U.S. Army Corps of Engineers' and California Department of Fish and Game's (CDFG) jurisdictional authority for unnamed drainages located within the Project site.

Prior to visiting the site, RBF conducted a review of USGS topographic maps (Quadrangle *Fawnskin, California*, dated 1996) and aerial photographs to identify areas that *may* fall under an agency's jurisdiction. Corps jurisdictional wetlands are delineated using the methods outlined in the Corps of Engineers *Wetland Delineation Manual* (1987) based on hydrologic and edaphic features of the site, and on the vegetation composition of the site. Non-wetland waters of the U.S. are delineated based on the limits of the ordinary high water mark (OHWM) as determined by erosion, the deposition of vegetation or debris, and changes in the vegetation. Generally, California Department of Fish and Game (CDFG) takes jurisdiction to the bank of the stream/channels or to the limit of the adjacent riparian vegetation, whichever is greater. Analysis of the Project site consists of field surveys and verification of current conditions conducted in March 2002.

Vegetation within the drainages of the Project site consisted of upland habitat, dominated by Jeffery pines. Soils within the drainage were documented to be silty-sand (large grain). Soil samples taken on-site were generally dry and lacked characteristics of hydric soils (i.e., odor, streaking, mottling). ~~No flow within the on site drainages was observed during the March 15, 2002 field visit. However, evidence of an OHWM was observed within the drainages, primarily indicated by sediment deposits.~~ No flow within the on-site drainages was observed during the March 15, 2002 field visit. However, evidence of an OHWM was observed within the drainages, primarily indicated by sediment deposits. It should also be noted that Big Bear Lake adjoins the project site to the south. Based on discussions with the Big Bear Municipal Water District, the current water level of Big Bear Lake (as of June 28, 2004) is 6,727.8-feet above mean sea level (msl). The high water mark is reported to be 6,743.2 feet above msl.

There are three key agencies that regulate activities within inland streams, wetlands and riparian areas in California. The U.S. Army Corps of Engineers (Corps) Regulatory Program regulates activities pursuant to Section 404 of the Federal Clean Water Act, and Section 10 of the Rivers and Harbors Act. The California Department of Fish and Game (CDFG) regulates activities under the Fish and Game Code

Section 1600-1616, and the Regional Water Quality Control Board (RWQCB) under Section 401 of the Federal Clean Water Act and the California Porter-Cologne Act.

Waters of the U.S. (Wetland) Determination. The Corps and the EPA jointly define wetlands as: *Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas* (33 CFR Section 328.3(b)).

In order to be considered a wetland, an area must exhibit all three of the wetland parameters (i.e., vegetation, soil, and hydrology) per the evaluation criteria in the Wetland Delineation Manual. Based on the results of the field investigations, it was determined that all three parameters were not present within the drainages (hydric soils nor riparian vegetation were present). As a result, RBF identified no Corps wetlands on the Project site.

Waters of the U.S. (Non-Wetland) Determination. The unnamed drainages within the Project site exhibited evidence of flow (i.e., sediment/silt deposition) sufficient to document the OHWM (i.e., channel bed and bank lines), thus meeting the criteria for jurisdictional waters. Refer to Exhibit 5.8-2, *Jurisdictional Map*, for an illustration of jurisdictional boundaries.

Based on the results of the field observations and data collection, 0.15-acre of Corps jurisdictional "waters of the U.S." were identified within the Project site. ~~The drainages are ephemeral.~~ In addition to on-site ephemeral drainages, the Corps considers Big Bear Lake jurisdictional. The Corps' jurisdictional limits are delineated at the high water line, which is reported to be at 6,743.2-foot elevation (and below).

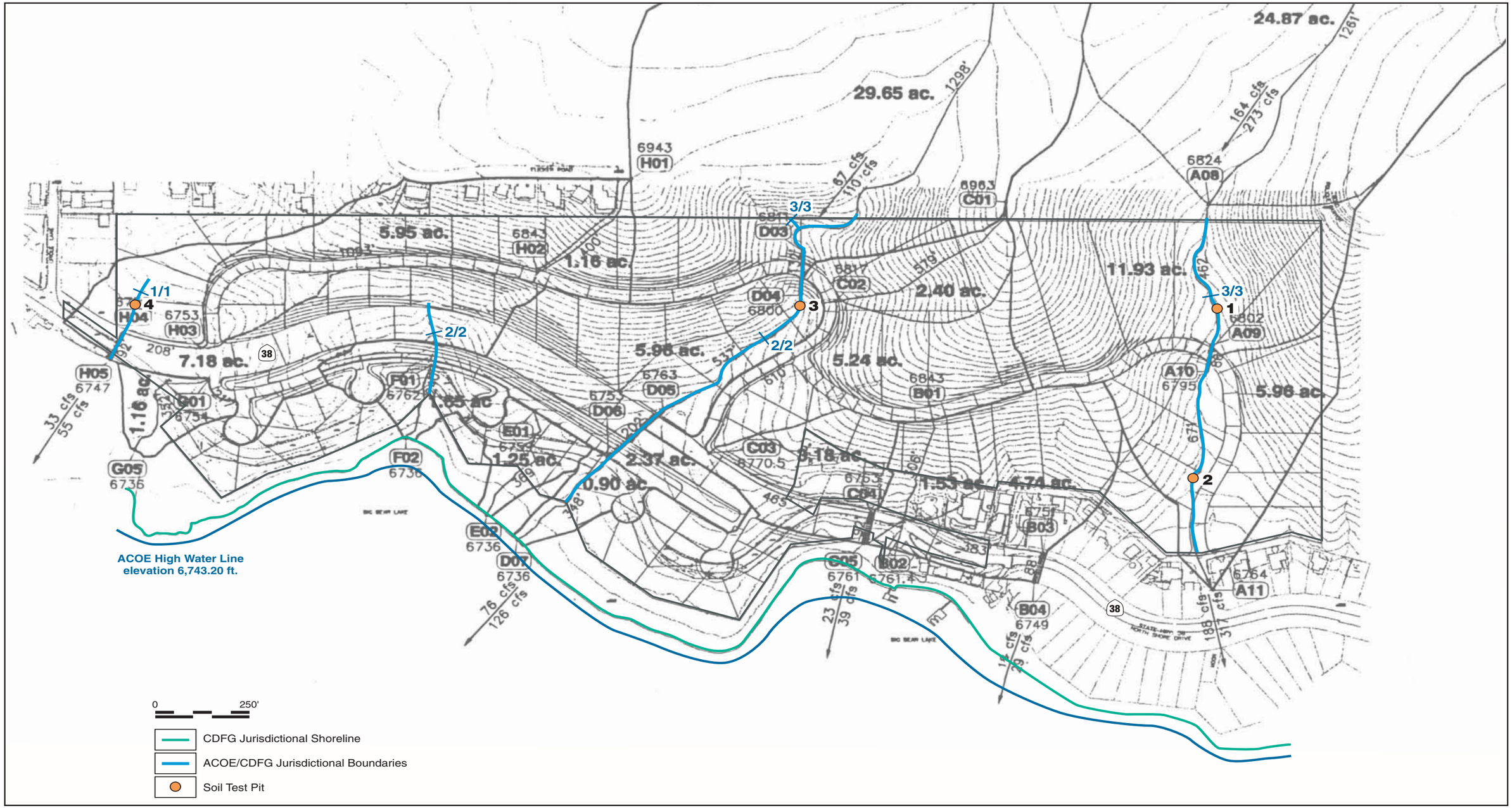
California Department of Fish and Game (1602) Jurisdiction. Based on the results of the field observations and data collection, 0.15-acre of CDFG jurisdictional streambed~~waters~~ was~~were~~ identified within the Project site. As with the Corps, Big Bear Lake would be considered jurisdictional by the CDFG, including the approximate 4.14-acre lake shoreline.

WILDLIFE INVENTORY

WILDLIFE

Amphibians

Amphibians require moisture for at least a portion of their life cycle and many require standing or flowing water for reproduction. Although more typical in mesic conditions, there are a number of amphibians species that occur or potentially occur even in the more xeric habitats. Terrestrial species may or may not require standing water for reproduction. These species are able to survive in dry areas by remaining beneath the soil in burrows, under logs or leaf litter, and emerging only when temperatures are low and humidity is high. Many of these species' habitats are associated with water, and they emerge to breed once the rainy season begins. Soil moisture conditions can remain high throughout the year within some habitat types, depending on factors such as amount of vegetation cover, elevation, and slope aspect.



Source: Delineation of Jurisdictional Waters, Moon Camp TT #16136, prepared by RBF, July 2004.

RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION

12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Jurisdictional Map

Exhibit 5.8-2

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No amphibians were detected during the field surveys; however, leaf litter and rotting logs on the Project site provide potential habitat for the Pacific slender salamander (*Batrachoseps pacificus*). The western toad (*Bufo boreas*) would also be expected to occur on the Project site.

Reptiles

Reptilian diversity and abundance typically vary with vegetation type and character. Many species prefer only one or two vegetation types; however, most will forage in a variety of habitats. Most species occurring in open areas use rodent burrows for cover, and protection from predators and extreme weather conditions. Those species discussed below, which were not observed during surveys, are expected to occur based on the presence of suitable habitat (substrate and vegetation) within the Project site.

Reptile species observed during the surveys include the western fence lizard (*Scleroporus occidentalis*), sagebrush lizard (*Sceloperus graciosus*), western skink (*Eumeces skiltonianus*), southern alligator lizard (*Elgaria multicarinatus*), and southern Pacific rattlesnake (*Crotalus viridis helleri*). Common reptile species expected to occur on the Project site include the side-blotched lizard (*Uta stansburiana*) and gopher snake (*Pituophis melanoleucus*).

Birds

Montane conifer forests in the San Bernardino Mountains can experience severe winter conditions during the winter months. Nonetheless, several resident bird species are expected to occur on the Project site, using the habitats throughout the year. Other species are present only during certain seasons. For example, the Anna's hummingbird (*Calypte anna*), which was observed on the Project site, is expected to occur during the breeding season (i.e., spring and summer) and will then migrate south for the winter.

Common resident bird species observed on the Project site during surveys include the following:

- wild turkey (*Meleagris gallopavo*)
- band-tailed pigeon (*Columba fasciata*), great-horned owl (*Bubo virginianus*)
- acorn woodpecker (*Melanerpes formicivorus*)
- red-breasted sapsucker (*Sphyrapicus ruber*)
- hairy woodpecker (*Picoides villosus*)
- Nuttall's woodpecker (*Picoides nuttallii*)
- northern flicker (*Colaptes auratus*)
- black phoebe (*Sayornis nigricans*)
- Stellar's jay (*Cyanocitta stelleri*)
- common raven (*Corvus corax*)
- mountain chickadee (*Poecile gambeli*)
- bushtit (*Psaltriparus minimus*)
- red-breasted nuthatch (*Sitta canadensis*)
- white-breasted nuthatch (*Sitta carolinensis*)
- house wren (*Troglodytes aedon*)

- western bluebird (*Sialia mexicana*)
- northern mockingbird (*Mimus polyglottos*)
- European starling (*Sturnus vulgaris*)
- spotted towhee (*Pipilo maculatus*)
- dark-eyed junco (*Junco hyemalis*)
- Brewer's blackbird (*Euphagus cyanocephalus*)
- brown-headed cowbird (*Molothrus ater*)
- house finch (*Carpodacus mexicanus*)
- red crossbill (*Loxia curvirostra*)

Other resident species expected to occur on the Project site include the following:

- pied-billed grebe (*Podilymbus podiceps*)
- great blue heron (*Ardea herodias*)
- mallard (*Anas platarynchos*)
- gadwall (*anas strepera*)
- ruddy duck (*Oxyura jamaicensis*)
- red shouldered hawk (*Buteo lineatus*)
- red-tailed hawk (*Buteo jamaicensis*)
- American kestrel (*Falco sparverius*)
- American coot (*Fulica americana*)
- killdeer (*Charadrius vociferus*)
- rock dove (*Columbia livia*)
- mourning dove (*Zenaida macroura*)
- pygmy nuthatch (*Sitta pygmaea*)
- brown creeper (*Certhia americana*)
- Bewick's wren (*Thryomanes bewickii*)
- American robin (*Turdus migratorius*)
- pine siskin (*Carduelis pinus*)

Montane conifer habitats in the San Bernardino Mountains typically experience mild, warm summer months. Given the mild climate and abundance of nesting habitat, several bird species are expected to occur on the Project site during the breeding season. Common breeding bird species observed on the Project site during surveys include Ana's hummingbird and western wood-peewee (*Contopus sordidulus*). Other common breeding species expected to occur on the Project site include the spotted sandpiper (*Actitis macularia*), violet green swallow (*Tachycineta thalassina*), and yellow-rumped warbler (*Dendroica coronata*).

Mammals

The ornate shrew (*Sorex ornatus*), brush mouse (*Peromyscus boylii*), western grey squirrel (*Sciurus griseus*), California ground squirrel (*Spermophilus beecheyi*), dusky-footed woodrat (*Neotoma fuscipes*), California vole (*Microtus californicus*), and coyote (*Canis latrans*) were observed on the Project site during the surveys. Other mammals expected to occur on the Project site include the following:

- dusky shrew (*Sorex monticolus*)
- broad-footed mole (*Scapanus latimanus*)
- Merriam's chipmunk (*Tamias merriami*)

- lodgepole chipmunk (*Tamias speciosus*)
- golden-mantled ground squirrel (*Spermophilus lateralis*)
- deer mouse (*Peromyscus maniculatus*)
- western harvest mouse (*Reithrodontomys megalotis*)
- Botta's pocket gopher (*Thomomys bottae*)
- house mouse (*Mus musculus*)

Easily detectable mammals that are expected to occur on the site include the following:

- Virginia opossum (*Didelphis virginiana*)
- porcupine (*Erethizon dorsatum*)
- long-tailed weasel (*Mustela frenata*)
- striped skunk (*Mephitis mephitis*)
- raccoon (*Procyon lotor*)
- mule deer (*Odocoileus hemionus*)
- bobcat (*Felis rufus*)

Larger mammals that may occur on the Project site include the gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), badger (*Taxidea taxus*), and mountain lion (*Felis concolor*).

Bats occur throughout most of southern California and may use any portion of the Project site as foraging habitat. Most of the bats that could potentially occur onsite are inactive during the winter and either hibernate or migrate, depending on the species. The California myotis (*Myotis californicus*) and big brown bat (*Eptesicus fuscus*) may occur on the Project site. Gaps in peeling bark and hollow snags or limbs provide potential roosting and maternal colony opportunities for these and other bat species.

WILDLIFE MOVEMENT

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (e.g., juvenile animals from natal areas, individuals extending range distributions); (2) seasonal migration; and (3) movements related to home range activities (e.g., foraging for food or water, defending territories, searching for mates, accessing breeding areas, or securing cover). A number of terms have been used in various wildlife movement studies, such as "travel route", "wildlife corridor", and "wildlife crossing" to refer to areas in which wildlife move from one area to another.

To clarify the meaning of these terms and to facilitate the discussion on wildlife movement in this analysis, these terms are briefly defined as follows:

- *Travel Route* – a landscape feature such as a ridgeline, drainage, canyon, or riparian strip within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g., water, food, cover, den sites).

- *Wildlife Corridor* – a piece of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another.

- *Wildlife Crossing* – a small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement.

As defined above, the Project site does not contain wildlife crossings or corridors. Nonetheless, the Project site could be used as a travel route connecting forest habitat to the north with Big Bear Lake. However, direct connection to open space areas north and east of the Project site are obstructed by State Route 38. The importance of this travel route may be diminished by the vehicle traffic hazard associated with crossing State Route 38 as well as the availability of similar habitat immediately adjacent to the east of the Project site.

SPECIAL STATUS BIOLOGICAL RESOURCES

The following discussion addresses special status biological resources observed, reported, or having the potential to occur on the Project site. These resources include plant and wildlife species that have been afforded special status and/or recognition by federal and state resource agencies, as well as the California Native Plant Society (CNPS). In general, the principal reason an individual taxon (i.e., species, subspecies, or variety) is given such recognition is the documented or perceived decline or limitations of its population size, geographic range, and/or distribution resulting in most cases from habitat loss. Table 5.8-2, *Special Status Plant Species*, and Table 5.8-3, *Special Status Wildlife Species*, provide a summary of special status plant and wildlife species known to occur in the Project region including information on the status, potential for occurrence, and definitions for the various status designations. In addition, special status biological resources include vegetation types and habitats that are either unique, of relatively limited distribution in the region, or of particularly high wildlife value. Federal, state, and local government conservation programs have defined these resources. Sources used to determine the special status of biological resources are as follows:

- Plants – *Electronic Inventory of Rare and Endangered Vascular Plants of California.* (California Native Plant Society [CNPS] [2000]). California Natural Diversity Database (CNDDB) *List of Special Plants* (CDFG [1998]). Various Federal Register notices from the USFWS regarding listing status of plant species.

- Wildlife – California Wildlife Habitat Relationships Database System (CDFG 1991); CNDDB (CDFG 2000), Various Federal Register notices from the USFWS regarding listing status of wildlife species.

- Habitats – CNDDB (CDFG 2000).

Table 5.8-2
Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Abronia nana ssp. *covillei* Coville's dwarf abronia	—	—	4	Low; marginally suitable habitat
Allium parishii Parish's onion	—	—	4	Low; above known elevation range
Antennaria marginata White-margined everlasting	—	—	2	None; outside of known geographic range (only local occurrences in Barton Flats area)
Arabis breweri var. *pecuniaria* San Bernardino rock-cress	—	—	1B	None; far below known elevation range
Arabis dispar Pinyon rock-cress	—	—	2	None; outside known geographic range (only occurs on desert-facing slopes)
Arabis parishii Parish's rock-cress	—	—	1B	Observed
Arabis shockleyi Shockley's rock-cress	—	—	2	None; outside known geographic range (only local occurrences on desert-facing slopes)
Arenaria lanuginosa ssp. *saxosa* Rock sandwort	—	—	2	Moderate; marginally suitable habitat
Arenaria ursina Big Bear Valley sandwort	FT	—	1B	High; suitable habitat
Astragalus albens Cushenbury milk-vetch	FE	—	1B	None; no suitable habitat (carbonate soils)
Astragalus bicristatus Crested milk-vetch	—	—	4	High; suitable habitat
Astragalus lentiginosus var. *sierrae* Big Bear Valley milk-vetch	—	—	1B	High; suitable habitat
Astragalus leucolobus Big Bear Valley woollypod	—	—	1B	Observed
Atriplex parishii Parish's smallscale	—	—	1B	None; no suitable habitat (alkali sink)
Berberis fremontii Fremont's barberry	—	—	3	None; no suitable habitat (presumed extinct in Cushionbury area)
Botrychium crenulatum Scalloped moonwort	—	—	2	None; no suitable habitat (marshes, bogs)
Calochortus palmeri var. *palmeri* Palmer's mariposa lily	—	—	1B	Moderate; marginally suitable habitat
Calochortus plummerae Plummer's mariposa lily	—	—	1B	None; above known elevation range
Castilleja cinerea Ash-gray Indian paintbrush	FT	—	1B	Observed
Castilleja lasiorhyncha San Bernardino Mountain owl's clover	—	—	1B	High; suitable habitat
Dryopteris filix-mas Male fern	—	—	2	Low; local rarity; outside known range

Table 5.8-2 – Continued
Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Dudleya abramsii ssp. *affinis* San Bernardino Mountains dudleya	—	—	1B	Moderate; marginally suitable habitat
Erigeron breweri var. *jacinteus* San Jacinto Mountains daisy	—	—	4	None; below known elevation range
Erigeron parishii Parish's daisy	FT	—	1B	None; no suitable habitat (carbonate soils)
Erigeron unicaulis Limestone daisy	—	—	2	None; outside known geographic range (local reports erroneous)
Eriogonum foliosum Leafy buckwheat	—	—	1B	High; suitable habitat
Eriogonum kennedyi var. *austromontanum* Southern mountain buckwheat	FT	—	1B	Low; suitable habitat (see text)
Eriogonum ovalifolium var. *vineum* Cushenbury buckwheat	FE	—	1B	None; no suitable habitat (carbonate soils)
Eriophyllum lanatum var. obovatum Southern Sierra wooly sunflower	—	—	4	Low; margin of known geographic range
Fimbristylis thermalis Hot springs fimbristylis	—	—	4	None; no suitable habitat (alkaline meadows, hot springs)
Galium jepsonii Jepson's bedstraw	—	—	4	High; suitable habitat
Galium johnsttonii Johnston's bedstraw	—	—	4	High; suitable habitat
Gentiana fremontii Moss gentian	—	—	2	None; below known elevation range
Gilia leptantha ssp. *leptantha* San Bernardino Mountains gilia	—	—	1B	Low (see text)
Helianthus nuttalli ssp. *parishii* Los Angeles sunflower	—	—	1A	None; presumed extinct, above known elevation range
Heuchura hirsutissima Shaggy-haired alum root	—	—	1B	Low; limited suitable habitat
Heuchura parishii Parish's alumroot	—	—	1B	Low; limited suitable habitat
Horkelia wilderae Barton Flats horkelia	—	—	1B	None; outside known geographic range, endemic to Barton Flats area
Hulsea vestita ssp. *parryi* Parry's sunflower	—	—	4	None; outside known geographic range (only occurs on desert-facing slopes)
Hulsea vestita ssp. *pygmaea* Pygmy hulsea	—	—	1B	None; below elevation range
Ivesia argyrocoma Silver-haired ivesia	—	—	1B	Observed
Juncus duranii Duran's rush	—	—	4	High; suitable habitat
Lesquerella kingii var. *bernardina* San Bernardino Mountains bladderpod	FE	—	1B	None; no suitable habitat (carbonate soils)

Table 5.8-2 – Continued
Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Lewisia brachycalyx Short-sepaled lewisia	—	—	2	Moderate; limited suitable habitat
Lilium humbodtii ssp. *ocellatum* *Ocellated Humboldt lily*	—	—	4	None; above known elevation range
Lillium parryi Lemon lily	—	—	1B	Low; limited suitable habitat
Linanthus killipii Baldwin Lake linanthus	—	—	1B	High; suitable habitat
Malaxiis monohyllos ssp. *brachypoda* Adder's mouth	—	—	2	None; below known elevation range
Mimulus exiguus San Bernardino Mountain monkeyflower	—	—	1B	High; suitable habitat
Mimulus purpureus var. *purpureus* Purple monkeyflower	—	—	2	High; suitable habitat
Monardella macrantha ssp. *hallii* Hall's monardella	—	—	1B	None; outside known geographic range
Navarretia peninsularis Baja navarretia	—	—	1B	Low; limited suitable habitat
Oxytheca caryophylloides Chickweed oxytheca	—	—	4	High; suitable habitat
Oxytheca parishii var. *cienegensis* Cienega seca oxytheca	—	—	1B	None; outside known geographic range
Oxytheca parishii var. *goodmaniana* Cushenbury oxytheca	FE	—	1B	None; no suitable habitat (carbonate soils)
Oxytropis oreophila Mountain oxytrope	—	—	2	None; below known elevation range
Perideridia parishii ssp. *parishii* Parish's yampah	—	—	2	High; suitable habitat
Phacelia exilis Transverse Range phacelia	—	—	4	High; suitable habitat
Phacelia mohavensis Mojave phacelia	—	—	4	High; suitable habitat
Phlox dolichantha Bear Valley phlox	—	—	1B	High; suitable habitat
Poa atropurpurea San Bernardino bluegrass	FE	—	1B	High; suitable habitat
Poliomintha incana Frosted mint	—	—	1A	None; no suitable habitat (dunes and sandy flats), above known elevation range
Polystichum kruckebergii Krukeberg's sword fern	—	—	4	None; limited suitable habitat, outside known geographic distribution
Populus angustifolia Narrow-leaved cottonwood	—	—	2	None; outside known geographic range

Table 5.8-2 – Continued
Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Pyrrocoma uniflora ssp. *gossypina* Bear Valley pyrrocoma	—	—	1B	High; suitable habitat
Rupertia rigida Parish's rupertia	—	—	4	High; suitable habitat
Scutellaria bolanderi ssp. *austromntanum* Southern mountain skullcap	—	—	1B	None, outside known geographic range, above known elevation range
Sedum niveum Davidson's stonecrop	—	—	4	None; no suitable habitat (rock ledges and cliffs)
Selaginella asprella Bluish spike-moss	—	—	4	Low; limited suitable habitat
Senecio bernardinus San Bernardino butterweed	—	—	1B	Low; limited suitable habitat
Senecio ionophyllus Tehachapi ragwort	—	—	4	Low; limited suitable habitat
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	C	R	1B	Low; limited suitable habitat
Sidalcea pedata Bird's foot checkerbloom	FE	SE	1B	Low to moderate (see text); suitable habitat
Sphenopholis obtusata Prairie wedge grass	—	—	2	High; suitable habitat
Streptanthus bernardinus Laguna Mountains jewelflower	—	—	4	High; suitable habitat
Streptanthus campestris Southern jewelflower	—	—	1B	High; suitable habitat
Swertia neglecta Pine green-gentian	—	—	4	High; suitable habitat
Taraxacum californicum California dandelion	FE	—	1B	Low to moderate (see text); suitable habitat
Thelypodium stenopetalum Slender-petaled thelypodium	FE	—	1B	None; no suitable habitat (alkaline meadows)
Trichostema micranthum Small-flowered bluecurls	—	—	4	High; suitable habitat
Viola pinetorum ssp. *grisea* Grey-leaved violet	—	—	1B	Low; outside known geographic range

STATUS DEFINITIONS

USFWS

FE: Species designated as endangered under the federal Endangered Species Act. Endangered = "any species in danger of extinction throughout all or a significant portion of its range."

FT: Species designated as threatened under the Federal Endangered Species Act. Threatened = "species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

FPE: Proposed for federal listing as Endangered.

FPT: Proposed for federal listing as Threatened.

C: Candidate for federal listing as Threatened or Endangered.

SOC: Species of Concern

CDFG

ST: Threatened = "a species that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this Act" (California Endangered Species Act).

SE: Endangered = "a species is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes."

R: Rare

CNPS

1A Plants Presumed Extinct in California

1B Plants Rare, Threatened, or Endangered in California and Elsewhere

2 Plants Rare, Threatened, or Endangered in California But More Common Elsewhere

3 Plants About Which We Need More Information- A Review List

4 Plants of Limited Distribution - A Watch List

Table 5.8-3
Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status[1]		Likelihood for Occurrence
	USFWS	CDFG	
Invertebrates			
Euchloe hyantis ssp. *andrewsi* Andrews' marble butterfly	SOC	—	Low; above known elevation range, limited suitable habitat
Amphibians			
Ensatina escholtzii croceater Yellow-blotched salamander	SOC	SSC	Low; limited marginally suitable habitat
Ensatina escholtzii klauberi Large-blotched salamander	SOC	SSC	None; above known elevation range, outside known geographic range
Rana muscosa Mountain yellow-legged frog	FPE	SSC	None; no suitable habitat
Scaphiopus hamondii Western spadefoot toad	SOC	SSC	None; above known elevation range
Taricha torosa torosa Coast range newt	SOC	SSC	None; no suitable habitat, above known elevation range
Reptiles			
Anniella pulchra pulchra Silvery legless lizard	SOC	SSC	Low; above known elevation range
Charina bottae umbricata Southern rubber boa	SOC	ST	Low; limited suitable habitat
Cnemidophorus tigris multiscutatus Coastal western whiptail	SOC	—	Moderate; suitable habitat
Coleonyx variegatus abbotti San Diego banded gecko	SOC	—	None; above known elevation range, no suitable habitat
Diadophis punctatus modestus San Bernardino ringneck snake	SOC	—	Low; limited suitable habitat
Lampropeltis zonata parvirubra San Bernardino Mountain kingsnake	SOC	—	Moderate; marginally suitable habitat
Lichanura trivirgata roseofusca Coastal rosy boa	SOC	—	None; above known elevation range
Phrynosoma coronatum ssp. *blainvillei* San Diego coast horned lizard	SOC	SSC/P	None; above known elevation, lack of suitable habitat
Sceloporus graciosus vendenbergianus Southern sagebrush lizard	SOC	—	Observed

Table 5.8-3 – Continued
Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status[1]		Likelihood for Occurrence
	USFWS	CDFG	
Salvadora hexalepis virgultea Coast patch-nosed snake	SOC	SSC	None; lack of suitable habitat, above known elevation
Thamnophis hammondii hammondii Two-striped garter snake	—	SSC	None; no suitable habitat
Birds			
Accipiter cooperii Cooper's hawk	—	SSC	Nesting: Moderate Foraging: High
Accipiter gentilis Northern goshawk	SOC	SSC	Nesting: None Foraging: Moderate
Accipiter striatus Sharp-shinned hawk	—	SSC	Nesting: None Foraging: High in winter
Aimophila ruficeps canescens Southern California rufous-crowned sparrow	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Amphispiza belli belli Bell's sage sparrow	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Aquila chrysaetos Golden eagle	—	SSC	Nesting: None Foraging: High
Asio otus Long-eared owl	—	SSC	Nesting: Low Foraging: Moderate
Buteo regalis Ferruginous hawk	SOC	SSC	Nesting: None Foraging: Low in winter
Circus cyaneus Northern harrier	—	SSC	Nesting: None Foraging: Low
Cypseloides niger Black swift	—	SSC	Nesting: None Foraging: Moderate
Dendroica petechia Yellow warbler	—	SSC	Nesting: None Foraging: Moderate
Elanus leucereus White-tailed kite	—	FP	Nesting: Low Foraging: Low
Empidonax traillii extimus Southwestern willow flycatcher	FE	SE	Nesting: Low Foraging: Moderate; rare migrant
Eremophila alpestris actia California horned lark	—	SSC	Nesting: None Foraging: None; above known elevation range

Table 5.8-3 – Continued
Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status[1]		Likelihood for Occurrence
	USFWS	CDFG	
Falco columbaris Merlin	—	SSC	Nesting: None Foraging: Low
Falco mexicanus Prairie falcon	—	SSC	Nesting: None Foraging: Low
Falco peregrinus anatum American Peregrine falcon	—	FE	Nesting: None Foraging : Low
Haliaeetus leucocephalus Bald eagle	FE	SE	Nesting: None Foraging: Observed in winter
Lanius ludovicianus Loggerhead shrike	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Piranga flava Hepatic tanager	—	SSC	Nesting: Low Foraging: Low
Progne subis Purple martin	—	SSC	Nesting: Low Foraging: Low; local rarity
Strix occidentalis occidentalis California spotted owl	SOC	SSC	Nesting: Low/None observed during focused surveys Foraging: High/Observed in close proximity to Project site
Vireo vicinior Gray vireo	—	SSC	Nesting: None Foraging: Low
Mammals			
Antrozus pallidus Pallid bat	—	SSC	Roosting: Low Foraging: Low
Euderma maculatum Spotted bat	SOC	SSC	Roosting: None Foraging: Moderate
Eumops perotis californicus California mastiff bat	SOC	SSC	Roosting: None Foraging: Low
Glaucomys sabrinus californicus San Bernardino Mountain flying squirrel	SOC	SSC	Breeding: Low Foraging: High
Myotis ciliolabrum Small-footed myotis	SOC	—	Roosting: Low Foraging: High
Myotis evotis Long-eared myotis	SOC	—	Roosting: High Foraging: High
Myotis lucifugus Occult little brown bat	SOC	SSC	Roosting: High Foraging: High

Table 5.8-3 – Continued
Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status[1]		Likelihood for Occurrence
	USFWS	CDFG	
Myotis thysanodes Fringed myotis	SOC	—	Roosting: Low Foraging: Moderate
Myotis volans Long-legged myotis	SOC	—	Roosting: Moderate Foraging: Moderate
Myotis yumanensis Yuma myotis	SOC	—	Roosting: Low Foraging: Moderate
Onychomys torridus ramona Southern grasshopper mouse	SOC	SSC	None; no suitable habitat
Perognathus alticola alticola White-eared pocket mouse	SOC	SSC	None; presumed extinct locally
Plecotus townsendii townsendii Pacific western big-eared bat	SOC	SSC	Roosting: None Foraging: Moderate

Status Definitions1
USFWS

FE: Species designated as Endangered under the Federal Endangered Species Act. Endangered = "any species in danger of extinction throughout all or a significant portion of its range."
FT: Species designated as Threatened under the Federal Endangered Species Act. Threatened = "species likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range."
FPE: Proposed for federal listing as Endangered.
FPT: Proposed for federal listing as Threatened.
SOC: Species of Concern

CDFG

SR: Rare = "a species is rare when, although not presently Threatened with extinction, it is in such small numbers throughout its range that it may become Endangered if its present environment worsens."
ST: Threatened = "a species that, although not presently Threatened with extinction, is likely to become an Endangered species in the foreseeable future in the absence of the special protection and management efforts required by this Act (California Endangered Species Act)."
SE: Endangered = "a species is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes."
SSC: Species of Special Concern.

FP: Fully Protected species are protected by special legislation and cannot be taken at any time.
P: Protected species are also protected by special legislation and can only be taken with a permit issued by the CDFG.

DEFINITIONS OF SPECIAL STATUS BIOLOGICAL RESOURCES

Special status habitats are vegetation communities, associations, or subassociations that support concentrations of special status plant or wildlife species, are of relatively limited distribution, or are of particular value to wildlife. Although special status habitats are not afforded legal protection unless they support protected species, potential impacts on them may increase concerns and mitigation suggestions by resources agencies.

A Federally Endangered species is one facing extinction throughout all or a significant portion of its geographic range. A Federally Threatened species is one likely to become endangered within the foreseeable future throughout all or a significant portion of its range. The presence of any federally Threatened or Endangered species on a Project site generally imposes severe constraints on development, particularly if development would result in "take" of the species or its habitat. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct. Harm in this sense can include any disturbance to habitats used by the species during any portion of its life history.

The reference to "proposed species" are those officially proposed by the USFWS for addition to the Federal Threatened and Endangered species list. Because proposed species may become listed as Threatened or Endangered prior to or during implementation of a proposed development project, they are treated in this EIR as though they are listed species.

The State of California considers an Endangered species as one whose prospects of survival and reproduction are in immediate jeopardy. Threatened species is a species in such small numbers throughout its range that it is likely to become an Endangered species in the near future in the absence of special protection or management. A rare species is one present in such small numbers throughout its range that it may become Endangered if its present environment worsens. Rare species applies to California native plants listed prior to the State Endangered Species Act. State Threatened and Endangered species are fully protected against take unless an incidental take permit is obtained from the wildlife agencies.

Federal Species of Concern are species (a "term of art" for former Category 2 candidates) with an informal designation by the USFWS for some declining species that are not federal candidates for listing at this time, but are noted in the CNDDB (CDFG 2002a). This list of species is not actively maintained by the USFWS.

California Species of Special Concern is an informal designation used by the CDFG for some declining wildlife species that are not state candidates. This designation does not provide legal protection, but signifies that these species are recognized as special status by the CDFG.

Species that are California Fully Protected and Protected include those protected by special legislation for various reasons, such as the mountain lion and white-tailed kite. Fully protected species may not be taken or possessed at any time. California Protected Species include those species that may not be taken or possessed at any

time except under special permit from the department issued pursuant to Sections 650 and 670.7 of the California Code of Regulations, or Section 2081 of the Fish and Game Code.

Special Plant and Special Animal are general terms that refer to all of the species the CNDDB is interested in tracking, regardless of their legal or protection status. This term includes species designated as any of the above terms but also includes species that may be considered biologically rare, restricted in distribution, declining throughout their range, are on the periphery of their range and are threatened with extirpation in California, are associated with special status habitats, or are considered by other state or federal agencies or private organizations to be sensitive or declining. Species of Local Concern are those that have no official status with the resource agencies, but are being watched because either there is a unique population in the region or the species is declining in the region.

The California Native Plant Society is a private organization that has developed an inventory of California's special status plant species. This inventory summarizes the distribution, rarity, and endangerment of California's vascular plants. This rare plant inventory is comprised of four lists. CNPS presumes that List 1A plant species are extinct in California because they have not been seen in the wild for many years. CNPS considers List 1B plants as rare, threatened, or endangered throughout their range. List 2 plant species are considered rare, threatened, or endangered in California but more common elsewhere. Plant species for which CNPS needs additional information are included on List 3. List 4 plant species are those of limited distribution in California whose susceptibility to threat appears low at this time.

SPECIAL STATUS VEGETATION TYPES

Pebble Plain

The pebble plain community found on the Project site is recognized as a special status vegetation type by local, state, and federal resources agencies. Pebble plain (also called pavement plain) is endemic to a 92-square-mile area in the San Bernardino Mountains at elevations between 6,000 and 7,500 feet above msl. Vegetation structure of pebble plain habitat is similar to the mat-forming structure of alpine sites at much higher elevations. Vegetation consists largely of well-spaced cushion-forming perennials and a variety of tiny annuals. Bunchgrasses and some succulents may also occur. Several special status plants, including Threatened or Endangered species, are known to occur on pebble plain and are discussed in the *Special Status Plants* section.

Pebble plain on the Project site occurs as a distinct open patch within the surrounding open Jeffrey pine forest. Much of the pebble plain habitat on the Project site has been subjected to disturbance by unauthorized off-road vehicle use. The disturbance has reduced vegetation cover, disturbed the natural hydrologic pattern, and perhaps reduced habitat quality for special status plants. However, based on National Forest management efforts at other sites, vehicle disturbance apparently does not permanently alter habitat suitability of this vegetation type.

Montane Meadow

Small patches of meadow transitioning into upland grassland occur along the lakeshore south of State Route 38. The extent of the meadows could not be determined or mapped in 2002 due to dry conditions. Meadows in the Big Bear Valley may be perennially saturated (i.e., wet meadows) or may have seasonally saturated soils during wet years (i.e., vernal meadows). This vegetation type is generally dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.), and grasses (*Poa* spp., *Elymus* spp.). Dry meadows and the margins of wet meadows may also support big sagebrush (*Artemisia tridentata*) and timberline sagebrush (*Artemisia rothrockii*).

Meadow habitat in the San Bernardino Mountains is not officially recognized as a special status vegetation type by the CDFG but it is known to support several locally endemic plants [e.g., bird's foot checkerbloom (*Sidalcea pedata*), San Bernardino bluegrass (*Poa atropurpurea*), and California dandelion (*Taraxacum californicum*)] and is therefore considered to be of local concern. Additionally, the San Bernardino National Forest recognizes montane meadow habitat as a rare ecological community of concern.

SPECIAL STATUS PLANTS

Eighty-one special status plant species are known to occur in the Project region, 50 of which occur or have the potential to occur on the Project site. A brief description of the special status plant species that were determined to have potential to occur on the Project site are outlined below and summarized in Table 5.8-2. As indicated in Table 5.8-2, four special status plant species have been observed on the Project site.

Coville's Dwarf Abronia (*Abronia nana* ssp. *covillei*). Coville's dwarf abronia is a CNPS List 4 species that typically blooms from May to August. This perennial herb occurs in carbonate, sandy soils in Joshua tree woodland, pinyon-juniper woodland, subalpine coniferous forest, and upper montane coniferous forest between 5,200 and 9,200 feet above msl. This species occurs in the Inyo, Mono, and San Bernardino counties. The Project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be low.

Parish's Onion (*Allium parishii*). Parish's onion is a CNPS List 4 species that typically blooms from April to May. This perennial, bulbiferous herb occurs in rocky soils of Joshua tree woodland, Mojavean desert scrub, and pinyon-juniper woodland between 3,000 and 6,000 feet above msl. This species occurs in the Imperial, Riverside, and San Bernardino counties. The Project site provides suitable habitat for this species but is above the known elevation range for this species and the potential for occurrence is considered to be low.

Parish's Rock-Cress (*Arabis parishii*). Parish's rock cress is a CNPS List 1B species that typically blooms from April to May. This perennial herb occurs in rocky, quartzite and clay, or sometimes carbonate soils in pebble plains, pinyon-juniper woodlands, and upper montane coniferous forests from approximately 3,900 to 8,000 feet above msl. It is endemic to the San Bernardino Mountains. This species was observed

uncommonly in scattered patches throughout pebble plain and open Jeffrey pine forest on the Project site during botanical surveys conducted in 2002.

Rock Sandwort (*Arenaria lanuginosa* ssp. *saxosa*). Rock sandwort is a CNPS List 2 species that typically blooms from July to August. This perennial herb occurs in mesic, sandy soils of subalpine, coniferous forests, and upper montane coniferous forests from approximately 5,900 to 9,000 feet above msl. It is found only in the San Bernardino Mountains in the state of California but also occurs in Arizona, Baja California, and elsewhere. The Project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be moderate.

Big Bear Valley Sandwort (*Arenaria ursina*). Big Bear Valley sandwort is a federally-listed Threatened and CNPS List 1B species that typically blooms from May to August. This perennial herb occurs in mesic, rocky soils of pebble plain, and pinyon-juniper woodland from approximately 6,400 to 6,900 feet above msl. This species is endemic to the San Bernardino Mountains. The Project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Crested Milk-Vetch (*Astragalus bicristatus*). Crested milk-vetch is a CNPS List 4 species that typically blooms from May to August. This perennial herb occurs in sandy or rocky soils of lower and upper montane coniferous forests from approximately 5,500 to 8,200 feet above msl. This species is found in the San Bernardino, San Gabriel, and San Jacinto mountains. The Project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Big Bear Valley Milk-Vetch (*Astragalus lentiginosus* var. *sierrae*). Big Bear Valley milk-vetch is a CNPS List 1B species that typically blooms from April to August. This perennial herb occurs in gravelly or rocky soils of desert scrub, meadows and seeps, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,800 to 8,500 feet above msl. It is found in the San Bernardino, San Gabriel, San Jacinto, and Santa Rosa mountains. The Project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Big Bear Valley Woollypod (*Astragalus leucolobus*). Big Bear Valley woollypod is a CNPS List 1B species that typically blooms from May to July. This perennial herb occurs in rocky soils of lower montane coniferous forest, pebble plain, pinyon-juniper woodland, and upper montane coniferous forests from approximately 5,600 to 8,000 feet above msl. It is found in the San Bernardino, San Gabriel, San Jacinto, and Santa Rosa mountains. This species was observed throughout the Project site during botanical surveys conducted in 2002.

Palmer's Mariposa Lily (*Calochortus palmeri* var. *palmeri*). Palmer's mariposa lily is a CNPS List 1B species that typically blooms between May and July. This perennial, bulbiferous herb occurs in mesic chaparral, lower montane coniferous forest, meadows, and seeps from approximately 3,200 to 7,200 feet above msl. It is a California endemic found in the South Coast and Transverse ranges in Kern, Los Angeles, Riverside, Santa Barbara, San Bernardino, San Luis Obispo, and Ventura counties. This species was not observed during the 2002 botanical surveys.

However, it has a moderate potential to occur on the project site given the availability of marginally suitable habitat in mesic portions of Jeffrey pine forest.

Ash-Gray Indian Paintbrush (*Castilleja cinerea*). Ash-gray Indian paintbrush is a federally-listed Threatened and CNPS List 1B species. It is a root parasite on other plants, often parasitizing the Federally-listed Threatened southern mountain buckwheat and Wright's matting buckwheat. It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows, seeps, and open pinyon or Jeffrey pine forest from approximately 5,900 to 9,300 feet above msl and is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). This species was reported and mapped on the project site by Michael Brandman Associates (MBA) (MBA 2000) and the California Natural Diversity Data Base (CDFG 2001). Botanical surveys in 2002 identified populations of this species throughout approximately 11.8 acres of pebble plain and open Jeffrey pine forest in the western half of the project site where it appears to be parasitizing Wright's matting buckwheat (see Exhibit 3). Populations of this species were found to be more widespread than reported previously and would be expected to occur in higher concentrations within the mapped Wright's matting buckwheat areas during normal rainfall years.

San Bernardino Mountain Owl's Clover (*Castilleja applegateii* ssp. *martinii*). San Bernardino Mountain owl's clover is a CNPS List 1B species that typically blooms between June and August. This hemiparasitic, annual herb occurs in mesic chaparral, meadows and seeps, pebble plain, and upper montane coniferous forests from approximately 4,200 to 7,850 feet above msl. It is a California endemic found in Riverside and San Bernardino counties. This species was not observed during the 2002 botanical surveys. However, it has a high potential to occur on the project site given the availability of suitable habitat throughout the project site, especially within pebble plains and open Jeffrey pine forest where Wright's matting buckwheat occurs.

Male Fern (*Dryopteris filix-mas*). Male fern is a CNPS List 2 species that is typically fertile from July to September. This rhizomatous, perennial herb occurs in granitic, rocky soils of upper montane coniferous forests from approximately 7,800 to 10,200 feet above msl. This species is known from only two locations in the White Mountains and Holcomb Valley in Inyo and San Bernardino counties respectively. The project site provides suitable habitat; however, the project site is outside the known range of this local rarity and the potential for occurrence is considered to be low.

San Bernardino Mountains Dudleya (*Dudleya abramsii* ssp. *affinis*). The San Bernardino Mountains dudleya is a CNPS List 1B species that typically blooms from April to June. This perennial herb occurs in granitic, quartzite, or carbonate soils of pebble plain, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,800 to 8,500 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be moderate.

Leafy Buckwheat (*Eriogonum foliosum*). Leafy buckwheat is a CNPS List 1B species that typically blooms from July to October. This annual herb occurs in sandy soils of chaparral, lower montane coniferous forest, and pinyon-juniper woodland from

approximately 3,900 to 7,200 feet above msl. This species is found in scattered locations from Big Bear Valley south to Baja California. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Southern Mountain Buckwheat (*Eriogonum kennedyi* var. *austromontanum*). Southern mountain buckwheat is a Federally-listed Threatened and CNPS List 1B species that typically blooms between June and August. It is a mat-forming, woody perennial endemic to pebble plain habitats in Big Bear and Holcomb valleys in the San Bernardino Mountains from approximately 5,800 to 7,500 feet above msl. This species often serves as a host plant for the hemi-parasitic ash-gray Indian paintbrush and is also a food plant for the recently described, locally-endemic San Bernardino blue butterfly (*Euphilotes bernardino bernardino*). It is very similar to the more common Wright's matting buckwheat that is common on the project site. Southern mountain buckwheat was not seen during the 2002 botanical surveys and it has not been reported on the project site by other botanists (MBA 2000; CDFG 2001). However, it is considered to have a low potential to occur given that suitable habitat occurs within pebble plains on the project site.

Southern Sierra Woolly Sunflower (*Eriophyllum lanatum* var. *obovatum*). Southern Sierra woolly sunflower is a CNPS List 4 species that typically blooms from June to July. This perennial herb occurs in lower and upper montane coniferous forest from approximately 4,200 to 8,100 feet above msl. This species is found in the southern Sierra Nevada and western San Bernardino mountains. The project site provides suitable habitat for this species; however, the project site is on the margin of this species geographic range and the potential for occurrence is considered to be low.

Jepson's Bedstraw (*Galium jepsonii*). Jepson's bedstraw is a CNPS List 4 species that typically blooms from July to August. This rhizomatous, perennial herb occurs in granitic, rocky or gravelly soils in lower and upper montane coniferous forests from approximately 6,500 to 8,100 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Johnston's Bedstraw (*Galium johnstonii*). Johnston's bedstraw is a CNPS List 4 species that typically blooms from June to July. This perennial herb occurs in chaparral, lower montane coniferous forest, pinyon-juniper woodland, and riparian woodland from approximately 5,300 to 7,500 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

San Bernardino Mountains Gilia (*Gilia leptantha* ssp. *leptantha*). San Bernardino Mountains gilia is a List 1B species that typically blooms from June to August. This annual herb occurs in sandy or gravelly soils of lower montane coniferous forests from approximately 5,000 to 7,700 feet above msl. This species is endemic to the upper Santa Ana River watershed in the San Bernardino Mountains. The project site provides suitable habitat for this species; however, it has not been recorded in the Big Bear valley and the potential for occurrence is considered to be low.

Shaggy-Haired Alumroot (*Heuchera hirsutissima*). Shaggy-haired alumroot is a CNPS List 1B species that typically blooms from May to July. This rhizomatous, perennial herb occurs in rocky soils of subalpine coniferous forest, and upper montane coniferous forest above approximately 7,200 feet above msl. This species is endemic to the San Jacinto and Santa Rosa mountains with one uncomfirmed record for the San Bernardino Mountains. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be low.

Parish's Alumroot (*Heuchera parishii*). Parish's alumroot is a CNPS List 1B species that typically blooms from June to July. It is a rhizomatous perennial herb that occurs in rocky soils of alpine boulder and rock fields, lower montane coniferous forest, subalpine coniferous forest, and upper montane coniferous forest above approximately 4,800 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be low.

Silver-Haired Ivesia (*Ivesia argyrocoma*). Silver-haired ivesia is a CNPS List 1B species that typically blooms between June and August. This perennial herb occurs in alkaline meadows and seeps, pebble plains, and upper montane coniferous forest from approximately 4,900 to 8,800 feet above msl. It occurs in the San Bernardino Mountains and a disjunct population occurs in the mountains of Baja California. This species was reported on the project site by MBA (MBA 2000) and was observed throughout mapped pebble plain habitat on the project site during the 2002 botanical surveys.

Duran's Rush (*Juncus duranii*). Duran's rush is a CNPS List 4 species that typically blooms from July to August. It is a rhizomatous, perennial herb that occurs in mexic soils of lower montane coniferous forest, meadows and seeps, and upper montane coniferous forest from approximately 5,800 feet to 9,000 feet above msl. This species is found in the San Bernardino, San Gabriel, and San Jacinto mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Short-Sepaled Lewisia (*Lewisia brachycalyx*). Short-sepaled lewisia is a CNPS List 2 species that typically blooms from May to June. It is a perennial herb that occurs in mesic meadows and seeps, and lower montane coniferous forest from 4,500 to 7,500 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be moderate.

Lemon Lily (*Lilium parryi*). Lemon lily is CNPS List 1B species that typically blooms from July to August. It is a bulbiferous, perennial herb that occurs in lower and upper montane coniferous forests, meadows and seeps, and riparian scrub above approximately 4,000 feet above msl. This species is found in the mountain ranges of southern California and southeastern Arizona. The project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be low.

Baldwin Lake Linanthus (*Linanthus killipii*). The Baldwin Lake linanthus is a CNPS List 1B species that blooms from May to July. It is an annual herb that occurs in

alkaline meadows and seeps, pebble plain, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,500 to 7,800 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

San Bernardino Mountain Monkeyflower (*Mimulus exiguus*). The San Bernardino Mountain monkeyflower is a CNPS List 1B species that typically blooms from June to July. It is an annual herb that occurs in mesic, clay soils of meadows and seeps, pebble plain, and upper montane coniferous forest between approximately 5,800 and 7,500 feet above msl. This species is found in the San Bernardino Mountains and high mountains of Baja California. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Purple Monkeyflower (*Mimulus purpureus* var. *purpureus*). Purple monkeyflower is a CNPS List 2 species that typically blooms from May to July. It is an annual herb that occurs in meadows and seeps, pebble plain, and upper montane coniferous forest from approximately 6,100 to 7,500 feet above msl. This species is found in the San Bernardino Mountains and high mountains of Baja California. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Baja Navarretia (*Navarretia peninsularis*). Baja navarretia is a CNPS List 1B species that blooms from July to September. It is an annual herb that occurs in mesic, sandy soils in chaparral and lower montane coniferous forests between approximately 4,800 and 7,500 feet above msl. This species is found in the mountains of central and southern California and north Baja California. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be low.

Chickweed Oxytheca (*Oxytheca caryophylloides*). Chickweed oxytheca is a CNPS List 4 species that typically blooms from July to September. It is an annual herb that occurs in sandy soils of lower montane coniferous forest from approximately 3,900 to 8,500 feet above msl. This species is found in the southern Sierra Nevada, Transverse Ranges, and San Jacinto Mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Cienega Seca Oxytheca (*Oxytheca parishii* var. *cienegensis*). The cienega seca oxytheca is a CNPS List 1B species that typically blooms from June to September. It is an annual herb that occurs in sandy, granitic soils in upper montane coniferous forest from approximately 7,000 to 8,000 feet above msl. This species is found along Coon Creek and Cienega Seca Creek in San Bernardino County. The project site provides suitable habitat for this species; however, the project site is well outside the known geographic range for this species and the potential for occurrence is considered to be low.

Parish's Yampah (*Perideridia parishii* ssp. *parishii*). Parish's yampah is a CNPS List 2 species that typically blooms from June to August. It is a perennial herb that occurs in lower and upper montane coniferous forests, and meadows and seeps above approximately 6,500 feet above msl. This species is found in the San

Bernardino Mountains and in disjunct populations in Arizona and New Mexico. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Transverse Range Phacelia (*Phacelia exilis*). The Transverse Range phacelia is a CNPS List 4 species that typically blooms from May to August. It is an annual herb that occurs in sandy or gravelly soils in lower and upper montane coniferous forests, and meadows and seeps from approximately 3,500 to 8,500 feet above msl. This species is found in the southern Sierra Nevada and Transverse Ranges. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Mojave Phacelia (*Phacelia mohavensis*). The Mojave phacelia is a CNPS List 4 species that typically blooms from April to August. It is an annual herb that occurs in sandy or gravelly soils of cismontane woodland, lower montane coniferous forest, meadows and seeps, and pinyon-juniper woodland from approximately 4,500 to 8,100 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Bear Valley Phlox (*Phlox dolichantha*). The Bear Valley phlox is a CNPS List 1B species that blooms from June to July. It is a perennial herb that occurs in pebble plain, and upper montane coniferous forest from approximately 6,500 to 8,800 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

San Bernardino Bluegrass (*Poa atropurpurea*). San Bernardino bluegrass is a Federally-listed Endangered and CNPS List 1B species that typically blooms from May to June. It is a rhizomatous, perennial herb that occurs in mesic meadows and seeps between approximately 4,800 and 7,200 feet above msl. This species is found in the San Bernardino and Laguna mountains (San Diego). The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Bear Valley Pyrrocoma (*Pyrrocoma uniflora* ssp. *gosssypina*). Bear Valley pyrrocoma is a CNPS List 1B species that typically blooms from July to August. It is a perennial herb that occurs in meadows and seeps, and pebble plain from approximately 5,200 to 7,600 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Parish's Rupertia (*Rupertia rigida*). Parish's rupertia is a CNPS List 4 species that typically blooms from June to July. It is a perennial herb that occurs in chaparral, cismontane woodland, and lower montane coniferous forest below approximately 8,100 feet above msl. This species is found in the San Bernardino Mountains, Peninsular Ranges, and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Bluish Spike-Moss (*Selaginella asprella*). Bluish spike-moss is a CNPS List 4 species that typically blooms in July. It is a rhizomatous, perennial herb that occurs in granitic, rocky soils of cismontane woodland, lower and upper montane coniferous forests, pinyon-juniper woodland, and subalpine coniferous forest between approximately 5,200 to 8,800 feet above msl. This species occurs throughout southern California mountain ranges and Baja California. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be low.

San Bernardino Butterweed (*Senecio bernardinus*). San Bernardino butterweed is a CNPS List 1B species that typically blooms from May to July. It is a perennial herb that occurs in meadows and seeps, pebble plain, and upper montane coniferous forest between approximately 5,800 to 7,500 feet above msl. This species is endemic to the San Bernardino Mountains and is known from fewer than twenty occurrences. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be low.

Parish's Checkerbloom (*Sidalcea hickmanii* ssp. *parishii*). Parish's checkerbloom is a Federal Candidate for listing as Threatened or Endangered, State Rare, and CNPS List 1B species that typically blooms from June to July. It is a perennial herb that occurs in chaparral, cismontane woodland, and lower montane coniferous forest between 3,200 and 8,200 feet above msl. This species is found mainly in the San Bernardino Mountains and in a few localities in the Santa Ynez Mountains. The project site provides limited suitable habitat for this species and potential for occurrence is considered to be low.

Bird's Foot Checkerbloom (*Sidalcea pedata*). Bird's foot checkerbloom is a Federally- and State-listed Endangered and CNPS 1B species that typically blooms from May to July. It is a perennial herb that occurs in meadows and seeps, and pebble plain between approximately 5,200 and 8,100 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides marginally suitable habitat for this species and the potential to occur is considered to be low to moderate.

Prairie Wedge Grass (*Sphenopholis obtusata*). Prairie wedge grass is a CNPS List 2 species that typically blooms from April to July. It is a perennial herb that occurs in mesic soils of cismontane woodland, meadows and seeps between approximately 1,000 and 6,550 feet above msl. This species is found in a few widely scattered locations in Amador, Fresno, Inyo, Mono, Riverside, and San Bernardino counties in California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Laguna Mountains Jewelflower (*Streptanthus bernardinus*). The Laguna Mountains jewelflower is a CNPS List 4 species that typically blooms from June to July. It is a perennial herb that occurs in chaparral, and lower montane coniferous forest between approximately 3,900 and 8,100 feet above msl. This species is found in the Transverse and Peninsular ranges and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Southern Jewelflower (*Streptanthus campestris*). The southern jewelflower is CNPS List 1B species that typically blooms from May to July. It is a perennial herb that occurs in rocky soils of chaparral, lower montane coniferous forest, and pinyon-juniper woodland from approximately 2,900 to 7,500 feet above msl. This species is known from fewer than twenty occurrences in Riverside, San Bernardino, and San Diego counties, and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Pine Green-Gentian (*Swertia neglecta*). Pine green-gentian is a CNPS List 4 species that typically blooms from May to July. It is a perennial herb that occurs in lower and upper montane coniferous forests, and pinyon-juniper woodlands from approximately 4,500 to 8,100 feet above msl. This species is found in the South Coastal and Transverse ranges within Los Angeles, San Bernardino, and Ventura counties. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

California Dandelion (*Taraxacum californicum*). The California dandelion is a Federally-listed Endangered and CNPS List 1B species that typically blooms from May to July. It is a perennial herb that occurs in mesic meadows and seeps from approximately 6,300 to 7,800 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be low to moderate.

Slender-Petaled Thelypodium (*Thelypodium stenopetalum*). Slender-petaled thelypodium is a Federally- and State-listed Endangered and CNPS List 1B species that typically blooms from June to July. It is a perennial herb that occurs in mesic, alkaline meadows and seeps from approximately 6,200 to 7,200 feet above msl. This species is endemic to the San Bernardino Mountains with less than eight known populations in the Big Bear and Holcomb valleys. The project site contains marginally suitable habitat for this species and the potential to occur is considered to be low.

Small-Flowered Bluecurls (*Trichostema micranthum*). Small-flowered bluecurls is a CNPS List 4 species that typically blooms from July to September. It is an annual herb that occurs mesic soils in lower montane coniferous forest, and meadows and seeps from 6,500 to 7,500 feet above msl. This species is found in the San Bernardino Mountains and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Grey-Leaved Violet (*Viola pinetorum* ssp. *grisea*). Grey-leaved violet is a CNPS List 1B species that typically blooms in April. It is a perennial herb that occurs in meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest from approximately 4,800 to 11,100 feet above msl. This species is known from ten occurrences in Fresno, Kern, San Bernardino, and Tulare counties. There is disagreement about the range of this species. The project site provides suitable habitat for this species; however, the project site is outside the known geographic range for this species and the potential to occur is considered to be low.

SPECIAL STATUS WILDLIFE

Fifty-three special status wildlife species are known to occur within the region, 39 of which have the potential to occur within the Project site. Focused surveys for the bald eagle, California spotted owl, southwestern willow flycatcher, and southern rubber boa were conducted in the winter, spring, summer and fall of 2002. A brief description of the special status wildlife species that were determined to have the potential to occur on the Project site is provided below and summarized in Table 5.8-3. As indicated in Table 5.8-3, one special status wildlife species (Southern sagebrush lizard) has been observed on the Project site.

Invertebrates

Andrew's Marble Butterfly (*Euchloe hyantis* ssp. *andrewsi*). Andrew's marble butterfly is a Federal Species of Concern. This species is found at elevations above 5,000 feet above msl near Lake Arrowhead and Big Bear Lake, and in other locations across the San Bernardino Mountains crest and north slopes. It is found primarily in pine and mixed conifer forests. The larval host plants for this subspecies are the Laguna Mountains jewelflower and *Arabis holboellii*. The Project site provides limited suitable habitat for this species; however, the Project site is above the known elevation range. The potential for this butterfly species to occur is considered to be low.

Amphibians

Yellow-Blotched Salamander (*Ensatina escholtziii croceater*). The yellow-blotched salamander is a Federal Species of Concern and State Species of Special Concern. This species is found at elevations up to 8,000 feet above msl among rotting logs and leaf litter in mixed stands of oaks and conifers. The Project site provides limited, marginally suitable habitat and the potential for it to occur is considered to be low.

Reptiles

Silvery Legless Lizard (*Anniella pulchra pulchra)*. The silvery legless lizard is a Federal Species of Concern and a State Species of Special Concern. The silvery legless lizard inhabits areas with moist sandy soil, including dry washes, woodlands, riparian, and scrub communities at elevations ranging from sea level to about 5,000 feet above msl. The Project site provides a limited amount of potentially suitable habitat for this species; however, the Project site is above the known elevation range for this species and its potential to occur is considered to be low.

Southern Rubber Boa (*Charina bottae umbbricata*). The southern rubber boa is a Federal Species of Concern and State-listed Threatened species found in the San Bernardino and San Jacinto mountains at elevations between 4,900 and 7,900 feet above msl. The majority of the localities for this species are in a 10-mile long strip of the San Bernardino Mountains between Twin Peaks in the west to Green Valley in the east. Known locations for this species occur on the north-facing slopes immediately south of Big Bear Lake. This species usually occurs in moist woodlands and coniferous forests with deep, well developed soils. It is a burrower and also commonly makes use of rock out crops for hibernation. Large downed logs and a

well-developed litter layer are considered important for cover and for maintaining soil moisture. Surveys for this species were conducted in the spring and summer of 2002. No southern rubber boas were encountered during surveys. Given the lack of historical records in the immediate vicinity of the Project site, and the negative results of two independent focused survey techniques, the southern rubber boa is not expected to occur on the Project site.

Coastal Western Whiptail (*Cnemidophorus tigris multiscutatus*). The coastal western whiptail is a Federal Species of Concern. It is a moderately large, slender lizard typically found in open scrub, chaparral, and woodland communities in semi-arid areas or where vegetation is sparse, from below sea level to 7,000 feet above msl. This species is restricted to the western coast of North America from Ventura County south through the northern two-thirds of the Baja California peninsula. The Project site provides suitable habitat for this species; however, it is at the maximum elevation for this species and its potential to occur is considered to be moderate.

San Bernardino Ringneck Snake *(Diadophis punctatus modestus*). The San Bernardino ringneck snake is a Federal Species of Concern and is considered locally rare in southwestern California. It inhabits scrub, chaparral, native grassland, and woodland communities. This species is difficult to detect due to its secretive behavior. It occurs in elevations from sea level to 7,000 feet above msl (Stebbins 1985). The Project site provides limited suitable habitat for this species and its potential to occur is considered to be low.

San Bernardino Mountain Kingsnake (*Lampropeltis zonata parvirubra*). The San Bernardino mountain kingsnake is a Federal Species of Concern that occurs in the San Jacinto, San Bernardino, and San Gabriel mountains. This species typically occurs in open stands of ponderosa pine, Jeffrey pine, Coulter pine, and/or black oak at elevations ranging from 4,500 to 6,500 feet above msl. This species occurs at higher elevations, but is less common. Partially shaded rock outcrops appear to be an important microhabitat element for refugia and basking sites. The Project site provides marginally suitable habitat for this species and its potential to occur is considered to be moderate.

Southern Sagebrush Lizard (*Sceloporus graciosus vandenbergianus*). The southern sagebrush lizard is a Federal Species of Concern that occurs in open coniferous forests and shrubland above 3,000 feet above msl. Its known range extends from Mount Pinos south to Baja California. This species inhabits mixed conifer forest, black oak woodlands, montane chaparral, and pinyon-juniper woodlands. This species was observed frequently on the Project site.

Birds

Cooper's Hawk (*Accipiter cooperii*). The Cooper's hawk is a State Species of Special Concern. Both resident and migratory populations exist in San Bernardino County. Wintering Cooper's hawks are often seen in wooded urban areas and native woodland communities. Preferred nesting habitats include riparian forests, mountain canyons, and oak woodlands. Cooper's hawks in the region prey on small birds and rodents that live in woodland and, occasionally, scrub and chaparral communities.

Breeding residents have been observed in the vicinity of Big Bear Lake. The Project site provides suitable foraging habitat, but a limited amount of nesting habitat for this raptor. Therefore, its overall potential to occur is considered to be high, although the potential for nesting is moderate.

Northern Goshawk (*Accipiter gentilis*). The northern goshawk is a Federal Species of Concern and State Species of Special Concern. Rare in southern California, goshawks have been observed during the breeding season only on Mount Abel, Mount Pinos, and in the San Bernardino and San Jacinto mountains. Breeding has not been documented in the San Bernardino Mountains, although goshawks have been observed near Big Bear Lake. Goshawks occur in a variety of coniferous forest communities, including ponderosa and Jeffrey pine, mixed conifer, white fire and lodgepole pine. Large snags and downed logs are believed to be important habitat elements because they increase the abundance of small- to medium sized birds and mammals composing this species prey base. Limited suitable foraging habitat is present on the Project site and the potential for this species is considered moderate for foraging, but no potential for nesting.

Sharp-shinned Hawk (*Accipiter striatus*). The sharp-shinned hawk is a State Species of Special Concern. This raptor is a fairly common winter visitor throughout southern California. It prefers woodland communities, but can also be found in virtually any habitat as it passes through the area during migration. The sharp-shinned hawk is a fairly common winter visitor in the Big Bear Lake vicinity, and its potential to occur for foraging is considered to be high. However, the Project site provides no nesting habitat for this raptor.

Golden Eagle (*Aquila chryysaetos*). The golden eagle is a State Species of Special Concern. This raptor is uncommon, but widely distributed throughout foothill, lower montane, and desert montane habitats in southern California. Golden eagles nest primarily on cliffs and hunt for rabbits and other small mammals in open habitats such as grasslands, oak savannas, and open shrublands. No nesting habitat is present on the Project site; however, the potential for foraging on the Project site is considered high.

Long-eared Owl (*Asio otus)*. The long-eared owl is a State Species of Special Concern. It breeds and roosts in riparian forests and woodlands or other dense forest habitats. This owl forages at night in open habitats including marshes, grasslands, and agricultural fields. It occurs throughout North America but is an increasingly rare breeder in southern California. The Project site provides moderate suitable foraging habitat and limited nesting habitat, for this species.

Ferruginous Hawk (*Buteo regalis*). The ferruginous hawk is a Federal Species of Concern and a State Species of Special Concern. Ferruginous hawks occur from mid-fall through early spring in coastal southern California. They forage over grasslands and the ecotone between scrub and grasslands. The Project site provides a limited amount of suitable foraging habitat, but no nesting habitat, for this species. Therefore, its potential to occur on the Project site is considered to be low for foraging, with no potential for nesting.

Northern Harrier (*Circus cyaneus*). The northern harrier is a State Species of Special Concern. It is a regular winter migrant that occasionally breeds along the coast of southern California. Foraging habitat consists of marsh, grassland, and scrub habitats. The Project site provides limited suitable foraging habitat, but no nesting habitat, for this raptor. Therefore, its potential to forage on the Project site is considered to be low.

Black Swift (*Cypseloides niger*). The black swift is a State Species of Special Concern. It is known to breed in the San Gabriel Mountains, Mill Creek Canyon in the San Bernardino Mountains, and the San Jacinto Mountains. This species occurs in mountain and foothill canyons where it nests in rocky cliffs behind waterfalls. No suitable nesting habitat is present on the Project site; however, this Project site could provide suitable foraging habitat and the potential for this species to forage on the Project site is considered moderate.

Yellow Warbler (*Dendroica petechia*). The western yellow-warbler is a California Species of Special Concern. This subspecies of yellow warbler that breeds in southern California is the western yellow warbler (*D.p. brewsteri*). This subspecies occurs in coastal areas from northwestern Washington south to western Baja California. In southern California, yellow warblers breed locally in riparian woodlands. The yellow warbler is an abundant migrant and would be expected to occur in spring and fall during migration. No suitable nesting habitat is present on the Project site; however, the potential for foraging migrants on the Project site is considered moderate.

White-Tailed Kite (*Elanus leucereus*). The white-tailed kite is a California Fully Protected species. This raptor typically nests in oaks, willows, and sycamores, and forages within adjacent grassland and scrub habitats. White-tailed kites show strong site fidelity to nest groves and trees. The most abundant prey species for this raptor includes the California vole, western harvest mouse, and house mouse. The project site provides limited suitable foraging and nesting habitat for this raptor. Therefore, its potential to occur on the Project site is considered to be low for nesting and foraging.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*). The southwestern willow flycatcher is a Federally- and State-listed Endangered species. This subspecies has declined drastically due to a loss of breeding habitat and nest parasitism by brown-headed cowbirds. This species occurs in riparian habitats along rivers, streams, or other wetlands where dense growths of willows (*Salix* sp.), baccharis (*Baccharis* sp.), arrowweed (*Pluchea* sp.), tamarisk (*Tamarix* sp.), or other plants are present, often with a scattered overstory of cottonwood (*Populus* sp.). The potential for this species to occur on the Project site as a foraging migrant is considered to be high, but its potential to nest on the Project site is considered low. Surveys for this species were conducted in the spring and summer of 2002. No breeding or individual southwestern willow flycatchers were detected during the surveys. Willows along the shoreline are patchy and lack the dense growth or willow thicket favored by this species as territorial or breeding habitat. Therefore, breeding southwestern willow flycatchers are not expected to occur on the Project site.

Merlin (*Falco columbaris*). The merlin is a State Species of Special Concern. In California, the merlin prefers vast open space areas such as estuaries, grasslands, and deserts where it hunts small flocking birds such as sandpipers, larks, sparrows, and pipits. The merlin is a very rare winter visitor to the Big Bear Lake area. The Project site provides suitable foraging habitat and perching locations, but no nesting habitat, for this raptor. Therefore, its potential to occur for foraging is considered to be low, and there is no potential for nesting.

Prairie Falcon (*Falco mexicanus*). The prairie falcon is a State Species of Special Concern. It is now a rare visitor to the coastal plain of southern California. Foraging habitat for this species consists of open habitats such as deserts, grasslands, rangelands, and marshes. For nesting, this large falcon uses ledges of cliff faces. The Project site provides suitable foraging habitat for this raptor, but no potentially suitable nesting habitat. Therefore, its potential to occur is considered to be low for foraging only.

American Peregrine Falcon (*Falco peregrinus*). The peregrine falcon is a State-listed Endangered species that, due to recent population gains, has been recently delisted as Endangered by the USFWS. No such delisting has been proposed by the state. Peregrine falcons prey almost exclusively on birds and use a variety of habitats, particularly wetlands and coastal areas, and nest on cliffs or building ledges. The Project site provides limited suitable foraging habitat for the peregrine falcon, but no potentially suitable nesting habitat. Therefore, its potential to occur on the Project site is considered to be low for foraging only.

Osprey (*Pandion haliaetus*). The osprey is a California Species of Special Concern. It is an uncommon winter visitor in southern California, but nesting has been documented at Lake Casitas near Ventura and Lake San Antonio in Monterey County (Garrett and Dunn 1981) and may occur elsewhere. The osprey would be expected to occur on the project site during spring migration or post-breeding wandering. The Project site provides roosting and foraging habitat for the osprey, but no potentially suitable nesting habitat. Therefore, its potential to occur on the Project site is considered to be low for foraging only.

Bald Eagle (*Haliaeetus leucocephalus*). The bald eagle is a State- and Federally-listed Endangered species. This raptor typically overwinters in small numbers in southern California near lakes and reservoirs where they feed on fish, coots, and waterfowl. The largest known wintering population in southern California is at Big Bear Lake in the San Bernardino Mountains, where twenty to thirty eagles typically congregate from November to March. This species is known to be present on the Project site in winter but is not expected to nest on the Project site. Surveys and records searches were conducted on the Project site in the winter of 2002 to determine bald eagle use of perch trees and favored roosting locations (refer to Appendix 15.6, *Biological Resources Information*). The surveys found that the site is used extensively by bald eagles. Bald eagle perch and roost locations were recorded and individual trees were marked with numbered tags. Tree locations are shown on Exhibit 5.8-1. The records search confirmed extensive use of the Project site by bald eagles and found that the most commonly recorded use of a single tree was also on the Project site.

Hepatic Tanager (*Piranga flava*). The hepatic tanager is a State Species of Special Concern. In southern California, this species is known to breed only in the San Bernardino Mountains. Breeding habitat consists of mature pinyon pine woodland with a mixture of taller conifers such as white fir or Jeffrey pine. Johnson and Garrett suggest this species may also occur in pine and deciduous oak woodlands on warm, arid slopes. The Project site provides limited suitable foraging and nesting habitat for this species and potential for occurrence is considered to be low for foraging and nesting.

Purple Martin (*Progne subis*). The purple martin is a State Species of Special Concern that historically occurred throughout all of the major mountain ranges in southern California. Many historic localities are no longer occupied and there are no known active localities in the San Bernardino Mountains. This species is a secondary cavity nester of hardwood and conifer forests. The Project site provides suitable habitat for this species; however, given the lack of records in the vicinity, the potential for occurrence is considered to be low for foraging and nesting.

California Spotted Owl (*Strix occidentalis occidentalis*). The California spotted owl is a Federal Species of Concern and State Species of Special Concern. This species occurs in all of the major mountain ranges in southern California, although some ranges support very few pairs. It is found at elevations ranging from below 1,000 feet to 8,500 feet above msl in mature forests typically with a dense, multi-layered canopy. Its prey base consists of woodrats (i.e., *Neotoma* spp.) and other rodents. Surveys were conducted for this species on the Project site in the spring and summer of 2002 (refer to Appendix 15.6, *Biological Resources Information*). Although one male spotted owl was detected approximately one mile to the northwest of the Project site, no nesting pairs or individuals were observed on the Project site. Therefore, no nesting pairs presently occur on the Project site; however, individuals have a high potential to forage on the Project site.

Gray Vireo (*Vireo vicinior*). The gray vireo is a State Species of Special Concern. This species is a summer resident in a few highly localized areas on the coastal mountain ranges in southern California. It occurs on dry, desert-facing slopes in the San Gabriel, San Bernardino, and San Jacinto mountains. This species prefers stands of dense, mature chaparral dominated by chamise or redshank or on brushy slopes in pinyon-juniper woodlands. The Project provides limited, marginal habitat for this species. The potential for occurrence is considered to be low for foraging but there is no potential for breeding on the Project site.

Mammals

Pallid Bat (*Antrozus pallidus*). The pallid bat is a California Species of Special Concern that most commonly occurs in mixed oak and grassland habitats. This large bat roosts in rock crevices and in cavities of trees, especially oaks. The Project site provides potentially suitable roosting and foraging habitat for this species and it has a low potential to occur.

Spotted Bat (*Euderma maculatum*). The spotted bat is a Federal Species of Concern and State Species of Special Concern. Little is known about its distribution. Spotted bats forage in a wide variety of habitats but roost strictly in cliffs. The Project

site would provide foraging habitat for this species and it has a moderate potential to occur for foraging; however, no suitable roosting habitat is present.

California Mastiff Bat (*Eumops perotis californicus*). The California mastiff bat, the largest bat in the United States, is a Federal Species of Concern and a California Species of Special Concern. This species is a very wide-ranging and high-flying insectivore that typically forages in open areas with high cliffs. It roosts in crevices in small colonies. The Project site would provide limited foraging habitat for this species and it has a low potential to occur for foraging; however, no suitable roosting habitat is present.

San Bernardino Mountain Flying Squirrel (*Glaucomys sabrinus californicus*). The San Bernardino Mountain flying squirrel is a Federal Species of Concern and State Species of Special Concern. It occurs in the San Bernardino Mountains between 5,200 and 8,500 feet above msl. This species prefers mid- to upper-elevation, dense, mature coniferous forest habitats, particularly those containing white fir. They use cavities in large trees, snags, and logs for cover. The Project site provides suitable foraging habitat for this species and the potential for occurrence is considered high; however, the potential for this species to breed on the Project site is considered to be low as this species prefers to breed in relatively dense coniferous forests in proximity to riparian areas.

Small-footed Myotis (*Myotis ciliolabrum*). The small-footed myotis is a Federal Species of Concern that occurs throughout much of the western United States, occupying a variety of habitats. This species feeds among trees or over brush, and roosts in cavities of cliffs, trees, or rocks and within caves or mine shafts. The Project site provide potentially suitable roosting and foraging habitat for this species and the potential for occurrence is considered to be low for roosting and high for foraging.

Long-eared Myotis (*Myotis evotis*). The long-eared myotis is a Federal Species of Concern that is restricted to high-elevation habitats. It is known to occur in Coon Creek in the San Bernardino National Forest. This species can occur in a variety of habitats, but are usually associated with coniferous forests where they roost under exfoliating tree bark. The Project site provides potentially suitable roosting and foraging habitat for this species and the potential for occurrence is considered to be high for foraging and roosting.

Occult Little Brown Bat (*Myotis lucifugus*). The occult little brown bat is a Federal Species of Concern and State Species of Special Concern that is restricted to high-elevation habitats. This species occurs in pine forests at elevations ranging from 6,000 to 9,000 feet above msl. It roosts in buildings, trees, and cliffs and feeds over water or open sites. The Project site provides suitable roosting and foraging habitat and the potential for this species to occur is considered to be high for foraging and roosting.

Fringed Myotis (*Myotis thysanodes*). The fringed myotis is a Federal Species of Concern that is restricted to high-elevation habitats. This species has been observed on Arrastre Creek on the San Bernardino National Forest. It occurs in a wide variety of habitats but is most commonly found in dry pine or mixed conifer

forests and pinyon-juniper woodlands where it will roost in caves, buildings, mine shafts, rock crevices in cliff faces, trees, and bridges. Hibernation has only been documented in buildings and mines. The Project site provides marginally suitable roosting and foraging habitat for this species and potential for occurrence is considered to be moderate for foraging and low for roosting.

Long-legged Myotis (*Myotis volans*). The long-legged myotis is a Federal Species of Concern that is restricted to high-elevation habitats. This species has been observed on Arrastre Creek on the San Bernardino National Forest. It is primarily a bat of coniferous forests but also occurs seasonally in riparian and desert habitats. It uses abandoned buildings, cliff crevices, exfoliating tree bark, and hollows within snags as summer day roosts; caves and mine tunnels for hibernation. The Project site provides marginally suitable foraging and roosting habitat for this species and its potential to occur on the Project site is considered to be moderate for foraging and roosting.

Yuma Myotis (*Myotis yumanensis*). The Yuma myotis is a Federal Species of Concern and a relatively small bat that occurs statewide. This species is closely associated with water and wooded canyon bottoms throughout its range. Caves and old buildings are preferred roosting habitats, with roosts numbering up to 2,000 individuals. The Project site provides potentially suitable foraging habitat for this species and the potential for this species to forage on the Project site is considered to be moderate; however, this species is not expected to roost on the Project site.

Pacific Western Big-eared Bat (*Plecotus townsendii pallescens*). The Pacific western big-eared bat occurs throughout California and is a Federal Species of Concern and State Species of Special Concern. In the southern portion of the state, the subspecies, *P.T. pallescens*, occupies a variety of communities, including oak woodlands, arid deserts, grasslands, and high-elevation forests and meadows. Known roosting sites in California include mines, caves, and buildings. The Project site would provide foraging habitat for this species and it has a moderate potential to forage on the Project site; however, no suitable roosting habitat is present.

ON-GOING REGIONAL AND LOCAL HABITAT CONSERVATION PROGRAMS

Carbonate Plant Critical Habitat/San Bernardino Mountains Carbonate Habitat Management Strategy

On January 23, 2003, the USFWS designated critical habitat for five Federally-listed plants on 13,180 acres of land in the San Bernardino Mountains. The five plants are Cushenbury milk-vetch (*Astragalus albens*), Cushenbury buckwheat (*Eriogonum ovalifolium* var. *vineum*), San Bernardino Mountains bladderpod (*Lesquerella kingii* ssp. *bernardina*), Cushenbery oxytheca (*Oxytheca parishii* var. *goodmaniana*), and Parish's daisy (*Erigeron parishii*). Critical habitat for these species covers 11,980 acres between the western edge of White Mountain and the eastern edge of Rattlesnake Canyon, 685 acres northeast of Big Bear Lake, and 515 acres of San Bernardino National Forest lands on Sugarlump Ridge south of Bear Valley. The project site is not located in any areas designated as critical habitat for these five carbonate plants. In addition, a Carbonate Habitat Management Strategy is currently being developed to address the long-term conservation of carbonate habitat in the

San Bernardino Mountains. The strategy identifies potential and occupied carbonate habitat and actions to conserve carbonate plants. Plant surveys on the project site have not identified any carbonate habitat on the project site that may be subject to conservation measures outlined in the Carbonate Habitat Management Strategy.

County of San Bernardino General Plan

The County of San Bernardino General Plan contains goals and policies/actions designed to preserve biological resources that apply to development within the County's jurisdiction. The general plan contains a list of Rare, Endangered and Threatened species that occur in San Bernardino County, adverse effects on which result in a mandatory finding of significant effect pursuant to State CEQA Guidelines, Section 15065 if individuals are adversely affected by County land use map changes and discretionary land use approvals, thereby requiring the preparation of an Environmental Impact Report (EIR). Listed plant species identified within the General Plan with potential to occur on the Project site include Parish's checkerbloom and bird's foot checkerbloom. Listed wildlife species identified within the General Plan with potential to occur on the Project site include the southern rubber boa and bald eagle. This *Biological Resources Assessment*, contained in Appendix 15.6, has been prepared as supporting documentation for the proposed Project EIR, which satisfies the requirements of the County of San Bernardino General Plan.

County of San Bernardino Biotic Resources Overlay District

The Project site lies within a County of San Bernardino Biotic Resources (BR) Overlay District. The purpose of the BR Overlay District is to "implement General Plan policies regarding the protection and conservation of beneficial rare and endangered plants and animal resources and their habitats which have been identified within unincorporated areas of the county" (Article 2, 85.030201). The County General Plan implements the intent of the BR Overlay District by requiring all proposed land uses with a minimum of 25 percent of the total proposed development area within the BR Overlay District to prepare a biological technical report identifying impacts to biological resources and mitigation measures designed to reduce or eliminate Project related impacts. The *Biological Resources Assessment* is intended to satisfy the requirements of the BR Overlay District.

Plant Protection and Management Ordinance – County of San Bernardino Development Code

The County of San Bernardino requires under Chapter 8, Division 9 of the County Development Code (Plant Protection and Management) that development on all private and public lands within the unincorporated areas of San Bernardino County is subject to specific requirements. Removal of any native plant from unincorporated areas of San Bernardino requires the approval of a removal permit. Additionally, the following sections of the ordinance would apply to native plants on the Project site:

89.0110(b) The provisions of this Division shall not authorize the removal of perch trees within identified American Bald eagle habitat.

89.0115(c) The reviewing authority may require certification from an appropriate tree expert or native plant expert that such tree removals are appropriate, supportive of a healthy environment and are in compliance with the provisions of this chapter.

89.0205 Any coniferous tree or portion thereof, including stumps, shall be treated in accordance with one of the methods specified in Sections 89.0205 and 89.0210 within fifteen (15) days after such a tree or portion of such a tree has been cut.

Migratory Bird Treaty Act (MBTA)

The MBTA established in 1918 the federal prohibition, unless permitted by regulations, to pursue, hunt, take, capture, or kill any migratory bird species or any part, nest, or egg of any such migratory bird species covered by the act. Impacts to any bird (or its nest) listed by the MBTA are considered punishable by fines and/or imprisonment. Additionally, impacts to nesting MBTA-listed species are considered a significant impact by CEQA per guideline section.

IMPACTS

The determination of impacts in this analysis is based on a comparison of maps depicting Project grading limits and maps of on-site biological resources. All construction activities, including staging and equipment areas, are assumed to be contained within the limits of grading. Both direct and indirect impacts on biological resources have been evaluated. Direct impacts are those that involve the initial loss of habitats due to grading and construction. Indirect impacts are those that would be related to disturbance from construction activities (e.g., noise, dust) and use of the Project site.

Biological impacts associated with the proposed Project were evaluated with respect to the following special status biological issues:

- Federally- or State-listed Endangered or Threatened species of plant or wildlife;
- Non-listed species that meet the criteria in the definition of Rare, Threatened, or Endangered in the California Environmental Quality Act (CEQA) Guidelines;
- Streambeds, lakebeds, wetlands, and their associated vegetation;
- Habitats suitable to support a Federally- or State-listed Endangered or Threatened species of plant or wildlife;
- Species designated as California Species of Special Concern or Federal Species of Concern;
- Habitat, other than wetlands, considered special status by regulatory agencies (USFWS, CDFG) or resource conservation organizations; and

- Other species or issues of concern to regulatory agencies or conservation organizations.

The actual and potential occurrence of these resources within the Project site was correlated with the significance criteria noted below to determine whether the impacts of the proposed Project on these resources would be considered significant.

SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines contains the Initial Study Environmental Checklist Form which includes questions relating to biological resources. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this Section. Accordingly, a Project may create a significant environmental impact if one or more of the following occurs:

- If the Project has a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Game and Wildlife Service (refer to Impact Statement 5.8-1).

- If the Project has a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Game and Wildlife Service (refer to Impact Statement 5.8-2).

- If the Project has a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means (refer to impact Statement 5.8-3).

- If the Project interferes substantially with the movement of any native or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedes the use of native wildlife nursery sites (refer to Impact Statement 5.8-4).

- If the Project conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (refer to Impact Statement 5.8-5).

- If the Project conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (refer to Section 10.0, *Effects Found Not to be Significant*).

Section 15065(a), *Mandatory Findings of Significance*, of the CEQA Guidelines states that a Project may have a significant effect on the environment if "…the Project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or

animal community, reduce the number or restrict the range of an endangered, rare or threatened species…".

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would substantially diminish, or result in the loss of, an important biological resource or those that would obviously conflict with local, State or Federal resource conservation plans, goals, or regulations. Impacts are sometimes locally adverse but not significant because, although they would result in an adverse alteration of existing conditions, they would not substantially diminish or result in the permanent loss of an important resource on a population- or region-wide basis.

Section 15380 of CEQA indicates that a lead agency can consider a non-listed species to be Rare or Endangered for the purposes of CEQA if the species can be shown to meet the criteria in the definition of Rare or Endangered. For the purposes of this discussion, the current scientific knowledge on the population size and distribution for each special status species was considered according to the definitions for Rare and Endangered listed in Section 15380 of CEQA.

The actual and potential occurrence of these resources within the Project vicinity was correlated with the previously identified significance criteria to determine whether the impacts of the proposed Project on these resources would be significant.

Additionally, the proposed Project must be consistent with County adopted Standard Conditions of Approval (SCA). Thus, this section identifies the SCAs that would offset the biological impact of clearing existing vegetation types for individual lot development. The majority of the SCAs would be enforced by the County of San Bernardino during the entitlement process and are discussed to demonstrate Project consistency with local and regional policies and plans applicable to the proposed Project. SCAs applicable to the proposed Project include, but are not limited to the following:

SCA-1 Tree replanting will be required on a 2 to 1 basis as per San Bernardino County Plant Protection and Management Ordinance along road cuts and fills. Spacing between planted trees should be no closer than 20 feet. Low volume, fire resistant shrubs and ground cover are also recommended for planting on roadside slopes. A Professional Forester or ISA Certified Arborist with experience in the San Bernardino Mountains should review the landscaping plan before submittal to the County.

SCA-2 The landscape plan shall include tree protection guidelines which state that all construction activities should be limited to the late summer or early fall period. Heavy equipment shall be confined to skid trails, building sites, driveway pads, and parking areas. Heavy vehicle grading over 2 inches, operation, service, storage, placement of fill six inches or deeper, waste disposal, and construction of concrete or asphalt pads shall not take place within the dripline of remaining trees. Utility construction and foundation footings should

also remain outside the dripline (if not possible, consult a professional arborist regarding if roots should be cut, tree removed, or if other preventative measures are possible). All measures should be taken to prevent damage to roots and provide subsequent treatment if injury occurs.

SCA-3 Logs shall be removed from the site within 15 days to reduce the potential for bark beetle infestations. California Forest Practice Rules allow chipping, debarking, sealing with clear plastic for 4 to 6 months, or lopping of limbs from stems greater than 3 inches in diameter and scattering so that all material has maximum exposure to solar radiation. Spraying of individual pine trees with carbaryl insecticide prior to construction is considered advantageous.

Potential impacts are grouped below according to topic. The mitigation measures at the end of this section directly correspond with the numbered impact statements.

SPECIAL STATUS BIOLOGICAL RESOURCES

5.8-1 *Project implementation would affect species identified as special status. Implementation of recommended mitigation measures would reduce impacts to a less than significant level to biological species, with the exception of the Bald Eagle. Impacts to the Bald Eagle are concluded as significant and unavoidable.*

A total of 62.56 acres of native and non-native vegetation types, including developed areas, would be impacted by the proposed project. These areas are discussed below, summarized in Table 5.8-4, *Vegetation Types Impacted* and illustrated on Exhibit 5.8-3, *Biological Resources – Project Impacts*.

Table 5.8-4
Vegetation Types Impacted

Vegetation Type	Existing Acreage	Impacted Acreage
Jeffrey Pine Forest	54.91	54.91
Pebble Plain	0.69	0.69
Lake Shoreline	4.14	4.14
Developed	2.82	2.82
Total	**62.56**	**62.56**

Vegetation Types

Pebble Plains. A total of 0.69 acre of pebble plain habitat would be impacted by Project implementation. Approximately 379 acres of pebble plain are known to exist in the San Bernardino Mountains, 60 percent (227 acres) of which occurs on public

lands. Development of the Project site would remove 0.18 percent of the remaining acreage of pebble plain known to occur on both public and private lands. Although the proposed Project would impact a small area of pebble plain habitat relative to the amount of this vegetation type within the San Bernardino Mountains, Mitigation Measure 5.8-1~~g~~a ~~is recommended to~~ would ensure that impacts are reduced to less than significant levels.

Montane Meadows. Botanical surveys during 2002 were limited on the Project site and throughout southern California due to a very low rainfall year. Many plant species indicative of the montane meadow vegetation type are either annual (i.e., complete their life cycles in a single year and then die) or perennial herbs (i.e., die back to the ground level each year and persist as underground bulbs or rootcrowns). In poor rainfall years, annual and perennial herbs may not be visible, though they may exist on a site as an inactive seed, bulb, or rootcrown. Therefore, the extent of montane meadow on the Project site could not be determined during the 2002 botanical survey. However, implementation of Mitigation Measure 5.8-1a would reduce impacts to this vegetation type to a less than significant level.

Plants

Project implementation would result in impacts on four special status plant species known to occur on the Project site, including one Federally-listed Threatened and CNPS List 1B species, ash-gray Indian paintbrush; and three CNPS List 1B species, Parish's rock cress, Big Bear Valley woollypod, and silver-haired ivesia. Additionally, Project implementation may result in impacts to special status species potentially occurring on the Project site, including six Threatened or Endangered species and 20 CNPS Lists 1B and 2 species. Project implementation also has the potential to impact potentially suitable habitat for 15 CNPS List 4 species.

SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR ON THE PROJECT SITE

One Federally-listed Threatened and CNPS List 1B species, ash-gray Indian paintbrush; and three CNPS List 1B species, Parish's rock cress, Big Bear Valley woollypod, and silver-haired ivesia, were observed on the Project site during the 2002 botanical surveys. Populations of ash-gray Indian paintbrush and Parish's rock cress were found to be widespread throughout an approximately 11.8 acre area of open Jeffrey pine forest with an herbaceous layer of Wright's matting buckwheat in the western half of the Project site. The approximately 0.64 acre of pebble plain habitat was included in this area. Silver haired ivesia was found to be concentrated entirely within the mapped pebble plain habitat. Bear Valley woollypod was found in patches scattered throughout Jeffrey pine forest habitat on the Project site. It is expected that population sizes for these species on the Project site would be larger during a normal rainfall year (i.e., at least 40 percent of average annual precipitation).

Impacts on these species would be considered significant according to CEQA Guideline Section 15065. However, implementation of mitigation measure 5.8-1a would reduce impacts to a less than significant level.

SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING ON THE PROJECT SITE

Botanical surveys during 2002 were limited on the Project site and throughout southern California due to a very low rainfall year. Many plant species are either annual (i.e., complete their life cycles in a single year and then die) or perennial herbs (i.e., die back to the ground level each year and persist as underground bulbs or rootcrowns). In poor rainfall years, annual and perennial herbs may not be visible, though they may exist on a site as an inactive seed, bulb, or rootcrown. Most of the special status plants of the Big Bear area are perennial herbs, making a conclusive determination of "presence" or "absence" based on field surveys difficult during low rainfall years. However, previous reports of presence and determination of habitat quality can be used to estimate the probability that a special status plant species might occur on the Project site.

There is potential for several special status plants on the Project site that were not detectable this spring due to dry conditions. Special status plants potentially occurring on the Project site include the six listed Threatened or Endangered species (bird's foot checkerbloom, San Bernardino bluegrass, California dandelion, Big Bear Valley sandwort, southern mountain buckwheat, and slender-petalled thelypodium); one CNPS List 1B and state-listed Rare species and Candidate for federal listing as Threatened or Endangered (Parish's checkerbloom); and 26 CNPS List 1B or 2 species as follows:

- rock sandwort
- Big Bear Valley milk vetch
- Palmer's mariposa lily
- San Bernardino Mountain owl's clover
- male fern
- San Bernardino Mountains dudleya
- leafy buckwheat
- San Bernardino Mountain gilia
- shaggy-haired alum root
- Parish's alumroot
- short-sepaled lewisia
- lemon lily
- Baldwin Lake linanthus
- San Bernardino Mountain monkeyflower
- purple monkeyflower
- Baja navarretia
- Parish's yampah
- Bear Valley phlox
- Bear Valley pyrrocoma
- San Bernardino butterweed
- prairie wedge grass
- southern jewelflower
- grey-leaved violet

Surveys during a normal rainfall year would be required to determine presence or absence and the extent of these species on the Project site. The loss of potential

habitat for these species would be considered significant according to CEQA Guideline Section 15065. However, implementation of mitigation measure 5.8-1a would reduce impacts to a less than significant level.

There is potential for fifteen CNPS List 4 species on the Project site. The plants in the CNPS List 4 category are of limited distribution or infrequent throughout a broad area in California, and their vulnerability or susceptibility to threat appears relatively low at this time. CNPS is actively monitoring populations of the List 4 species and they will be transferred to a more appropriate list if the degree of endangerment or rarity of these species should change. The CNPS List 4 species present on the Project site do not meet the definitions of Rare, Threatened, or Endangered according to CEQA Guideline Section 15065. However, they are addressed in the *Biological Resources Assessment*, refer to Appendix 15.6, given the number of species potentially present on the Project site. No significant impacts to CNPS List 4 species are anticipated at present.

Wildlife

The proposed Project would result in the loss of potential habitat for several special status wildlife species potentially present on the Project site. For those species expected to occur, potential impacts were evaluated for the habitat that the species is expected to occupy.

Invertebrates. Project implementation may result in impacts on one special status invertebrate species, the Andrews' marble butterfly. Although not observed during general wildlife surveys, the Andrews' marble butterfly has potential to occur on the Project site. Potential habitat for this species is present among plants in the pebble plain habitat on the Project site. However, the Project site contains a minimal amount of habitat relative to the availability of habitat for this species throughout the San Bernardino Mountains. Thus, impacts are considered less than significant.

Amphibians. Project implementation may result in impacts on special status amphibian species. No Federally- or State-listed amphibian species have potential to occur on the Project site. One species that is a Federal Species of Concern and state Species of Special Concern, the yellow-blotched salamander, has potential to occur on the Project site. Potential habitat for this species occurs on the Project site in mesic areas with rotting logs and leaf litter. The loss of potential habitat for this species would be considered less than significant due to the limited amount of habitat loss relative to the availability of habitat for this species in the region.

Reptiles. Project implementation may result in impacts on special status reptile species. One Federal Species of Concern, the southern sagebrush lizard, has been observed on the Project site. Four additional species that are federal Species of Concern and/or State Species of Special Concern have potential to occur on the Project site. These species are the silvery legless lizard, coastal western whiptail, San Bernardino ringneck snake, and San Bernardino Mountain kingsnake. The loss of potential habitat for these species would be considered less than significant due to the limited amount of habitat loss relative to the availability of habitat for these species in the region.

Intensive surveys for the State-listed Threatened southern rubber boa were conducted on the Project site in the spring and summer of 2002. Given the negative results of two independent focused survey techniques and the lack of historical records in the immediate vicinity of the Project site, the survey report concluded that this species is not expected to occur on the Project site. Therefore, no impacts to this species are anticipated.

Birds

Project implementation may result in impacts on special status bird species. Two Federally- and/or State-listed Endangered species have potential to occur on the Project site, the American peregrine falcon and bald eagle. One Fully Protected species, the white-tailed kite, has potential to occur on the Project site. In addition, 16 Federal Species of Concern and/or State Species of Special Concern have potential to occur on the Project site and are discussed below.

Bald Eagle. The bald eagle rarely nests in southern California. However, small wintering populations of bald eagle often occur in scattered montane locations in the region. Big Bear Lake supports the largest wintering population of bald eagle in southern California and may include as many as 30 individuals in peak years. The bald eagle was observed using several trees on the project site for perch and roost locations. A records search also demonstrated that some of the most utilized perch and roost trees on the north shore of the lake are located on the project site. Given the limited distribution of wintering populations of bald eagles in southern California, removal of these trees and/or construction of uses in proximity to trees such that there would be a loss of perching or roosting habitat value for wintering bald eagles would be considered a significant impact. Implementation of mitigation measures 5.8-1b and 5.8-1c would reduce impacts to this species. However, impacts would remain significant following implementation of the recommended mitigation measures.

Cooper's Hawk, Northern Goshawk, Sharp-shinned Hawk, Golden Eagle, Long-eared Owl, Ferruginous Hawk, Northern Harrier, White-tailed Kite, Merlin, American Peregrine Falcon, Osprey, Prairie Falcon, and California Spotted Owl. Project implementation would reduce the amount of foraging habitat for these species. This impact would contribute to the cumulative loss of foraging habitat for these raptor species. However, the loss of potential foraging habitat for these species would be considered adverse, but less than significant due to the limited amount of habitat loss relative to the availability of foraging habitat for these species in the San Bernardino Mountains and National Forest.

The Cooper's hawk, long-eared owl, white-tailed kite, and California spotted owl also have potential to nest on the project site. If an active raptor nest (common or special status species) were found on the project site, the loss of the nest would be considered a violation of the California Fish and Game Code Sections 3503, 3503.5, and 3513. The loss of any active raptor nest occurring on the project site would be considered significant. The potential impact on these species would be reduced to a less than significant level with the implementation of mitigation measure 5.8-1d.

Black Swift, Yellow Warbler, Hepatic Tanager, Purple Martin, and Gray Vireo. Project implementation would reduce the amount of foraging habitat for these species. In addition, the hepatic tanager and purple martin have potential to nest on the project site and implementation of the project may impact active nests. The loss of potential habitat for these species would be considered adverse, but less than significant due to the limited amount of habitat loss relative to the availability of habitat for these species in the San Bernardino Mountains and National Forest. However, impacts to individual nests would result in a violation of the MBTA and would be considered a significant impact. However, implementation of mitigation measure 5.8-1e would reduce impacts to a less than significant level.

Mammals

Project implementation may result in impacts on special status mammal species. No Federally- and/or State-listed species have potential to occur on the Project site. However, 11 Federal Species of Concern and/or State Species of Special Concern have potential to occur on the Project site and are discussed below.

Pallid Bat, Spotted Bat, California Mastiff Bat, Small-Footed Myotis, Long-Eared Myotis, Occult Little Brown Bat, Fringed Myotis, Long-Legged Myotis, Yuma Myotis, and Pacific Western Big-Eared Bat

The proposed Project provides suitable foraging habitat for these bat species. Project implementation would reduce the amount of foraging habitat for these species. The pallid bat, small-footed myotis, long-eared myotis, Occult little brown bat, fringed myotis, long-legged myotis, and Yuma myotis, also have potential to roost on the Project site. This impact would contribute to the cumulative loss of foraging and roosting habitat for these bat species. However, the loss of potential habitat for these species would be considered adverse, but less than significant, due to the limited amount of habitat loss relative to the availability of foraging and roosting habitat for these species in the San Bernardino Mountains and National Forest.

San Bernardino Mountain Flying Squirrel. The Project site provides suitable foraging and breeding habitat for this species. Project implementation would impact habitat for this species. However, the loss of potential habitat would be considered adverse, but less than significant, due to the limited amount of habitat loss relative to the availability of habitat for this species in the San Bernardino Mountains and National Forest.

SENSITIVE NATURAL COMMUNITIES/HABITATS

5.8-2 *The proposed Project would impact portions of the Project site that are habitat for referenced sensitive species. Implementation of recommended mitigation measures would reduce impacts to a less than significant level.*

DIRECT IMPACTS

Flora and Vegetation Type Impacts

A total of 61.87 acres of native and non-native vegetation types, including developed areas, would be impacted by the proposed Project. These areas are discussed below, summarized in Table 5.8-4 and illustrated on Exhibit 5.8-2.

Jeffrey Pine Forest

A total of 54.91 acres of Jeffrey pine forest, including 17.38 acres of open Jeffrey pine forest, would be impacted by Project implementation. Approximately 58,526 acres of Jeffrey pine forest occurs in the San Bernardino National Forest and 141,604 acres in the Cleveland, San Bernardino, Angeles and Los Padres National Forests collectively. Impacts on this vegetation type would be considered less than significant since this vegetation type is common throughout the San Bernardino Mountains and other mountain ranges in the region.

Lake Shoreline

A total of 4.14 acres of lake shoreline would be impacted by Project implementation. Man-made lakes are essentially distinct ecosystems, with an aquatic fauna and flora that bears little resemblance to what naturally occurs in the streams that formed them. Impacts on this vegetation type would be considered less than significant since Big Bear Lake is a man-made reservoir created by the construction of Bear Valley Dam. Montane meadow habitat may occur within the lake shoreline vegetation type. Impacts to montane meadow are discussed above under *Special Status Biological Resources Impacts*.

Pebble Plains

A total of 0.69 acre of pebble plain habitat would be impacted by Project implementation. Impacts to pebble plain habitat are discussed above under *Special Status Biological Resources Impacts*.

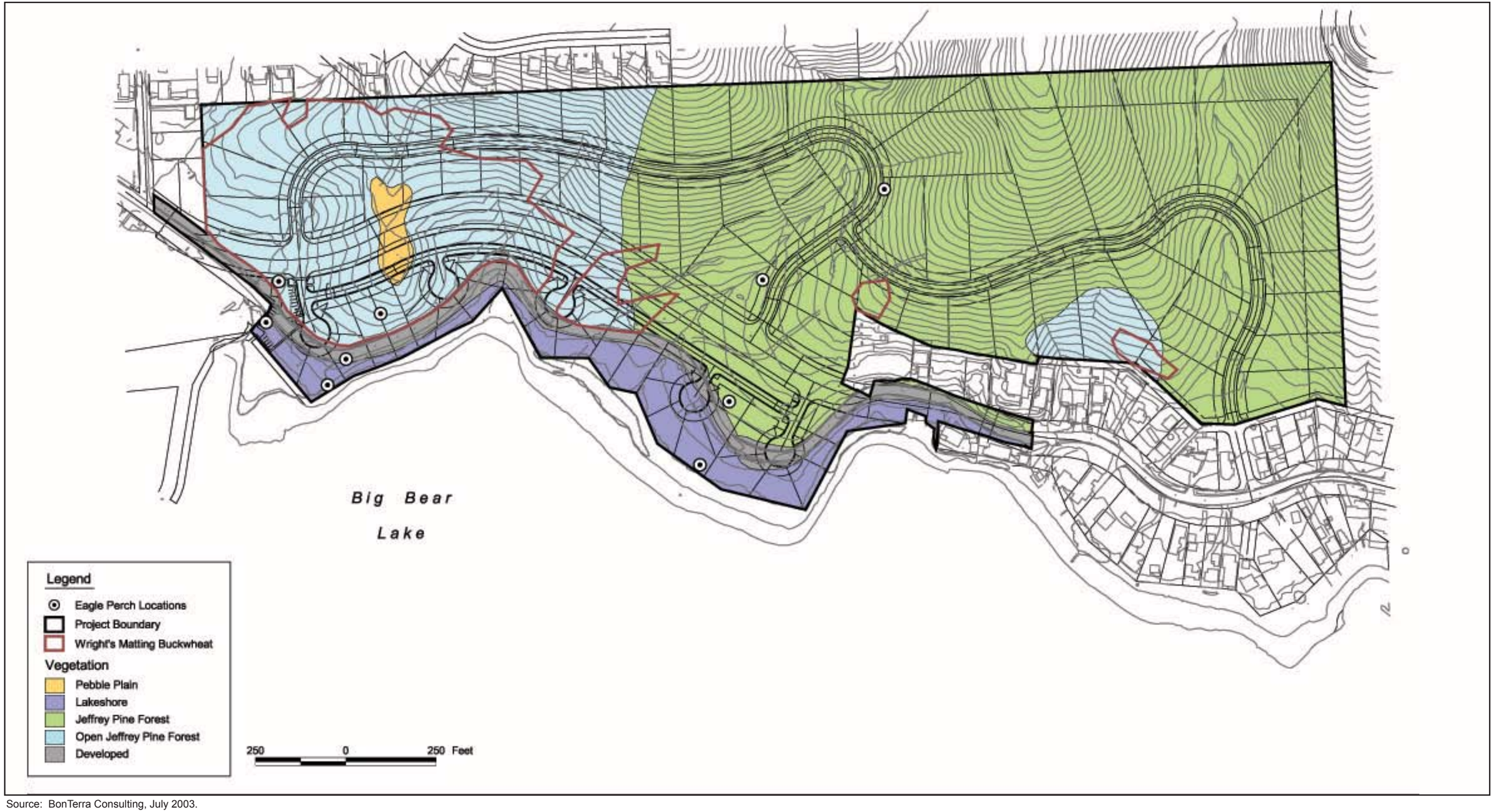
Developed

A total of 2.82 acres of disturbed vegetation in developed areas would be impacted by Project implementation. Impacts on this vegetation type would not be considered significant since this vegetation type is considered to have a low biological value.

WILDLIFE IMPACTS/INDIRECT IMPACTS

Wildlife Impacts

To assess impacts on wildlife, the total impact on a given vegetation type that provides habitat for wildlife was evaluated. Exhibit 5.8-3, *Biological Resources - Project Impacts*, illustrates the vegetation types (i.e., wildlife habitat) that would be impacted as a result of Project implementation. The following discussion of wildlife impacts focuses on the common species occurring on the Project site. Impacts on special status wildlife species are addressed above under *Special Status Biological Resources Impacts*.



Source: BonTerra Consulting, July 2003.

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The loss of habitat, loss of wildlife, wildlife displacement, and habitat fragmentation that would result from construction of the proposed Project would not be considered significant because these impacts would not substantially diminish habitat for wildlife in the region nor reduce any specific wildlife populations in the region to below self-sustaining numbers.

INDIRECT IMPACTS

Indirect impacts are those related to disturbance by construction (such as noise, dust, and urban pollutants) and long-term use of the Project site and its effect on the adjacent habitat areas. The indirect impact discussion below includes a general assessment of the potential indirect affects (noise, dust and urban pollutants, lighting, human activity, and non-native species introduction), of the construction and operation of the proposed Project. Particular focus is placed on the indirect effects on the natural open space area on the Project site collectively referred to as edge effects.

Edge effects occur where development, including roads, takes place adjacent to natural open space areas. Edge effects threaten the ecological integrity, recreational experience, aesthetic quality, public investment, and safety operations of preserved or undeveloped natural areas located adjacent to developed areas. When development is configured in a manner that creates a high ratio of development edge to natural open space, there is an increase in the potential impacts caused by human use (indirect impacts). These indirect effects that address both the short-term construction and long-term use of the Project site are outlined below.

Noise Impacts

Noise levels on the Project site would increase over present levels during and upon completion of construction of the proposed Project. During construction, temporary noise impacts have the potential to disrupt foraging, nesting, roosting, and denning activities for a variety of wildlife species. Upon completion of construction, noise levels on the Project site would increase as a result of increased human activity associated with residential uses. Both short and long-term noise impacts could potentially disrupt the foraging and roosting potential of the site for the bald eagle. Any interruption of the foraging and/or roosting behavior of the bald eagle would be considered a significant impact.

Short-term construction noise impacts on the bald eagle could be avoided by prohibiting grading and construction activities when wintering populations are present (between November and March). However, given restrictions on construction resulting from mitigation for direct impacts (i.e., 5.8-1d and 5.8-1e) construction activities would be limited strictly to the month of October. Consequently, no feasible mitigation could be determined at this time. Therefore, both short- and long-term residential noise impacts on the bald eagle would be considered an unavoidable significant impact of the proposed project.

Increased Dust and Urban Pollutants

Grading activities would disturb soils and result in the accumulation of dust on the surface of the leaves of trees, shrubs, and herbs in the natural open space areas adjacent to the Project site. The respiratory function of the plants in these areas would be impaired when dust accumulation is excessive. These impacts are considered adverse, though less than significant.

Additional impacts on biological resources in the area may occur as a result of changes in water quality. Urban runoff from the proposed Project containing petroleum residues and the potential for improper disposal of petroleum and chemical products from construction equipment (temporary) or infrastructure areas (i.e., vehicles, improper disposal of chemicals) (permanent) could affect water quality on-site and off-site, including Big Bear Lake. This, in turn, could affect populations of aquatic species. Water quality could also be affected by runoff of nutrients from landscape features of the proposed Project. Mitigation would require that the applicant apply for coverage under the State Water Resources Control Board's General Permit for Storm Water Discharge Associated with Construction Activity and comply with all of the provisions of the permit, including the development of a Storm Water Pollution Prevention Plan (which includes provisions for the implementation of Best Management Practices and erosion control measures).

Night Lighting

Lighting of the residential units would inadvertently result in an indirect effect on the behavioral patterns of nocturnal and crepuscular (i.e., active at dawn and dusk) wildlife that are present along the boundaries of the natural areas of the project site. Of particular concern is the effect on small ground-dwelling animals that use the darkness to hide from predators, and on owls, which are specialized night foragers. In addition, the increase in night lighting could discourage nesting and roosting along the lake shore. Most notably, lighting associated with the proposed project could disrupt roosting behavior of the bald eagle on the project site. This increased lighting, in conjunction with the increased noise and habitat loss, would be considered potentially significant. Implementation of mitigation measures 5.8-2a and 5.8-2b would reduce this impact to a less than significant level.

Human Activity

The increase in human activity (i.e., noise, foot traffic) would increase the disturbance of natural open space adjacent to the project site. Human disturbance could disrupt normal foraging and breeding behavior of wildlife remaining in adjacent areas, diminishing the value of these open space habitat areas. Most notably, residential activity associated with the proposed project could disrupt foraging and roosting behavior of the bald eagle on the project site. Implementation of mitigation measures 5.8-2a, 5.8-2b and 5.8-2c would reduce impacts to less than significant levels.

Non-Native Species Introduction

The native habitat types within the natural open space areas adjacent to the project site would be subject to greater pressure from non-native plant species within the developed portions of the project site. Areas that have undergone disturbance generally contain a high number of non-native grasses and forbs that can successfully out-compete the native plants in the region. This will be especially true after initial project grading of the project site. Should non-native plants establish themselves in these areas prior to the establishment of native plant species or non-native/non-invasive plant species in the landscape areas, the non-natives may become invasive in the natural open space areas. Left uncontrolled, these "weeds" may begin encroaching into the adjacent natural areas. These impacts could become significant if uncontrolled. Implementation of mitigation measure 5.8-2d would reduce impacts to a less than significant level.

JURISDICTIONAL WATERS

5.8-3 *Development of the proposed Project ~~does not have~~has the potential to impact jurisdictional waters. Analysis has concluded that potentially significant impacts would be reduced to a less than significant level~~impact would occur in this regard after regulatory compliance~~ with implementation of the recommended mitigation measures.*

Any development proposal that involves impacting the drainages, streams, or wetlands on the site through filling, stockpiling, conversion to a storm drain, channelization, bank stabilization, road or utility line crossings, or any other modification would require permits from the Corps, the RWQCB, and the CDFG before any development could commence on the Project site. Both permanent and temporary impacts are regulated and would trigger the need for permits. Processing of the RWQCB 401 and CDFG 1602 agreement can occur concurrently with the Corps 404 permit process and can utilize the same information and analysis. The Corps will not issue its authorization until the RWQCB completes the Section 401 Water Quality Certification. Applications to both the RWQCB and the CDFG require submittal of a valid California Environmental Quality Act (CEQA) document along with the application.

Mitigation may be required by the regulatory agencies during the permit process. Compensatory mitigation for the loss of jurisdictional function and values is a fundamental component of the applicant regulatory programs. Mitigation can take several forms. It can consist of (1) avoidance or minimization of impacts, (2) compensation in the form or habitat creation, restoration and enhancement, or (3) compensation through participation in a mitigation bank. The first type of mitigation is preferred by the agencies. For any project that impacts jurisdictional areas, it is also preferred by the agencies that compensation through the creation of habitat be performed on-site and in-kind (i.e., riparian woodland for riparian woodland). Conceptual mitigation will be discussed during the Pre-Application Field Meeting with the regulatory agencies. However, the exact requirements of any special permit conditions and mitigation established for this project would be dictated by the regulatory agencies following the review of the formally submitted project applications.

WATERS OF THE U.S. (WETLAND) DETERMINATION

As previously noted, in order to be considered a wetland, an area must exhibit all three of the wetland parameters (i.e., vegetation, soil and hydrology) per the evaluation criteria in the Wetland Delineation Manual. Based on the results of the field investigations, it was determined that not all three parameters were present within the drainages (hydric soils nor riparian vegetation were present). As a result, no Corps wetlands were identified on the Project site and no impacts would occur in this regard.

WATERS OF THE U.S. (NON-WETLAND) DETERMINATION

Based on the results of the field observations and data collection, RBF identified 0.15-acre of Corps jurisdictional "waters of the U.S." within the proposed Project site. The drainages are ephemeral; Big Bear Lake, although not included in the acreage calculation, is also considered jurisdictional by the Corps. Utilizing the most current development plans, it was determined that ~~roadway~~ the proposed improvements would impact approximately 0.2~~0~~4-acre of Corps jurisdiction. Discharges include approximately 0.04-acres to ephemeral drainages and approximately 0.20-acres of impact as a result of fill material associated with the proposed marina.

CALIFORNIA DEPARTMENT OF FISH AND GAME (1602~~3~~) JURISDICTION

Based on the results of the field observations and data collection, RBF identified 0.15-acre of CDFG jurisdictional streambed~~waters~~. Utilizing the most current development plans, it was determined that ~~roadway~~ the proposed improvements would impact 4.38~~0.04~~-acres of CDFG jurisdiction (includes streambed, shoreline, and lake impacts) (refer to Exhibit 5.8-2, *Jurisdictional Map)*.

OVERVIEW OF REGULATORY APPROVAL PROCESS

The following is a summary of the various permits, agreements, and certifications required prior to construction activities taking place within the jurisdictional areas.

Army Corps of Engineers

The Corps regulates discharges of dredged fill materials into "waters of the United States" under Section 404 of the Clean Water Act (CWA). Since improvements associated with the proposed Project would result in the discharge of material within the jurisdiction of the Corps, a 404 permit would be required.

California Department of Fish and Game

~~As noted above, the drainage within the proposed Project area meets the CDFG's definition as streambed and thus would be regulated by the CDFG. An agreement from the Department would be required. The CDFG agreement requires a fee and approximately 45 days processing time.~~ As noted above, areas within the Project site meet the CDFG's definition as streambed and lakebed. Since improvements associated with the proposed project would impact CDFG Jurisdiction, a 1602 Streambed Alteration Agreement (SAA) must be obtained prior to construction. A

processing fee and CEQA c~~C~~ompliance is necessary in order for the Agreement to be issued.

Regional Water Quality Control Board

The RWQCB requires that a CEQA compliance certification be obtained before starting the RWQCB process. Processing time should not exceed 60 days following submission of a complete application (determination of what constitutes a complete application is made by the RWQCB). Additionally, the RWQCB requires that water quality concerns related to urban storm water runoff be addressed. Any 401 Certification application submitted to the RWQCB should incorporate the use of Best Management Practices (BMPs) for the treatment of pollutants carried by storm water runoff in order to be considered a complete application. For the 404 permit to be approved, a 401 water certification would be required. A fee is required as part of the application submittal. Also refer to Section 5.11, *Hydrology and Drainage.*

~~Overall, impacts to the jurisdictional water present on the Project site would be reduced to a less than significant level through cojpliance with the regulatory process (i.e., 404 permit, CDFG agreement, 401 certification.)~~ Implementation of the recommended mitigation measure (Mitigation Measure 5.3-8a) regarding a 3:1 replacement-to-impact ratio for all unavoidable impacts to jurisdictional areas would ensure that significant impacts to jurisdictional waters are reduced to a less than significant level. Compliance with the regulatory process (i.e., 404 permit, CDFG agreement, 401 certification) would ensure the enforcement and implementation of the recommended mitigation measure. It is also noted that additional mitigation requirements may be required through the permitting process depending on the quality of habitat impacted, project design and other factors.

WILDLIFE MOVEMENT

5.8-4 *Project implementation may interfere with the movement of a native resident or migratory wildlife species. Analysis has concluded that impacts are less than significant.*

The development of the project site would not impact wildlife corridors, by definition, but may affect local travel routes. Construction of the residential areas and realignment of Highway 38 would result in reduced connectivity between Big Bear Lake as a water source to the contiguous open spaces on and to the north of the project site. Additionally, construction of the proposed project would result in increased traffic on the project site by residents that would further impede movement of terrestrial wildlife currently crossing the site and Highway 38. Although this impact is considered locally adverse, it is not considered significant because the impact does not substantially affect a regionally important wildlife movement corridor.

REGIONAL AND LOCAL POLICIES/PLANS

5.8-5 *Project implementation would not conflict with adopted regional and/or local policies/plans pertaining to biological resources. Analysis has concluded that impacts are less than significant.*

ON-GOING REGIONAL AND LOCAL HABITAT CONSERVATION PROGRAMS

San Bernardino Valley Multi-Species Habitat Conservation Plan (MSHCP)

The Project site is not encompassed by the draft MSHCP and is not subject to its policies and provisions. Therefore, no conflicts with the policies of the MSHCP are anticipated.

County of San Bernardino General Plan

The project site is located in unincorporated San Bernardino County and is subject to the provisions and policies of the County of San Bernardino General Plan. The General Plan contains a list of species considered Rare, Threatened, or Endangered by the County. Projects potentially impacting County-listed species must prepare an EIR to determine the significance of impacts on these species. Two plant species identified within the General Plan, Parish's checkerbloom and bird's foot checkerbloom, have the potential to occur on the project site. Presence or absence of these species could not be determined on the project site during the 2002 botanical surveys due to a low rainfall year. Therefore, impacts on these species were assessed according to the presence of suitable habitat. Implementation of mitigation measure 5.8-1a would determine specific population impacts and reduce impacts to these species to less than significant levels.

County of San Bernardino Biotic Resources Overlay District

The intent of the BR Overlay District is to require the preparation of a biological technical report for projects within the BR Overlay District identifying impacts to biological resources and mitigation measures designed to reduce or eliminate Project-related impacts. This biological technical report is intended to satisfy the requirements of the BR Overlay District.

Plant Protection and Management Ordinance – County of San Bernardino Development Code

Title 8, Division 9 of the San Bernardino County Development Code contains policies and requirements applicable to the project site including Section 89.0110(a), 89.0115(c), and 89.0205.

Section 89.0110(b) states that the provisions of this Division shall not authorize the removal of perch trees within identified American Bald eagle habitat. Implementation of mitigation measures 5.8-1a and 5.8-1b would ensure the project's compliance with this section.

Section 89.0115(c) requires that the County "may require certification from an appropriate tree expert or native plant expert that such tree removals are appropriate, supportive of a healthy environment and are in compliance with the provisions of this chapter". The Forester's Report and the Botanical Survey Letter Report are intended to satisfy the requirements of this section (refer to Appendix 15.6, *Biological Resources Information*). The County shall make a determination based on the evidence presented herein and in the Forester's Report as to the

significance of the proposed Project impacts to native plants and compliance with the provisions of Division 9 of the County Development Code.

The intent of Section 89.0205 is to treat coniferous tree species such that they don't present a risk of fire, and spread tree insect pests and infection. Compliance with this Section would be enforced by the County standard conditions and requirements during construction of the proposed Project. Implementation of standard condition of approval 3 (SCA-3) would reduce impacts to less than significant levels.

Migratory Bird Treaty Act (MBTA)

Implementation of the proposed project may impact the nests of species covered by the MBTA, including the Cooper's hawk, purple martin, and hepatic tanager. However, implementation of mitigation measures 5.8-1d and 5.8-1e would reduce impacts to these species to a less than significant level.

CUMULATIVE

5.8-6 *Cumulative development in the Project area may impact the area's biological resources. Analysis has concluded that ~~with implementation of the specified mitigation and compliance with all applicable County, State and Federal regulations concerning biological resources, a less than significant impact would occur in this regard.~~project implementation incrementally adding to impacts on bald eagle habitat in the Big Bear Valley would result in a significant and unavoidable cumulative impact to the wintering bald eagle population on Big Bear Lake.*

The proposed project contains some of the most utilized bald eagle roosting and perching habitat in the Big Bear Valley. Construction of the proposed project would diminish the habitat value of the project site for the species. When viewed in conjunction with other past, present, and reasonably foreseeable developments planned for the Fawnskin/Big Bear Lake area, the loss of bald eagle perch and roosting trees on the project site would significantly impact bald eagle habitat on the north shore of Big Bear Lake. Thus, cumulative impacts to the bald eagle are considered significant. Mitigation measures reflective of recommendations developed by scientific studies in the Big Bear Valley, including Kimball Garrett's study on the effects of human activity on wintering bald eagles (1981), are provided as part of the proposed project. However, implementation of these mitigation measures would not reduce direct or cumulative impacts to bald eagle habitat to a level considered less than significant.

~~t~~The loss of Jeffrey pine forest, pebble plain habitat and other native vegetation, as well as the loss of wildlife habitat could be considered a negative cumulative effect. However, with implementation of the recommended mitigation measures cumulative impacts to the Jeffrey pine trees would be mitigated to a less than significant level. ~~The proposed project would impact 0.69 acres of pepple plain habitat, however, implementation of the recommended mitigation measures would ensure that impacts would be reduced to less than significant levels.~~Additionally, implementation of the recommended mitigation measures would reduce impacts to 0.69 acre of pebble plain habitat to a less than significant level.

Potential impacts would be site specific and an evaluation of potential impacts would be conducted on a project-by-project basis. This would be especially true of those developments located in areas that contain sensitive species and habitat. Each incremental development would be required to comply with all applicable County, State and Federal regulations concerning the preservation of biological resources. ~~In consideration of these regulations,~~ However, potential cumulative impacts upon ~~biological resources~~ wintering bald eagle populations would ~~not~~ be considered significant and unavoidable.

MITIGATION MEASURES

Potential impacts to Biological Resources from Project implementation would be addressed through a two-category mitigation program consisting of Standard Conditions of Approval and mitigation measures. The Standard Conditions of Approval are addressed in the impact discussions above. The mitigation measures within each category are described below.

SPECIAL STATUS BIOLOGICAL RESOURCES

SPECIAL STATUS PLANTS AND VEGETION TYPES

5.8-1a ~~Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on listed special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented.~~

~~The project applicant shall pay compensation for the loss of special status botanical resources identified on the project site by the survey by funding the purchase and management of off-site habitat through contributions to a fund established by the California Wildlife Foundation on behalf of the CDFG. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development).~~

~~If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the project applicant is responsible for the mitigation of a minimum of 11.8 acres of pebble plain and open Jeffrey pine forest in the western half of~~

~~the project site that is known to be occupied by the federally-listed Threatened ash-gray Indian paintbrush (i.e., would be required to fund the purchase of 35.4-acres of offsite habitat from the California Wildlife Foundation if the agreed mitigation ratio is 3:1).~~

Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented. Pebble plain habitat acreages will be recalculated following the survey using criteria established by the Habitat Management Guide for Pebble Plain Habitat on the National Forest System (2002).

Should avoidance/retention on-site of the 4.91 acres of Pebble Plain habitat in permanent open space under a Conservation Easement Agreement not occur, the Project Applicant shall pay compensation for the loss of special status botanical resources identified on the project site during the survey by funding the purchase, establishment of a conservation easement, and management of off-site habitat within the conservation easement by an entity approved by the CDFG. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio of 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development). Prior to the initiation of clearing or grading activities on the project site, the conservation easement will be established, the management entity will be approved by the CDFG, and a non-wasting endowment will be established for the monitoring and management of the preservation site by the management entity in perpetuity.

If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the Project Applicant is responsible for mitigating impacts to a minimum of 11.8-acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the Federally-listed Threatened ash-gray Indian paintbrush. As such, the applicant would be required to fund the purchase and maintenance of 35.4-acres of offsite pebble plain and open Jeffrey pine forest habitat that contains special status plant species, including Ash-gray Indian paintbrush and others known to occur on the site.

SPECIAL STATUS WILDLIFE

5.8-1b Trees identified on Exhibits 3 and 4 of the Bald Eagle Survey Report (Appendix E, see attached) as eagle perch locations shall be preserved in place upon project completion and shall not be removed under any circumstances. Any development that may occur within the project site

and in the individual lots must avoid impacts to these trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.

5.8-1c Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed to identify all large trees (i.e., greater than 20-inches in diameter at 4.5 feet from the ground) within 600 feet from the high water line. Trees identified on the project site as having a diameter in excess of 20-inches at four feet from the ground within 600 feet of the shoreline shall be documented and tagged. Any development that may occur within the project site and in the individual lots must avoid impacts to tagged trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.

5.8-1d Seven days prior to the onset of construction activities, a qualified biologist shall survey within the limits of project disturbance for the presence of any active raptor nests. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG.

If nesting activity is present at any raptor nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for raptors in the region of the project site normally occurs from February 1 to June 30. To protect any nest site, the following restrictions on construction are required between February 1 and June 30 (or until nests are no longer active as determined by a qualified biologist): (1) clearing limits shall be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying shall not be allowed within 200 feet of any occupied nest. Any encroachment into the 300/200 foot buffer area around the known nest shall only be allowed if it is determined by a qualified biologist that the proposed activity shall not disturb the nest occupants. Construction during the nesting season can occur only at the sites if a qualified biologist has determined that fledglings have left the nest.

5.8-1e Vegetation removal, clearing, and grading on the project site shall be performed outside of the breeding and nesting season (between March

and September) to minimize the effects of these activities on breeding activities of migratory birds and other species.

5.8-1f The use of the boat dock for motorized boating shall be prohibited between the dates of December 1 and April 1. No motorized boats shall be allowed to launch or moor in the vicinity of the boat dock at any time during this period. This restriction shall be clearly displayed on signage at the entrance to the parking lot and on the boat dock visible from both land and water. This requirement shall also be published in the Homeowner's Association CC&Rs.

~~**SPECIAL STATUS VEGETION TYPES**~~

~~5.8 1g Exterior construction shall be prohibited between the dates of December 1 and April 1 (of each year). Significant impacts to pebble plain habitat can be mitigated to a less than significant level through off-site preservation. The project applicant shall pay compensation for the loss of special status botanical resources identified on the site, by the survey, by contributing to the funding of purchase and management of off-site habitat. The Applicant shall acquire habitat in the Big Bear Valley and dedicate to the CDFG or suitable conservation organization. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development. An area containing no less than 2.1 acres of pebble plain habitat in an area located adjacent to other open space areas within the project vicinity shall be preserved in perpetuity. The preserved areas shall be protected from future development through a conservation easement or other appropriate mechanism.~~

SENSITIVE NATURAL COMMUNITIES/HABITATS

WILDLIFE IMPACTS/INDIRECT IMPACTS

5.8-2a Street lamps on the project site shall not exceed 20 feet in height, shall be fully shielded to focus light onto the street surface and shall avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights shall utilize low color temperature lighting (e.g., red or orange).

5.8-2b Outdoor lighting for proposed homes on the individual tentative tracts shall not exceed 1,000 lumens. Furthermore, residential outdoor lighting shall not exceed 20 feet in height and must be shielded and focused downward to avoid lighting spillover onto adjacent open space or properties. These restrictions on outdoor lighting of the individual

tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This requirement shall also be published in the Homeowner's Association CC&Rs.

5.8-2c To limit the amount of human disturbance ~~to~~ on adjacent natural open space areas, signs shall be posted along the northeastern and eastern perimeter of the project site where the property boundary abuts open space ~~directing people to keep out of the adjacent natural open space areas and to keep dogs leashed in areas adjacent to natural open space areas. This requirement shall be published in the Homeowner Association CC&Rs~~ with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash at all times."

In addition, a requirement stating that residents shall keep out of adjacent open space areas to the north with the exception of designated trails will be published in the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents.

5.8-2d Prior to ~~the issuance of individual building permits, landscaping designs~~ recordation of the final map, a landscaping plan for the entire tract shall be prepared (inclusive of a plant palette) with native trees and plant species, and, shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review shall determine that no non-native or invasive plant species are to be used in the proposed landscaping. The biologist should suggest appropriate native plant substitutes. A note shall be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform with the overall approved tract map landscaping plan. A requirement shall be included stating that residents shall include a restriction of the use of tree and plant species to only native trees/plants approved per the overall tract map landscaping plan, the Homeowner Association CC&Rs shall also restrict (individual lot owners) to use only native tree and plant species approved per the overall tract map landscaping plan.

5.8-2e ~~Garages with automatic door openers shall be required. No exterior construction shall occur between December 1 and April 1, when bald eagles are present~~. Garages with automatic door openers shall be required. No exterior construction, grading or vegetation clearing shall be permitted between December 1 and April 1, which is the wintering period for bald eagles (i.e., the season when bald eagles are present in the Big Bear area).

Also refer to mitigation measures 5.8-1a to 5.8-1f.

JURISDICTIONAL WATERS

5.8-3 ~~No mitigation measures are recommended.~~ Per the direction of the California Department of Fish and Game, all unavoidable impacts to State and Federal jurisdictional lakes, streams, and associated habitat shall be compensated for with the creation and/or restoration of in-kind habitat on-site and/or off-site at a minimum 3:1 replacement-to-impact ratio. Additional requirements may be required through the permitting process depending on the quality of habitat impacted, project design and other factors.

WILDLIFE MOVEMENT

5.8-4 No mitigation measures are recommended.

REGIONAL AND LOCAL POLICIES/PLANS

5.8-5 No mitigation measures are recommended.

CUMULATIVE

5.8-6 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Significant and unavoidable impacts related to Biological Resources have been identified for impacts to Bald Eagle populations. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA.

No additional significant impacts related to Biological Resources have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

5.9 CULTURAL RESOURCES

The purpose of this Section is to identify the potential for cultural resources to occur on the property and to assess the significance of such resources. This Section is based upon the *Historical/Archaeological Resources Survey Report* and the *Paleontological Resources Report* for the Moon Camp Residential Subdivision prepared by CRM in April 2002. Information pertaining to the reports are included in Appendix 15.7. The analysis in this Section has been prepared in accordance with Section 15064.5 of CEQA which considers potential impacts to prehistoric, historic and paleontological resources.

EXISTING CONDITIONS

HISTORICAL RESOURCES

PREHISTORIC CONTEXT

The project area lies in the heart of the homeland of the Serrano Indians, whose traditional territory is centered at the San Bernardino Mountains, but also includes the southern rim of the Mojave Desert, extending from today's Victorville eastward to Twentynine Palms. The name "Serrano" was derived from a Spanish term meaning "mountaineer" or "highlander."

Prior to European contact, the Serranos were primarily gatherers and hunters, and occasional fishers, who settled mostly where flowing water emerged from the mountains. Because of the variation in their habitat, the vegetable staples of the Serrano included both plant foods common in the mountains, such as acorns and piñon nuts, and those common in the desert, such as honey mesquite, yucca roots, mesquite, and cactus fruits. Game animals, including deer, mountain sheep, antelope, birds, rabbits and other small rodents, were hunted with tools and techniques quite similar to those employed by other southern California Indians. Technologically, the Serrano were also similar to their neighbors. Shell, wood, bone, stone, and plant fibers were used in making a variety of implements, such as lavishly decorated baskets, pottery, rabbit-skin blankets, and musical instruments.

The Serrano were loosely organized into exogamous clans, led by hereditary heads, and the clans in turn were affiliated with one of two exogamous moieties. The exact nature of the clans, their structure, function, and number are not known. The Bear Valley, in which Big Bear Lake is located, has been identified to be the territory of the *Yuhaviatam* or *Kuchaviatam* clan, which occupied a village in the vicinity named *Yuhaviat*, meaning "pine place." Some researchers suggest that the Bear Valley was shared between the *Yuhavetum* (*Yuhaviatam*) clan and the *Pervetum* clan.

Although contact with Europeans may have occurred as early as 1771 or 1772, Spanish influence on Serrano lifeways was negligible until 1819, when an *assistencia* under the San Gabriel Mission was established in present-day Redlands, on the edge of Serrano territory. Between then and the end of the mission era in 1834, most of the Serranos in the San Bernardino Mountains were removed to the nearby missions. At present, most Serrano descendants are found on the San

Manuel and the Morongo Indian Reservations, where they participate in ceremonial and political affairs with other Native American groups on an inter-reservation basis.

HISTORIC CONTEXT

In 1772, a small force of Spanish soldiers under the command of Pedro Fages became the first Europeans to set foot in the San Bernardino Mountains, followed shortly afterwards by Francisco Garcés, the famed explorer, in 1776. During the next 70 years, however, the Spanish/Mexican colonization activities in Alta California, which concentrated predominantly in the coastal regions, left little physical impact on the San Bernardino Mountains. Aside from occasional explorations and punitive expeditions against Indian livestock raiders, the mountainous hinterland of California remained largely beyond the attention of the missionaries, the *rancheros*, and the provincial authorities. The name "San Bernardino" was bestowed on the region at least by 1819, when a mission rancho bearing that name was established in the valley lying to the south under the supervision of Mission San Gabriel.

After the American annexation of California in 1848, the rich resources offered by the mountains brought drastic changes to the San Bernardino Mountains, spurred by the influxes of settlers from the eastern United States. Beginning in the early 1850s, the dense forest was turned into the scene—and victim—of a booming lumber industry, which brought the first wagon roads and industrial establishments into the San Bernardino Mountains. In 1860, the discovery of gold in the Bear and Holcomb Valleys ushered in a miniature gold rush, and with it a number of mining towns with several thousand residents. Around the same time, the lush mountain range also attracted cattlemen, sheepmen, and their herds, and within the next two decades gained the reputation of being the best summer grazing land in southern California. Then in 1884-1885, an even more valuable resource in arid southern California, water, became the focus of development in the San Bernardino Mountains when the Bear Valley Land and Water Company created the Big Bear Lake reservoir to ensure the success and prosperity of the Redlands colony.

By the 1890s, excessive logging and sheep grazing in the San Bernardino Mountains had given rise to a forest conservation movement among residents of the San Bernardino Valley to protect the watershed. In 1893, the movement succeeded in 1893, in persuading the U.S. government to create the San Bernardino Forest Reserve, later renamed the San Bernardino National Forest, and over the next few decades effectively brought an end to logging and sheep grazing in the San Bernardino Mountains. In the meantime, the favorable climate, enticing scenery, and the string of man-made lakes gradually propelled the resort industry to the forefront of development burgeoning from the first commercial resort established on the shore of Big Bear Lake in 1888. In 1915, the budding industry received a major boost from the completion of the automobile highway known as Rim of the World Drive. Since then, the San Bernardino Mountains have grown into—and remain—one of southern California's most popular tourism attractions.

The community of Fawnskin, the largest settlement on the north shore of Big Bear Lake, was founded in 1916, at the onset of a great building boom in Bear Valley. In that year, two Los Angeles businessmen, William Cline and Clinton E. Miller, purchased some 700 acres at this location with plans to develop a major resort

surrounded by expensive summer homes. Initially named Grout after Grout Bay, which it overlooks, the community was soon renamed Fawnskin after nearby Fawnskin Valley, which had been known by that name since 1891. The Fawnskin post office was established in 1918, and Cline and Miller's resort was completed the next year. By then, Fawnskin had already grown into a community of more than 100 summer homes, with a string of other resort camps lining the lakeshore to its east. Among these resorts were Moon Camp and Wilsted's Camp, both located in the immediate vicinity of the current project area, as further discussed below.[1]

Records Search

The Archaeological Information Center (AIC) at the San Bernardino County Museum, Redlands, provided the records search service for this study. The AIC is the official cultural resource records repository for San Bernardino County, and a part of the California Historical Resource Information System, established and maintained under the auspices of the Office of Historic Preservation.

During the records search, Robin Laska, AIC Assistant Coordinator, checked the Center's electronic database for previously identified historical/archaeological resources in or near the project area, and existing cultural resources reports pertaining to the vicinity. Previously identified historical/archaeological resources include properties designated as California Historical Landmarks, Points of Historical Interest, or San Bernardino County Historical Landmarks, as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resource Information System.

Historical Research

Historical background research for this study was conducted by CRM on the basis of published literature in local and regional history and historic maps of the project vicinity. Among maps consulted for the research were the U.S. General Land Office's (GLO) land survey plat maps dated 1858 and 1896, and the U.S. Geological Survey's (USGS) topographic maps dated 1899 and 1954. These maps are collected at the Science Library of the University of California, Riverside, and the California Desert District of the U.S. Bureau of Land Management, also located in Riverside.

Field Survey

On March 21, 2002, CRM archaeologists carried out the intensive-level, on-foot field survey of the project area. During the survey, Moreno and Ballester walked the entire project area along parallel north-south transects spaced 15 meters (ca. 50 feet) apart. In this way, the ground surface was systematically inspected for any evidence of human activities dating to the prehistoric or historic periods (i.e., 50 years ago or older). Special attention was paid to animal burrow backdirt, rock outcrops, and unusual natural features. Later, CRM archaeologists revisited the property on April 2, 2002 to complete site recordation of a historic-period refuse scatter discovered during the survey (see “Field Survey Results,” below).

[1] For further discussion of the history of Fawnskin and the San Bernardino Mountains, see Robinson (1989) and LaFuze (1971).

RESULTS AND FINDINGS

RECORDS SEARCH RESULTS

According to records on file at the Archaeological Information Center, a portion of the project area, near its western end, was previously surveyed for cultural resources in 1987, and two prehistoric—i.e., Native American—artifacts were discovered during that survey. The two artifacts which included a groundstone fragment and a chipped stone tool were recorded as an isolate (P36-60758). Since they were found in a deep wash, it was suspected that these artifacts did not occur *in situ* but were rather washed to that location from upper slopes. No other cultural resources studies had taken place in the project area prior to this study, and no other cultural resources had been identified within the project boundaries.

Outside the project area but within a one-mile radius, ten other previous studies have been reported to the AIC. As a result of these and other studies in the vicinity, two archaeological sites have been recorded within the one-mile scope of the records search, and four other possible cultural resources have been reported and, since they have not been formally recorded, designated by the AIC as pending sites. One of the two recorded sites, CA-SBR-4400, consisted of a scatter of chipped stone flakes, and has since been destroyed. The other site, CA-SBR-9937H, was the Miller School House in Fawnskin, a one-room schoolhouse originally built in 1925. The four pending sites were described mainly as scattered chipped stone flakes, projectile point fragments, and/or ceramic sherds, but also included a purported Native American burial ground from the 19th century.

The majority of these previously identified cultural resources were found far enough from the project area not to be a concern for this study. However, P36-60758, is located in the western portion of the project area and the purported Native American burial ground may have been in close proximity to the eastern end of the project area, based on what little information was available at the AIC. These two potential cultural resources, therefore, were among the focal points of the field survey efforts.

HISTORICAL RESEARCH RESULTS

Historical sources consulted for this study indicate that development activities in and around the project area began in the 1910s-1920s, coinciding roughly with the birth of the nearby resort town of Fawnskin. Prior to that, the only man-made feature known to be present in the vicinity of the project area was a road “from San Bernardino to Pine Lake Post Office,” the latter being located in the present-day City of Big Bear Lake. The road skirted around the southern side of the project area, just outside the project boundary, over land that has since been inundated by the lake after construction of the current Big Bear Dam raised its water level in 1911-1912.

In 1915, the completion of Rim of the World Drive, the automobile highway that made the mountain resorts accessible to the “flatlanders”, ushered in a period of phenomenal growth in Bear Valley. Between 1913 and 1921, the number of resorts in the valley mushroomed from 2 to 52. Although the vast majority of them were concentrated on the south shore of the lake, by 1928 at least nine commercial camps or lodges were in operation along the north shore to the east of Fawnskin. Two of

these, Wilsted's Camp and Moon Camp, were evidently located in the immediate vicinity of the project area, and possibly within the project boundaries.

In the 1940s, a large number of buildings was noted in the project area, clustered mostly around the two curves in the highway. While the exact nature of these buildings is not identified in sources consulted during this research, their presence probably attests to the heyday of the resort camps around Big Bear Lake, especially in the midst of the post-WWII prosperity. During the 1950s and the early 1960s, however, rapid advances in modern transportation technology and the resulting shift in American lifestyle began to erode the popularity of such resort camps. Perhaps reflecting that trend, by 1969-1971, the buildings that once occupied the western portion of the project area had disappeared. Since then, all buildings on the property have been removed.

In summary, the results of historical background research suggest that the project area may have hosted one or possibly two of the early resort camps that helped transform Big Bear Lake into the popular playground it is today, and both date to at least the 1920s. The search for possible remains of these camps, thus, formed another focal point of the archaeological field investigations.

FIELD SURVEY RESULTS

No prehistoric sites, features, or artifacts were encountered during the field survey. A diligent effort was made to search for any surface manifestation of the reported Native American burial ground, but none was found. Nor could either of the two prehistoric artifacts noted in the project area in 1987 (P36-60758) be located during the survey. Remnants of picnic sites were observed on the northern side of North Shore Drive, but all were determined to be of recent origin.

In the southeastern portion of the project area, the field survey revealed the presence of a historic-period refuse scatter, which was recorded as an archaeological site and subsequently designated CA-SBR-10635H. The artifact deposit at this location has been heavily disturbed by apparent bottle-hunting activities, and presumably many of the more valuable artifacts have been removed. The remaining artifacts include rusted cans, glass fragments, ceramic sherds, pieces of wood or metal, and other historic-period artifacts mixed with modern trash. Among the more notable items are nine cone-top beer cans, seven solder drop cans, two broken glass bottles, two fragments of an aqua glass insulator, and an old battery. Some of the artifacts, such as the cone-top and solder drop hole-in-cap cans, generally date to the 1930s-1940s, while others, such as the punch-top steel can, may have come from as late as the 1950s-1960s.

Most of the artifacts were found in two concentrations, each centered around a large pit dug recently by bottle hunters. Several more looters' pits have been dug in and around the two larger pits. In all, the pit measures approximately 61 feet along the north-south axis and 49 feet along the east-west axis within the project area, but the refuse scatter extends farther east beyond the project boundaries. In fact, CA-SBR-10635H can be seen as the edge of a much larger refuse deposit located mostly on the adjacent property, around an old structure foundation at that location.

PALEONTOLOGICAL RESOURCES

SETTING

The project area is located in the San Bernardino Mountains, which comprise a portion of the Transverse Ranges geomorphic province, the only east-west trending province in the State of California. This portion of the Transverse Ranges province is bounded by the Peninsular Ranges province on the south, the Little San Bernardino Mountain portion of the Transverse Ranges province to the east, the Mojave Desert province on the north, and the San Gabriel Mountain portion of the Transverse Ranges province to the west (refer to Footnote 1).

The project area lies upon the lower slopes of Delmar Mountain, on the north shore of Big Bear Lake. North Shore Drive (State Route 38) passes through the property. In aerial photographs taken in 1953, 1965, and 1979, the property is shown to be covered by an open forest with ground commonly visible between the trees (aerial photo 1953; 1965; 1979). The 1965 aerial photograph shows nearby Grout Bay to be a mud flat with a wide, exposed shoreline area along the southern edge of the project area.

The portion of the project area north of State Route 38 is wooded to openly wooded, with most of the ground covered by a dense to moderate duff zone composed mainly of pine needles, pine cones, and oak leaves. Surface exposures were limited to roads, steep slopes, canyon bottoms, and a few open meadow-like areas. Large pines, oaks, and cedars make up the bulk of the trees. Also present are buck brush, pinyon pines, sage, cacti, and grasses. The soil is a gravelly sand with scattered to locally dense areas of cobble or small boulder clasts in the surface float. The clasts are mainly quartzite, with only a few scattered granitic clasts. Based on the soil borings and some road cuts, the surface rocky float is probably the result of lag deposits. In other words, the larger rocks are concentrated at the surface as the smaller materials, such as sand, silt, and clay, are eroded away. This side of the highway contains at least three old dirt roads.

The area south of State Route 38 is fenced along the highway, and is accessible through what appears to have been an old, partially graveled driveway. This area has a few scattered large pines, some willows near the shoreline, and is well covered by grasses and weeds. The most open area lies within portions of the access road that are not graveled. The surface soils are a gravelly sand with minor cobble float and only a few scattered small boulders. All but one of the larger rocks are quartzite. Since some buildings are known to have occupied this area in the past, it is possible that the boulders were brought in. The surface level is slightly above the beach during full stands of the lake. Soil borings found that the rock material within the saturated zone is disintegrating, which would suggest that any fossil bone material within this zone would also be disintegrating. The saturated zone should be at or above the lake level, as water tables are usually drawn upward by capillary action to roughly parallel the surface contours of the ground.

The San Bernardino Mountains have been uplifted along the southern edge by the San Andreas Fault and by several steeply reverse dipping faults on the north. These mountains are composed mainly of gneisses, schists, plutonic rocks, and several

kinds of hybrid rocks. They also contain sequences of quartzite and marble from which Paleozoic fossils have been found. The plutonic rocks are mainly of diorite to quartz monzonite to granite in composition and are considered to be Jurassic and/or Cretaceous in age. Both the plutonic and metamorphic rocks are intruded by dikes of aplite, pegmatite, lamprophyre, amphibolite, and fine grained basaltic to rhyolitic rocks. Some Quaternary sedimentary deposits can be found filling canyons and some late Tertiary-Quaternary sedimentary rocks are present along the San Andreas Fault along the south and southwest margins of the range.

The north shoreline of Big Bear Lake includes a strip of Qc, described as the Cabazon fanglomerate of Quaternary age. It is comprised mainly of an unsorted angular to subangular quartzite-rich fanglomerate. The rocks just to the north of the fanglomerates are mapped as the Cactus Granite of Jurassic age.

Another geologic map of the surrounding area shows an east-west fault within the bedrock outcrops just north of the project area. The bedrock is mapped as Precambrian metasedimentary rocks, mainly quartzite, marble, and schist. The rocks between the bedrock and the north shore of Big Bear Lake are shown as Quaternary Alluvium. Except for the fault, geologic mapping shows the same geology for the project area.

A more detailed geologic map of the project area shows most of the property to be designated as “aa” and the upper portions as “rf2m.” The aa is described as alluvium and colluvium that are considered to be deposits on active surfaces. The rf2m is described as dissected, inactive fan gravels still adjacent to the source, considered to be deposits on relict surfaces. While previous mapping shows the rock constituent to be mainly marble, a recent geotechnical study in the same mapped material and near the project area found a large amount of quartzite, rather than marble, to be present. The presence of predominantly quartzite rock material within a gravelly sand at this location was confirmed during the field survey. The surface soils appear to become sandier toward the lake.

The water table was found to be shallow, at 7 to 20 feet, and the rock material within the saturated zone was found to be highly decomposed. The ground water zone, as well as the top of the water table, appears to fluctuate with the lake level. This continued wetting and drying of the rocks material within the ground water zone may be responsible for the noted decomposition of the rock. At depth, all three soil borings encountered sandy clays indicative of ponded sediments. These clays suggest that sometime in the geologic past there was a natural lake occupying the portion of the valley where the man-made Big Bear Lake is now located.

Big Bear Lake is a man-made feature that was built by damming up the headwaters of one of the tributaries of the Santa Ana River as it ran through Big Bear Valley. When the alluvial deposits that once lined the sides and bottom of the Valley were flooded, more recent alluvial deposits began to prograde into the lake. The project area was once on the higher portion of the Valley, in an area of active sedimentation. Such an area would not be a favorable location for the preservation of vertebrate fossil remains, as any animal dying there would have been subject to carnivore feeding and destruction by the movement of coarse rocky material moving down-slope toward the canyon bottom. The decomposing nature of the rock within the

saturated zone would suggest that any fossil material that might have survived within these rocks when they were deposited would have been destroyed along with the rock as they decomposed.

RECORDS SEARCH

The records search service was provided by the Regional Paleontologic Locality Inventory located at the San Bernardino County Museum in Redlands and the Natural History Museum of Los Angeles County in Los Angeles. These institutions maintain files of regional paleontological site records as well as supporting maps and documents. The records search results are used to identify previously performed paleontological resource assessments and known paleontological localities near the project area. In addition, a literature search was conducted using materials in the CRM library and the personal library of the author, including unpublished reports produced from surveys of other properties in the vicinity.

FIELD SURVEY

On March 22, 2002, CRM geologist/paleontologist conducted the field assessment of the project area. The survey was carried out by walking two east-west traverses, north of State Route 38, spaced approximately 50 meters apart and two east-west traverses, south of the highway, spaced approximately 10 meter apart. The results of the survey are incorporated into the sections below.

RESULTS AND FINDINGS

EXISTING DATA SUMMARY

The paleontology record searches conducted by the San Bernardino Museum and Natural History Museum of Los Angeles County indicate that no paleontological localities have been discovered within the boundaries of the project area, or within a one-mile radius of the project area. However, one paleontological locality, approximately five miles to the east, has been previously reported to have produced vertebrate fossils from sediments that could be present in the deeper levels of the current project area. Based on the recent nature of the upper sediments, the San Bernardino County Museum assigns the project area a “low potential to contain significant nonrenewable paleontologic resources,” and states that “no mitigation program is recommended at this time.” The Natural History Museum of Los Angeles County concurs that the upper deposits have low sensitivity for paleontological resources, but points out that excavations in the deeper deposits in the portion of the property north of State Route 38 “may well encounter significant fossil remains.”

The field survey confirmed the presence of recent alluvium on the ground surface. As expected, no fossil remains were found to be present in the project area during the field survey.

IMPACTS

SIGNIFICANCE CRITERIA

The purpose of this study is to identify any potential cultural resources within or adjacent to the project area, and to assist the County of San Bernardino Land Use Services Department in determining whether such resources meet the official definitions of "historical resources," as provided in the California Public Resource Code, in particular CEQA.

According to Public Resources Code Section 5020.1(j), historical resource includes, but is not limited to, "any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California." More specifically, the California Environmental Quality Act (CEQA) Guidelines (Section 15064.5(a) (1-3)) state that the term "historical resources" applies to such resources listed in or determined to be eligible for listing in California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the Lead Agency.

Regarding the proper criteria of historical significance, the CEQA Guidelines (Section 15064.5 (a) (1-3)) mandate that "a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources". A resource may be listed in the California Register if it meets any of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- Is associated with the lives of persons important in our past.
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- Has yielded, or may be likely to yield, information important in prehistory or history (Public Resources Code Section 5024.2 (c)).

According to Appendix G, the Initial Study Checklist, of the CEQA Guidelines, a project would typically have a significant impact on cultural resources if the project would cause one or more of the following to occur.

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5 (refer to Impact Statement 5.9-1);
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5 (refer to Impact Statement 5.9-1);

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (refer to Impact Statement 5.9-2); and/or

- Disturb any human remains, including those interred outside of formal cemeteries (refer to Section 5.9-3).

ARCHAEOLOGICAL/HISTORICAL RESOURCES

5.9-1 *The proposed Project may cause a significant impact to unknown archaeological and/or historic resources visible on-site. Implementation of recommended mitigation measures would reduce impacts to a less than significant level.*

Site CA-SBR-10635H, as stated above, consists of a historic-period refuse scatter. Since many of the artifacts at the site can be dated to the pre-WWII period, it is possible, and probable, that the items were deposited in connection with the early 20th century resort camps known to be in operation in the vicinity. Due to the limited number and types of the artifacts observed, there is insufficient evidence to establish this association conclusively, or association with any persons or events of recognized historic significance. Furthermore, the site constitutes a minor component of a larger historic-period refuse deposit located outside the project area, and its limited information potential is further diminished by extensive disturbances and the intrusion of modern trash. Based on these considerations, the *Historical/ Archeological Resources Survey Report* concludes that Site CA-SBR-10635H, as recorded during this study, does not appear to meet any of the criteria for listing in the California Register, and thus does not qualify as a "historical resource."

Although the field survey effort included a detailed reconnaissance of the site, the potential does exist for subsurface resources to occur and that cannot be visibly detected. This potential impact can be considered significant thus requiring field monitoring mitigation by an archaeologist, qualified and approved by the County during grading and other associated clearing activities. Implementation of mitigation would reduce the significance of potential impacts to a less than significant level.

PALEONTOLOGICAL RESOURCES

5.9-2 *The proposed Project may cause a significant impact to unknown paleontological resources on-site. Implementation of recommended mitigation measures would reduce impacts to a less than significant level.*

The field survey results, supported by literature and subsurface testing, indicate that the project area contains sediments deposited during Holocene time. Vertebrate fossils have been found in these same age sediments approximately five miles east of this location. Geologic studies suggest that these vertebrate fossil remains were found in sediments probably associated with a natural Holocene lake (Baldwin Lake) and not in alluvial sediments associated with alluvial fan deposits.

Previous geologic studies have recorded sands and some gravels at depths greater than five feet in the area north of State Route 38. Based on those findings, and in view of the recent alluvium covering the surface to a depth of five feet and the

ground water saturation situation south of the highway, the *Paleontological Resources Survey Report* concludes that there is a moderate potential for the presence of vertebrate fossils within the project area, north of State Route 38, at depths greater than five feet. Although the field survey effort included a detailed reconnaissance of the site, the potential does exist for subsurface resources to occur that cannot be visibly detected. This potential impact can be considered significant thus requiring field monitoring mitigation by a geologist/paleontologist, qualified and approved by the County, during grading and other associated clearing activities. Implementation of mitigation would reduce the significance of potential impacts to a less than significant level.

BURIAL SITES

5.9-3 *The proposed Project may cause a significant impact to Native American burial sites which could occur on-site. Implementation of the specified mitigation measures would reduce impacts to a less than significant level.*

According to the *Historical/Archeological Resources Survey Report*, records indicate that a Native American burial ground may have been in close proximity to the eastern end of the project area. A diligent field survey effort was conducted to find any surface manifestation of the reported burial ground, however, none was found. Despite the findings of the field survey effort, the potential does exist for human remains to occur and that cannot be visibly detected. This potential impact can be considered significant and would require that all proper notification actions be taken in the event that human remains are discovered during construction/earth-moving activities. Implementation of mitigation would reduce the significance of potential impacts to a less than significant level.

CUMULATIVE

5.9-4 *Cumulative development may adversely affect cultural resources in the north shore area. Resources are evaluated and mitigated on a project-by-project basis.*

The Moon Camp project is located within the north shore of Big Bear Lake. There is limited potential for future development in the project vicinity, assuming that existing US Forest Service owned lands remain undisturbed and undeveloped. Although there is a limited development potential in the north shore area, potential impacts to cultural resources would be evaluated on a site specific, project-by-project basis to ensure that impacts are reduced to less than significant levels. This would be especially true of those developments located in areas considered to have a high sensitivity for cultural (archaeological, paleontological and historical) resources. Each incremental development would be required to comply with all applicable State and Federal regulations concerning preservation, salvage, or handling of cultural resources. In consideration of these requirement and limited amounts of developable land, potential cumulative impacts upon cultural resources would not be considered significant.

MITIGATION MEASURES

The following mitigation measures directly correspond to the identified impact statements in the Impacts discussion.

ARCHAEOLOGICAL/HISTORICAL RESOURCES

5.9-1 Project-related grading, grubbing, trenching, excavations, and/or other earth-moving activities in the project area shall be monitored by a qualified archaeologist. In the event that a material of potential cultural significance is uncovered during such activities on the project site, all earth-moving activities in the project area shall cease and the archeologist shall evaluate the quality and significance of the material. Earth-moving activities shall not continue in the area where a material of potential cultural significance is uncovered until resources have been completely removed by the archaeologist and recorded as appropriate.

PALEONTOLOGICAL RESOURCES

5.9-2a Grading shall be monitored during excavation in areas identified as likely to contain paleontologic resources by a qualified paleontological monitor. Monitoring shall be accomplished for any undisturbed subsurface older alluvium, which might be present in the subsurface. The monitor shall be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments which are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert grading equipment to allow for removal of abundant or large specimens.

5.9-2b Recovered specimens shall be prepared to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.

5.9-2c Identification and curation of specimens into a museum repository with permanent retrievable storage shall occur for paleontological resources.

5.9-2d A report of findings shall be prepared with an appended itemized inventory of specimens. The report shall include pertinent discussion of the significance of all recovered resources where appropriate. The report and inventory when submitted to the appropriate Lead Agency, shall signify completion of the program to mitigate impacts to paleontologic resources.

BURIAL SITES

5.9-3 In the event human remains are discovered during grading/ construction activities, work shall cease in the immediate area of the discovery and the Project Applicant shall comply with the requirements and procedures set forth in Section 5097.98 of the Public Resources Code, including notification of the County Coroner, notification of the Native American

Heritage Commission, and consultation with the individual identified by the Native American Heritage Commission to be the "most likely descendent."

CUMULATIVE

5.9-4 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

No significant impacts related to Cultural Resources have been identified following implementation of mitigation measures referenced in this Section.

5.10 GEOLOGY AND SOILS

The purpose of this Section is to describe the geologic, soil and seismic setting of the project area, identify potential impacts associated with the proposed project, and recommend mitigation measures to reduce the significance of impacts. Information in this Section is based on a geotechnical report for the site prepared by Geologist D. Scott Magorien (dated August, 2002), which includes a site investigation and liquefaction testing program.

The scope of work performed by Mr. Magorien as part of the geology, soils and seismicity portion for the Moon Camp EIR included the following:

- Compile and review relevant reports and maps that address geotechnical, geologic and hydrogeologic conditions for the project and surrounding area. A list of the reports, maps and other relevant data reviewed for this study are presented in the References section of Appendix 15.8.

- A field investigation for this study that included:

  - Reconnaissance-level geologic mapping performed on February 26 and June 20, 2002.

  - Excavation and logging of seven (7) backhoe/test pits on June 20, 2002 to assess near surface soil conditions and bedrock lithology and structure.

  - Drilling, logging and sampling three (3) exploratory rotary wash borings on June 11 and 12, 2002 for the purpose of assessing the presence of potentially liquefiable soils in the vicinity of the lake. During the drilling, Standard Penetration Tests (SPT) were performed every five (5) feet, and samples from each test placed in plastic bags for later soil classification. Applicable well drilling permits were obtained from the County of San Bernardino prior to actual drilling of each of the borings.

- Contacted various individuals who have relevant information concerning the geologic and hydrologic conditions in the area.

Information pertaining to the investigation are provided in this section and Appendix 15.8.

EXISTING CONDITIONS

GEOLOGIC SETTING

The Moon Camp project area is situated within the central portion of the Southern California physiographic province known as the Transverse Ranges Geomorphic Province. This province consists of an east-west trending set of mountain ranges, which include from east to west, San Bernardino, San Gabriel and Santa Inez

mountains. This alignment of youthful mountains owes its existence to ongoing tectonic activity associated with the San Andres Fault system. The geomorphology of the San Bernardino Mountains attests to the youthful nature of this uplifted structural block which is bordered on the north by the North Frontal Fault System, and on the south by the San Andreas fault.

Big Bear Valley is one of a series of east-west trending valleys in the eastern San Bernardino Mountains, believed to have formed largely by both high angle and low angle faults in the region. The valley is considered to be a bedrock enclosed basin filled with more than 500 feet of lucustrine and alluvial sediments derived from the surrounding mountainous areas.

Big Bear Lake, which borders the project area on the south, was created by construction of a dam in 1884 across Bear Creek. In 1912, an 80-foot high multiple-arch dam was constructed to replace the lower older dam. In the late 1980's the Big Bear Lake Dam underwent a seismic retrofit, which included improvement of the foundation conditions beneath the downstream side of the dam. When full, the lake has an area of 2,960 acres, a volume of about 72,200 acre-feet, and a water surface elevation of 6,745 feet.

Topographically, the project area occupies the southernmost margin of a lobe-shaped, south-facing hillside that descends into Big Bear Lake. Natural slopes within the area display surface gradients ranging from 2:1 (horizontal to vertical) along the eastern margin of the site, to approximately 4:1 within the central and western portions, to more gentle gradients near the shoreline of Big Bear Lake. The highest point within the project area is at an elevation of 6,962 feet above mean sea level. Maximum relief between the northern margin of the property and the high water line (i.e., 6,745 feet msl) is approximately 215 feet.

There are two prominent, southerly flowing drainages transecting the project area. Surface gradients within these ephemecal drainage courses average approximately 0.08 foot/foot.

The two major geologic units that comprise the project area include older alluvium of Pliocene-late Miocene age (i.e., 1.5 to 5 million years old), and lesser amounts of Holocene age (present to 11,000 years ago) alluvium that occupies the bottom of the major active stream channels. The older alluvial deposits comprise approximately 90 percent of the project area and extend to the northern shoreline of Big Bear Lake.

Based on a review of published relevant geologic, geotechnical data, as well as the findings from exploratory drilling, excavation of test pits and reconnaissance-level geologic mapping, there appears to be only limited geologic hazards on the property as it relates to site development. Possible geologic/geotechnical constraints to proposed residential development include potential instability of large cut slopes, soil erosion within the two major drainages that transect the property, and possible earthquake-induced seiche along the near shore portions of the site. Although the project area is located within the seismically active region of southern California, there are no documented active or potentially active faults transecting or projecting towards the project area.

GEOLOGIC MATERIALS

Surficial materials within the site consist of topsoil, slopewash materials and recent stream-laid alluvial deposits within the active stream channels. Older alluvial deposits underlie the entire site at relatively shallow depths. The distribution of the more significant deposits is shown on Exhibit 5.10-1, *Geologic Map*. The designations shown below, in parenthesis, correspond to those shown on the geologic map.

TOP SOIL (NOT DESIGNATED ON GEOLOGIC MAP)

Native topsoil which blankets much of the site consists mainly of sandy loam with angular gravel to cobble-size fragments of quartzite derived from older bedrock formations. These soils are typically dry, porous, loose, contain varying amounts of organic material, and range in thickness from approximately eight to ten inches deep. These soils are considered to be moderately erodible in their natural condition and considered too gravelly and cobbley for use as topsoil for landscaping.

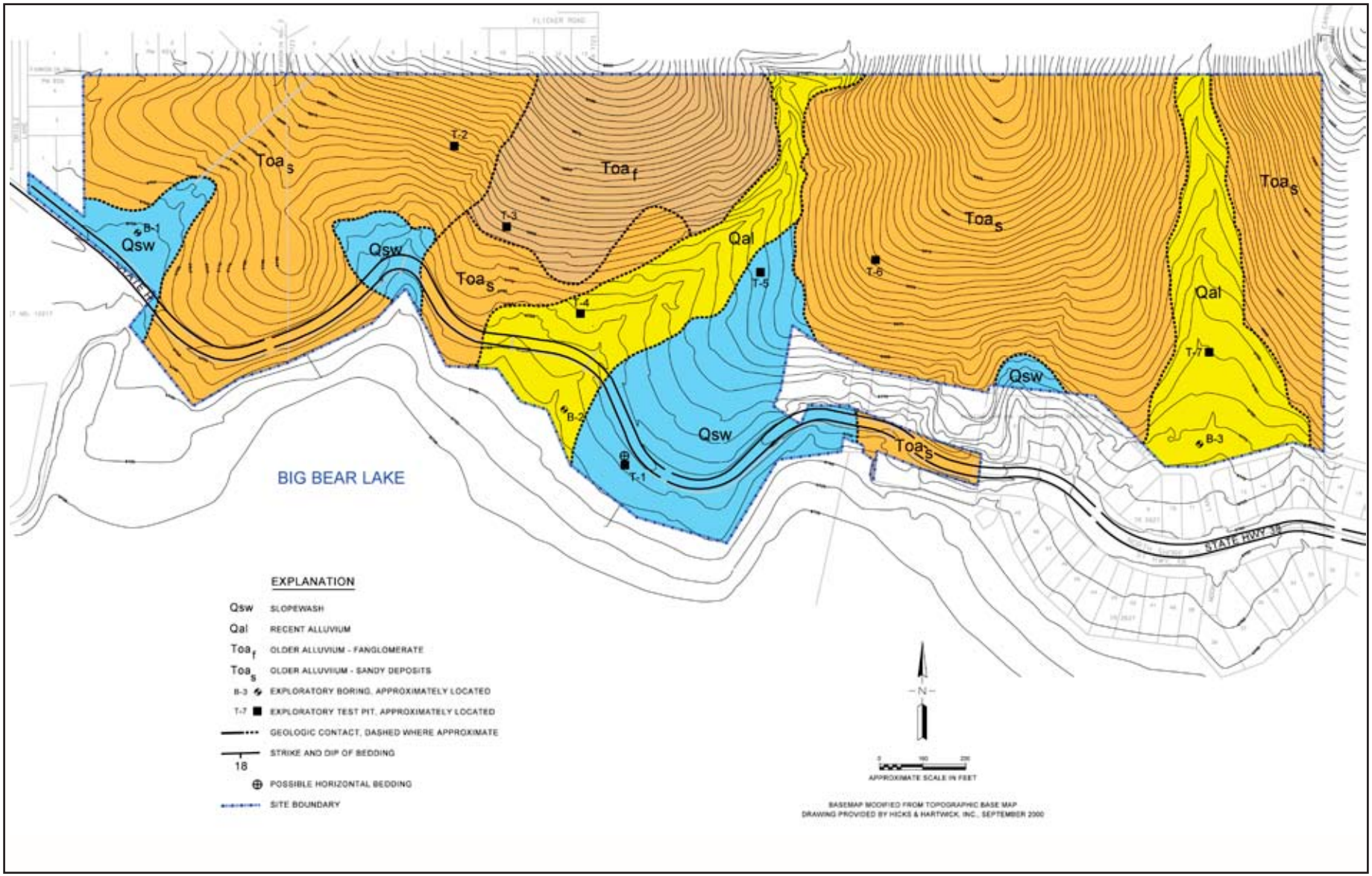
SLOPEWASH (Qsw)

Slopewash deposits consist of the downslope accumulation of eroded topsoil and sediments derived from the underlying older alluvial materials. Slopewash typically contains abundant organic debris and is moderately to highly compressible.

Slopewash occurs within broad drainage swales, and as widespread blanket deposits on the more gentle, natural slope in the south central portion of the area. The compositions of these soil-like deposits reflect the composition of the older alluvial soils from which they are derived. Where observed in the exploratory test pits, slopewash deposits consist largely of an admixture of silty sand, angular gravel to cobble-size fragments of hard, crystalline bedrock. These soils range in thickness from 1 to 4 ½ feet, and are commonly dark brown to dark yellowish-brown in color, loose to medium dense, dry to slightly moist, porous, and contain varying amounts of roots and rootlets, and are considered moderately to highly compressible. Erodibility in their natural state is considered to be slight to moderate.

ALLUVIAL (Qal)

Alluvial deposits occupy the bottom of two major and one minor drainage channels that transect the project area (refer to Exhibit 5.10-1, *Geologic Map*). These Holocene age, soil-like materials have been deposited, eroded and re-deposited by intermittently flowing streams within these drainages. Where encountered in exploratory borings B-2 and B-3, and exploratory test pit TP-7, these soils consist of crudely stratified layers and lenses of silty sand with varying amounts of angular gravel to cobble-size fragments of quartzite and marble. The alluvial soils are dark brown to dark yellowish-brown in color, comprised of fine to medium grain sand, dry to slightly moist, loose and moderately porous and contain numerous roots and rootlets. Where noted in the two borings and the test pit, the thickness of the alluvial soils in the study area ranges from about 3.5 to 17 feet (±). Exploratory boring B-1 encountered only surficial slopewash-type deposits (as described above).



Source: D. Scott Magorien, CEG, Geologic Map, August 2002.

Exhibit 5.10-1

RBF CONSULTING

PLANNING ■ DESIGN ■ CONSTRUCTION

12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Geologic Map

Prior to this investigation, RGS Geosciences' (2001) geologic feasibility study indicated that these alluvial soils near the shoreline of Big Bear Lake are potentially susceptible to seismically-induced liquefaction. Each of these drainages was targeted, as close to the shoreline as considered practical, for exploratory drilling and standard penetration testing (SPT) in three (3) exploratory borings. These borings have been designated B-1, B-2 and B-3, the locations of which are shown on Exhibit 5.10-1, *Geologic Map*.

The primary approach used in this study to assess liquefaction potential of the alluvial soils was based on an empirically based approach as presented by Seed and Idriss (1982). For this approach, SPT blowcounts (e.g. drive energy of a 140 pound weight falling a distance of 18 inches), as well as other seismic and overburden pressures at the point(s) of interest are needed for the assessment. For this study, SPT blowcounts were obtained at approximately every five feet in each of the three rotary-wash borings.

Based on the results of the SPT and visual observations of the soil samples, the recent (i.e., Holocene age) alluvial soils below a depth of approximately eight feet are not considered prone to settlement or seismically-induced liquefaction. The upper eight feet are considered compressible, and are highly erodible. Given the gravelly/ cobbley nature of the near surface alluvium, and the elevation as it relates to high water level in the lake (elevation 6,745 feet msl), the likelihood of seismically induced liquefaction of these sediments along, or inland, of the lakefront is considered remote.

OLDER ALLUVIUM (Toa_s Toa_f)

The entire project area is underlain to significant depths (greater than 400 feet) by what is referred to as Older Alluvium of Plio-Miocene age. These ancient deposits represent what remains of an extensive accumulation of alluvial (stream-laid) soil materials that had been eroded from adjacent bedrock highlands north of the project area. According to geologic mapping by the U.S. Geologic Survey, these alluvial deposits rest unconformably above granitic bedrock of Cretaceous age. Although well dissected, these deposits form an increasingly thickening wedge from north to south. According to water well logs (Geoscience Support Services, Inc., 2000), these sediments are over 400 feet thick near the shoreline and serve as the principal groundwater reservoir beneath the site.

Exposures of the older alluvial deposits are limited to small areas on the road cuts along State Route 38, and on several 12- to 18-foot high road cuts on Polique Canyon Road that leads into Holcomb Valley. No evidence of significant surficial or gross instability was observed either within the project area or along the roadway cuts. Many of these road cuts were quite steep, having inclinations exceeding 45˚. However, the lower portions of these cut slopes were commonly covered with a tallu apron displaying an inclination of approximately 33˚.

In order to evaluate the near-surface lithologic makeup and bedding plane structure of these sedimentary deposits for the purpose of preliminarily assessing slope stability issues, six (6) exploratory backhoe pits were excavated within the property using a rubber-tired, Case 580 extend-a-hoe equipped with a 3 foot wide bucket.

Each of the pits was situated within an area characterized by a certain type of topographic terrain and/or near a proposed cut slope, and varied in depth from approximately two to six feet below ground surface. All the pits were geologically logged and backfilled with the excavated materials. The location of each pit is shown on Exhibit 5.10-1, *Geologic Map*.

The main lithologic character of these ancient soils is represented by layers of clayey sand (labeled Toa_s on the geologic map) that contains varying amounts (up to about 10 percent) of angular, gravel to cobble-size fragments of quartzite derived from older bedrock that now forms discontinuous exposures along the ridgeline to the north of the project area. These older alluvial soils are commonly dark yellowish-brown to strong brown in color, are very dense (i.e., over-consolidated), contain medium to coarse-grained sand particles, and are thinly to thickly bedded. Based on observations within exploratory test pit excavations, these soils were difficult to excavate below a depth of several feet.

Near the north-central portion of the study area the older alluvium is represented by fanglomerate-type deposits. These materials labeled Toa_f (on the geologic map) represent the eroded remnants of an ancient alluvial fan, consisting largely of angular to subangular cobble to gravel size quartzite fragments with approximately 30 percent sitly sand. Similarly to the underlying clayey sand deposits, the fanglomerate is light brownish-yellow, dense, and is difficult to excavate past a depth of about three feet. These deposits appear to have limited area extent, and form a relatively thin verneer atop the more extensive, older clayey sand (Toa_s) deposits.

Overall, there does not appear to be any major geotechnical-related constraints associated with the older alluvial deposits, except perhaps where clay deposits prove to be moderately or highly expansive and where significant cut slopes are planned, as discussed in the Impacts section which follows.

GEOLOGIC STRUCTURE

The geologic structure within the project area is defined by the orientation of bedding planes within the older alluvium (Toa_s). Where observed in the exploratory test pits TP-2 and TP-5, located within the northern portion of the study area, bedding planes exposed near the bottom of each pit varied in strike between North 65˚ West (N65W), and east-west (EW), and dip to the south and southwest at 10˚ and 18˚. In test pit TP-1, located near the shoreline of Big Bear Lake, bedding within the older alluvium appeared to be essentially horizontal. If these bedding plane attitudes are representative of the upland and shoreline areas of the project site, it would appear that the older alluvium has been folded into a roughly east-west trending synclinal fold, the southern limb of which has been eroded away during the formation of Bear Valley. If true, this folding is judged to have occurred over a period of hundreds of thousands of years as a result of San Andreas tectonics. Conversely, this apparent variation in the dip of bedding planes could be a result of ancient faulting associated with uplift of the San Bernardino Mountains. However, no evidence of faulting, active or otherwise, has been documented within or adjacent to the project area.

If these bedding planes observed in the exploratory test pits are representative of the orientation of bedding within areas of the site, south-facing cut slopes associated

with construction for the new alignment for State Route 38, as well as internal streets north of the new highway, could present concerns related to slope stability. If bedding planes near the shoreline area, south of realigned State Route 38, are essentially horizontal (as depicted in test pit TP-1), no such gross slope stability problem would be anticipated. However, where significant cut slopes are planned, a site-specific subsurface investigation should be performed in order to evaluate the nature and extent of bedding planes and the presence of any weak clay layers.

MINERAL RESOURCES

There are no economic metallic or non-metallic ore deposits within or directly adjacent to the project area. The potential for oil and/or gas deposits beneath the site is considered remote.

GEOLOGIC HAZARDS

The primary geologic hazards within the project area are those associated with possible slope instability for new slopes, soil erosion, strong ground motion from earthquakes, and potential seiche along the shoreline.

The project area is situated within the County of San Bernardino Geologic Hazard (GH) Overlay District. For information purposes only, the GH Overlay District was created to provide greater safety by establishing review procedures and setbacks for areas that are subject to potential geologic problems such as ground shaking from earthquakes, liquefaction and subsidence.

FAULTING AND SEISMICITY

Hazards associated with earthquakes include primary hazards, such as ground shaking and surface rupture; and secondary hazards, such as liquefaction, seismically-induced settlement, landsliding, tsunamis, and seiches.

In accordance with the California Department of Conservation Division of Mines and Geology, a fault is a fracture in the crust of the earth along which rocks on one side have moved relative to those on the other side. Most faults are the result of repeated displacements over a long period of time. An inactive fault is a fault that has not experienced earthquake activity within the last three million years. In comparison, an active fault is one which has experienced earthquake activity in the past 11,000 years. A fault which has moved within the last two to three million years, but not proven by direct evidence to have moved within the last 11,000 years, is considered potentially active. No active or potentially active faults are located within or project towards the Project area.

The Project area, like most of Southern California is part of a seismically active region. The Alquist-Priolo Act of 1972 (now the Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code 2621-2624, Division 2 Chapter 7.5) regulates development near active faults so as to mitigate the hazard of surface fault-rupture. Under the Act, the State Geologist is required to delineate “special study zones along known active faults in California”. The Act also requires that, prior to approval of a project, a geologic study be conducted to define and delineate any hazards from

surface rupture. A registered geologist by the State of California, within or retained by the lead agency for the project must prepare this geologic report. A 50-foot setback from any known trace of an active fault is required. The project area is not currently known to be located within an Alquist-Priolo Fault Rupture Hazard Zone, according to the California Division of Mines and Geology.

The Modified Mercalli intensity scale was developed in 1931 and measures the intensity of an earthquake's effects in a given locality, and is perhaps much more meaningful to the layman, as compared to the Richter Scale, because it is based on actual observations of earthquake effects at specific places. On the Modified Mercalli intensity scale, values range from I to XII. The most commonly used adaptation covers the range of intensity from the conditions of "I –not felt except by very few, favorably situate," to "XII – damage total, lines of sight disturbed, objects thrown into the air". While an earthquake has only one magnitude, it can have many intensities, which decrease with distance from the epicenter.

Ground shaking accompanying earthquakes on nearby faults can be expected to be felt within the Project site. However, the intensity of ground shaking would depend upon the magnitude of the earthquake, the distance to the epicenter, and the geology of the area between the epicenter and the property.

A listing of active faults considered capable of producing strong ground motion at the Project site, their distances from the Project site, and the maximum expected earthquake along each fault is presented in Table 5.10-1, *Summary of Fault and Generalized Earthquake Information for the Moon Camp Project Site*. Also presented are generalized evaluations of maximum ground shaking on site for the maximum earthquakes, and generalized predictions of the likelihood of such events occurring.

Table 5.10-1
Summary of Fault and Generalized Earthquake Information for the Moon Camp Project Site

Name	Miles (direction from site)	Maximum Magnitude	Expected Level of Ground Shaking	Likelihood
North Frontal (Western Segmane)	6.5 (north)	7.0	High	Moderate
Helendale	8.0 (east)	7.3	High	Moderate
San Andreas	14 (south)	7.3	High	High
Pinto Mountain	18 (southeast)	7.0	Moderate	Moderate
San Jacinto	25 (southwest)	6.7	Moderate	High

The most severe ground shaking would be expected to accompany a large earthquake on the North Frontal Fault. An earthquake magnitude of 7.0 on this fault could produce Modified Mercallli intensities in the range of VIII to X within the property, and a maximum horizontal ground acceleration between .060 and 1.22 (Hilltop Geotechnical 2001). Damage from ground rupture on-site is extremely unlikely because no known active faults cross the property.

Secondary earthquake hazards, which include liquefaction, ground lurching, lateral spreading, seismically induced settlement, tsunamis, and earthquake induced landsliding, are discussed in the following sections.

Liquefaction

Seismic ground shaking of relatively loose, granular soils that are saturated or submerged can cause the soils to liquefy and temporarily behave as a dense fluid. Liquefaction is caused by a sudden temporary increase in pore water pressure due to seismic densification or other displacement of submerged granular soils. Liquefaction more often occurs in earthquake prone areas underlain by young alluvium where the groundwater table is higher than 50 feet below the ground surface.

The borings conducted for this EIR were drilled in accordance with the "Guidelines for Evaluating and Mitigating Seismic Hazards in California, 1997" published by the Division of Mines and Geology (DMG) of the Department of Conservation. These guidelines are otherwise known as SP 117 (Special Publication 117). The procedures for analyzing liquefaction potential at the site conform to the "Recommended Procedures for Implementation of DMG Special Publication 117" produced by the Southern California Earthquake Center (SCEC) in 1999. Rotary wash drilling techniques were used to advance the borings for this site and Standard Penetration Tests (SPTs) were conducted in general accordance with ASTM D1586. A standard sampler driven by automatic hammer was used to perform the SPTs. Previous measurements by the drilling company rated the hammer energy at 75 to 80 percent. The SCEC recommends the use of the 1985 simplified procedures by Seed and others to analyze liquefaction potential. Typically, the methodology is to determine a corrected blowcount $(N_1)_{60}$ and use a recommended relationship between the corrected SPT blow count and the equivalent uniform cyclic stress ratio necessary to trigger liquefaction during a 7½-magnitude earthquake. For $(N_1)_{60}$ greater than 30, the potential for earthquake-induced liquefaction is practically non existent. Field SPT values were corrected for sampler type, drill rod lengths, hammer type and release system, and overburden stresses to generate the corrected value $(N_1)_{60}$. SPT data for this project show generally high blowcount. Consequently, corrected SPT blowcounts yielded $(N_1)_{60}$ values that were greater than 30.

Based on the results of the SPT data obtained from the exploratory borings, as well as observations within the exploratory test pits, there are no conditions within the project area that could promote liquefaction. Although shallow groundwater is present beneath the shoreline portions of the property, the lithologic character of the older alluvial materials that underlie the entire shoreline area of the project is such that the potential for liquefaction is considered nonexistent.

The only possible exception could be small areas directly at the lake-shoreline interface and the mouth of the major alluvial channels. However, only one of these areas lies within the project area. Given the nature of the lithologic conditions and high SPT blowcounts encountered in exploratory boring B-3 near the mouth of this channel, the lateral extent of any loose, saturated alluvial soils would be very limited. The likelihood of liquefaction-induced impacts in this area is considered low.

Ground Lurching

Certain soils have been observed to move in a wave-like manner in response to intense seismic ground shaking, forming ridges or cracks on the ground surface. Areas underlain by thick accumulations of colluvium and alluvium appear to be more susceptible to ground lurching than bedrock. Under strong seismic ground motion conditions, lurching can be expected within loose, cohesionless solids, or in clay-rich soils with high moisture content. Generally, only lightly loaded structures such as pavement, fences, pipelines and walkways are damaged by ground lurching; more heavily loaded structures appear to resist such deformation. Ground lurching may occur where deposits of loose alluvium exist on the project site, such as within the two major alluviated channels that transect the project area.

Lateral Spreading

Lateral spreading involves the lateral displacement of surficial blocks of sediment as a result of liquefaction in a subsurface layer. As previously stated the liquefaction potential within the project area, however, is considered to be nonexistent.

Seismically Induced Ground Settlement

Strong ground shaking can cause settlement by allowing sediment particles to become more tightly packed, thereby reducing pore space. Unconsolidated, loosely packed alluvial deposits are especially susceptible to this phenomenon. Poorly compacted artificial fills may also experience seismically induced settlement. Unconsolidated soils such as modern alluvial soils within the two active stream channels are subject to seismically induced ground settlement.

Tsunamis

A tsunami is a seismic sea-wave caused by sea-bottom deformations that are associated with earthquakes beneath the ocean floor. The hazard from tsunamis is considered non-existent, given the large distance from the Pacific Ocean.

Seiching

Seiching involves an enclosed body of water oscillating due to groundshaking, usually following an earthquake. Lakes and water towers are typical bodies of water affected by seiching. Because of the proximity of the subject site to Big Bear Lake, the site is susceptible to damage from seiching. The largest amplitude of ground motion associated with a seismic event in this area is anticipated to be related to a major earthquake along the North Frontal Fault zone.

Other Geologic Hazards

Landslides. No landslides are known to exist within the upgradient of the site. Field reconnaissance did not disclose the presence of older, existing landslides within or near the subject property. Aerial photographic analyses performed as part of this study also did not disclose any existing landslides or slumps in the project area.

IMPACTS

SIGNIFICANCE CRITERIA

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains the Initial Study Environmental Checklist form used during preparation of the project Initial Study as contained in Appendix 15.1 of this EIR. The Initial Study includes questions relating to geology, soils and mineral resources. The issues presented in the Initial Study Checklist have been utilized as thresholds for significance in this Section. Accordingly, a project may create a significant environmental impact if one or more of the following occurs:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Section 10.0, *Effects Found Not to be Significant*);
  - Strong seismic ground shaking (refer to Impact Statement 5.10-3);
  - Seismic-related ground failure, including liquefaction (refer to Section 10.0, *Effects Found Not to be Significant*);
  - Landslides (refer to Section 1.0, *Effects Found Not to be Significant).*

- Result in substantial soil erosion or the loss of topsoil (refer to Impact Statement 5.10-2);

- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse (refer to Impact Statement 5.10-1);

- Be located on expansive soils, as defined in Table 18-1 B of the Uniform Building Code (1994), creating substantial risks to life or property (refer to Impact Statement 5.10-5); and/or

- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater (refer to Section 10.0, *Effects Found Not to be Significant*).

Potential impacts associated with the project area's topography, soils, and the region's seismic activities are identified below. Mitigation measures are provided to reduce the significance of impacts.

The level of geotechnical and landform information contained herein is adequate to analyze the potential project effects on earth resources and landforms, and to determine appropriate mitigation measures. For certain items, the project geotechnical engineer should perform further testing and review of on-site conditions as part of the final design work. This additional work will further refine details for site

design, but is not anticipated to alter the conclusions of significance contained herein. In accordance with CEQA case law, this later additional refinement is not a deferral of mitigation. Rather, it is a design refinement, consistent with the commitment to mitigation included in this EIR.

The conceptual grading plan prepared by Hicks and Hartwick, Inc. (dated 6/6/01) indicates the creation of numerous, southerly-facing, 2:1 (horizontal to vertical) cut and fill slopes adjacent to the realigned portion of State Route 38 and the two (2) roadways internal to the development. Based on the nature of bedding planes observed within the older alluvial deposits in test pits TP-2 and TP-5, southerly-facing cut slopes north of the realigned section of State Route 38 may be grossly unstable. If so, the lots adjacent to these cut slopes could be significantly impacted.

There are also a number of other short- and long-term impacts to the current physical/geological setting that can be generally expected from grading and development activities. These are described in the following impacts sections.

Based on the results of the data obtained from the exploratory boring and test pits, liquefaction is not considered to be a significant impact due to the nonexistent potential within the project site.

The most significant potential impacts to site development would be caused by changes in existing topography, erosion of surficial soil deposits, ground shaking from nearby seismic sources, and potential seiche along the shoreline properties. Impacts to the existing groundwater conditions beneath the site may include increased amounts of recharge to the underlying aquifer(s) as a result of widespread landscape irrigation or leaky buried water transmission lines. As stated in Section 5.11, *Hydrology and Drainage*, of this, EIR, if groundwater from on-site water wells are to provide the water supply to the project area, additional studies will be necessary to assess the impacts to the underlying aquifer as a result of groundwater withdrawals.

SLOPE STABILITY

5.10-1 *Development of the proposed Project could result in slope failures. Implementation of the recommended mitigation measures and compliance with the County Development Code and Uniform Building Code would reduce impacts to less than significant levels.*

Given the apparent southerly inclination of bedding planes within the older alluvial deposits, proposed of south-facing, manufactured cut slopes could be grossly unstable. If weak clay layers within the older alluvium were found to be dipping out-of-slope, in what is referred to as “daylighted bedding”, slope failures could occur and encroach into adjacent lots.

Methods to mitigate such conditions could include to construction of 2:1 (horizontal to vertical) buttressed slopes using on-site native soil materials, or constructing geotextile-reinforced soil buttresses where cut slopes are planned. Either of these methods, as well as a number of other forms of proven slope reinforcement methods would reduce this impact to a less than significant level.

SOIL EROSION

5.10-2 *Development of the proposed Project could result in accelerated soil erosion. Project compliance with the County Development Code, the Uniform Building Code and the recommended mitigation measures would reduce impacts to a less than significant level.*

The younger alluvial deposits within the two major stream channels are highly erodible. Adverse surface drainage could promote accelerated soil erosion which could undermine proposed structures and lead to increased sedimentation within Big Bear Lake. This impact would be considered significant if not mitigated.

Mitigation measures, such providing adequate surface drainage away from these soils or covering them with a roadway, would reduce this impact to a less than significant level.

GROUND SHAKING

5.10-3 *Development of the proposed Project may increase the number of people/structures exposed to effects associated with seismically induced ground shaking. Implementation of the recommended mitigation measures and compliance with the County Development Code and the Uniform Building Code would reduce potential impacts to less than significant.*

Given the highly seismic character of the Southern California Region, moderate to severe ground shaking can be expected within the project area due to moderate to large earthquakes on the nearby North Frontal, Helendale, or San Andreas fault zones. This impact would be considered significant if not mitigated. In order to reduce this impact a less than significant level, all structures for human occupancy should be constructed in accordance with seismic design standards set forth in the latest edition of the Uniform Building Code.

SEICHE

5.10-4 *Development of the proposed Project may expose people/structures to seiching as a result of significant ground motion related to an earthquake. Project compliance with recommended mitigation measures would reduce impacts to less than significant levels.*

Seiche-induced run-up along the shoreline properties adjacent to Big Bear Lake could conceivably occur due to significant ground motion from a major earthquake. The amount of potential run-up would be dependant on the inclination of the near-shore environment and the height of the lake level at the time of the seismic event. Assuming the lake would be at its highest level during such an event, mitigation measures involving at least 5 feet of “free-board” above the high-water line for all residential structures would reduce this impact to a less than significant level.

EXPANSIVE SOILS

5.10-5 *Development of the proposed Project may create substantial risks to life or property as a result of expansive soils. Implementation of the recommended mitigation measure would reduce impacts to less than significant levels.*

Currently, there is insufficient information concerning the expansive nature of the alluvial soils beneath the project site. This impact will need to be evaluated in ~~additional~~ design level geotechnical analysis/studies~~.~~, which include ~~1)~~ a quantitative geotechnical analysis~~,~~ ~~2), a design level geotechnical engineering report,~~ and ~~3)~~ a design-level engineering geology report. Implementation of the recommended mitigation measures ~~of~~ from the design-level geotechnical engineering report ~~the recommended mitigation measure and conclusions rendered in the referenced reports~~ would reduce impacts to less than significant levels.

CUMULATIVE

5.10-6 *The proposed Project, combined with future development, may result in increased short-term impacts such as erosion and sedimentation, and long-term seismic impacts within the area. Mitigation is incorporated on a project-by-project basis to reduce impacts to a less than significant level in areas deemed suitable for development.*

Soils and geologic conditions in the Project vicinity may vary by location. Short-term cumulative impacts such as erosion and sedimentation would occur. The only cumulative long-term impact related to geology is the exposure of people and the property in the vicinity of the North Frontal Fault System to the potential for seismically induced ground shaking. Implementation of the cumulative projects would incrementally increase the number of people and structures potentially subject to a seismic event. Such exposure can be minimized by adhering to UBC standards and requirements. The cumulative effects of increased seismic risk would be addressed on a project-by-project basis in order to determine the need for project specific mitigation.

MITIGATION MEASURES

This section directly corresponds to the identified Impact Statements in the impacts subsection.

SLOPE STABILITY

5.10-1 The stability of ~~S~~south facing cut slopes shall be analyzed as part of the design-level geotechnical investigation. ~~u~~Utilize~~e~~ing 2:1 buttressed slopes using on site native soil materials, or ~~by~~ constructing geotextile-reinforced soil buttresses ~~where~~for planned unstable cut slopes ~~are planned~~ are typical engineering designs for stabilizing slopes. Either of these methods, or other methods must be approved by the San Bernardino County Department of Building and Safety~~Geologist for slope reinforcement may be utilized~~.

SOIL EROSION

5.10-2a Due to the potential for erosion associated with younger alluvial deposits within the two major on-site stream channels, increased surface drainage quantities associated with development on-site shall be directed away from the stream channels.

5.10-2b Prior to the issuance of Grading Permits, the Project Applicant shall prepare a Soil Erosion and Sedimentation Plan for submittal and approval by the County Building and Safety Department.

GROUND SHAKING

5.10-3 Engineering design for all structures and roadways shall be based on the current California Uniform Building Code at the time of project development. Construction plans shall be in accordance with seismic design standards set forth by the County's Development Code and Uniform Building Code.

SEICHE

5.10-4 Residential structures shall be located in areas which provide a minimum of five feet of freeboard above the high water line for any structures.

EXPANSIVE SOILS

5.10-5 Prior to grading permit issuance, ~~geologic analysis/studies shall be required including 1) a~~ a quantitative geotechnical analysis and~~of liquefaction, 2) a~~ design-level geotechnical engineering report shall be required and submitted to the County of San Bernardino Department of Building and Safety for their approval. ~~and 3) a design level engineering geology report.~~

CUMULATIVE

5.10-6 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

No significant impacts related to Geology and Soils have been identified following implementation of mitigation measures and/or compliance with applicable standards, policies and/or County of San Bernardino Development Code and standards set forth in the Uniform Building Code.

5.11 HYDROLOGY AND DRAINAGE

This Section analyzes potential impacts on existing drainage patterns and flood control facilities in the Project area, as well as the potential effects on the groundwater and water quality in Big Bear Lake. Mitigation measures are recommended to reduce potential impacts to a less than significant level. Information in this Section is based on the Hydrology and Water Quality Report for the Project site prepared by RBF Consulting (June 2002), hydrological data made available by Hicks & Hartwick, Inc., the Geohydrologic Investigation of the Moon Camp Area (GSS 2000 report), prepared by Geoscience Support Services, Inc. (GSS) (July 2000), the Focused Geohydrologic Evaluation of the Maximum Perennial Yield of the North Shore and Grout Creek Hydrologic Subunit Tributary Subareas (GSS 2003 report), prepared by GSS (December 2003) and the Delineation of Jurisdictional Waters, prepared by RBF Consulting (July 2004).

EXISTING CONDITIONS

The purpose of this existing conditions evaluation is to establish a baseline for comparison of the pre-project and the post-project conditions. Baseline conditions investigated include: land use, hydrology, floodplain mapping, groundwater and surface water quality.

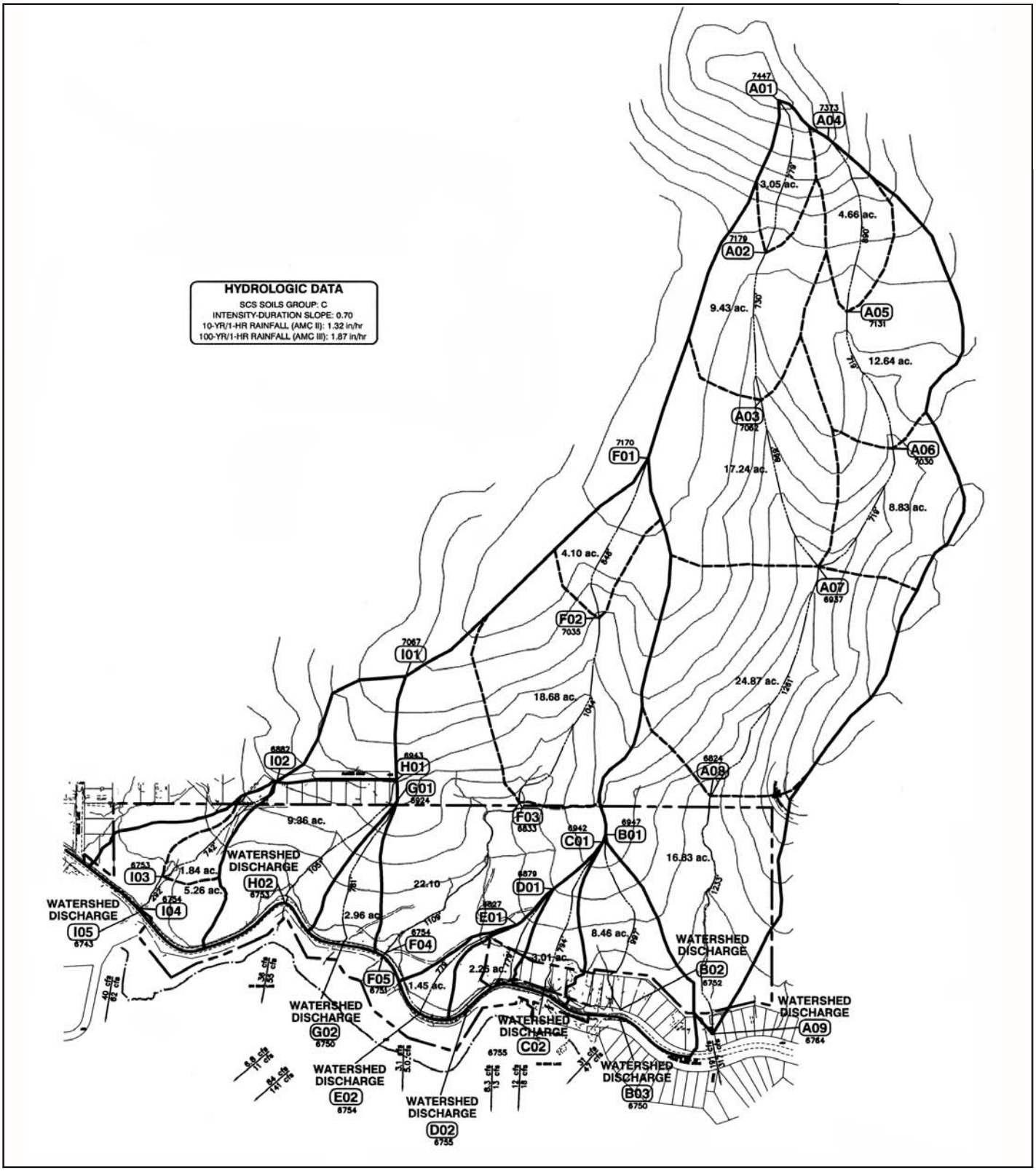
The watershed tributary to the site can be separated into nine drainage areas consisting of approximately 177 acres. Flows enter Big Bear Lake via cross culverts under State Route 38 and direct sheet flow over State Route 38. The drainage areas are labeled A through I. Area A, located on the eastern end of the site, contains a natural channel passing through the proposed development site. It is the largest drainage area consisting of 98 acres.

HYDROLOGY

Hicks & Hartwick, Inc. conducted a hydrology analysis that provides the basis for the existing condition hydrology for the Project site. Hydrologic calculations utilized to evaluate surface runoff from the 10-year and 100-year hypothetical design storm frequencies of tributary drainage areas were performed using Advances Engineering Software 1983-1994 (AES). The computer software (AES) creates an inactive watershed system to compute hydraulic and hydrological information for a given watershed. The watershed subarea boundaries were delineated in their *Preliminary Drainage Study*. Hydrologic parameters used in the analysis, such as rainfall and soil classification, are presented in the *San Bernardino County Hydrology Manual* dated May 1983. Exhibit 5.11-1, *Existing Condition Hydrology Map*, illustrates the hydrology for the existing condition.

EXISTING WATERSHED DESCRIPTION

The historic drainage pattern for the area follows the natural topography, north to south with the flow outleting to Big Bear Lake.



Source: Hicks & Hartwick, Inc., Preliminary Drainage Study.

Not to Scale

RBF CONSULTING

PLANNING ■ DESIGN ■ CONSTRUCTION

12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Existing Condition Hydrology Map

Exhibit 5.11-1

The maximum elevation differential of the watershed is approximately 213 feet (from elevation 2,960 at the northeast boundary to 2,747 feet at the lakefront). The site has slopes of five to 40 percent. Due to on-site drainage patterns, the project site was divided into nine areas (A through I). Area "A" is on the eastern portion of the watershed and area "I" is on the western portion. Table 5.11-1, *Drainage Area Breakdown*, provides further detail on the nine existing drainage areas and subareas.

Table 5.11-1
Drainage Area Breakdown

Drainage Area	Area (acres)	Number of Subareas
A	95.4	8
B	8.5	1
C	3.0	1
D	2.3	1
E	1.5	1
F	44.9	3
G	3.0	1
H	9.4	1
I	11.4	3

All soil types are classified into four hydrologic groups (A, B, C and D). Soil type A has low runoff potential and consists primarily of sand and gravel. Soil type B has a moderate infiltration rate and consists mostly of sandy-loam soils. Soil type C has a slow infiltration rate and consists primarily of silty-loam soils. Soil type D has a high runoff potential and consists of clay soils.

Area "A" is composed of 8 subareas. Currently all land in area "A" is natural. There is a natural channel running down the center of watershed "A". Approximately 50 percent of the land on the north end of sub-watershed "A" is composed of soil type "D", while the remainder is composed of soil type "C". Area "B" is composed of one subarea. Area "B's" land use consists of 1.0 dwelling unit per acre (DU/AC). Areas "C", "D", and "H" are all composed of one subarea. Within these subareas, the land use consists of 1.0 DU/2.5 AC. Areas "E" and "G" are also composed of one subarea each. These subareas exist as natural lands. Area "F" is composed of three subareas. The entire drainage area is comprised of natural lands. Area "I" is composed of three subareas. In the upper drainage area, the land use consists of 4.0 DU/AC. In the second drainage area, the land use consists of 1.0 DU/2.5 AC. The downstream drainage area in subarea "I" consists of natural lands.

RBF observed that the existing culverts which cross State Route 38 were either plugged with sediment, had crushed inlets, or both. These deficiencies result in little to no capacity in the existing culverts. The deficiencies cause ponding and overtopping of State Route 38.

RATIONAL METHOD

Hicks & Hartwick performed the hydrologic calculations to determine the 10-year and 100-year peak flow rates using the *San Bernardino County Hydrology Manual* dated May 1983. The Rational Method is an empirical computation procedure used for developing a peak runoff rate (discharge) for storms of a specific recurrence interval. The design discharges were computed by generating a hydrologic "link-node" model, which divides the area into drainage subareas. These subareas are tributary to a concentration point or hydrologic "node" point determined by the existing terrain and street layout. The assumptions/guidelines applied for use of the Rational Method are included in Appendix 15.9, *Hydrology Data*.

EXISTING CONDITION SURFACE WATER HYDROLOGY

To establish the baseline hydrologic conditions for the Project, both 10-year and 100-year frequency storm were analyzed by Hicks & Hartwick. The flows for the 10-year storm are used to determine local storm drain sizing, while the 100-year analysis is used for larger master plan facilities and floodplain mapping. The predominant hydrologic soil classification of the natural watershed is soil type "C" and "D", which corresponds to a high runoff potential, with the soil having slow infiltration rates consistent with clay soils. Table 5.11-2, *Existing Conditions Peak Flowrates*, summarizes the results of the existing condition analysis utilizing the 1983-1994 Advanced Engineering Software.

FLOODPLAIN MAPPING

The County of San Bernardino is a participant in the National Flood Insurance Program (NFIP). Communities participating in the NFIP must adopt and enforce minimum floodplain management standards, including identification of flood hazards and flooding risks. Participation in the NFIP allows communities to purchase low cost insurance protection against losses from flooding. The published Flood Insurance Rate Maps (FIRMs) for the Project site are included on Community Panel Number 060270 7295B. The FIRMs indicated that there are no existing flood hazards within the Project site.

JURISTICTIONAL WATERS

RBF Consulting conducted a Delineation of Jurisdictional Waters (July 2004). The findings of their Study are summarized below.

WATERS OF THE U.S. (WETLAND) DETERMINATION

In order to be considered a wetland, an area must exhibit all three of the wetland parameters (i.e., vegetation, soil and hydrology) per the evaluation criteria in the Wetland Delineation Manual. Based on the results of the field investigations, it was determined that not all three parameters were present within the drainages (neither hydric soils nor riparian vegetation were present). As a result, RBF identified no Corps wetlands on the proposed Project site.

Table 5.11-2
Existing Conditions Peak Flowrates

Subarea	Area (acres)	Total Area (AC)	Tc (min)	Total 10-Yr. Peak Q (cfs)	Total 100-Yr. Peak Q (cfs)
Watershed A					
A1 – A2	3	3	16.6	7.8	12.2
A2 – A3	9.4	12.5	17.4	30.3	48.4
A3 – A7	17.2	29.7	18.3	69.0	111.0
A4 – A5	4.7	4.7	18.4	11.0	17.4
A5 – A6	12.6	17.3	19.2	39.4	62.5
A6 – A7	8.8	26.1	20.0	57.4	91.6
A7 – A8	24.9	79.0	19.6	170.1	227.3
A8 – A9	16.8	95.9	21.2	191.5	317.3
Watershed B					
B1 – B2	8.5	8.5	10.3	31.1	47.3
Watershed C					
C1 – C2	3.0	3.0	9.4	11.7	17.9
Watershed D					
D1 – D2	2.3	2.3	10.0	8.3	12.8
Watershed E					
E1 – E2	1.5	1.5	19.9	3.1	5
Watershed F					
F1 – F2	4.1	4.1	20.0	8.6	14.1
F2 – F3	18.7	22.8	21.1	45.6	75.2
F3 – F4	22.1	44.9	22.5	84.4	141.1
Watershed G					
G1 – G2	3.0	3.0	18.1	6.7	10.9
Watershed H					
H1 – H2	9.4	9.4	9.6	35.7	54.6
Watershed I					
I1 – I2	4.3	4.3	9.4	17.3	25.7
I2 – I3	1.8	6.1	10.2	22.9	34.7
I3 – I4	5.3	11.4	10.7	40.2	61.9

WATERS OF THE U.S. (NON-WETLAND) DETERMINATION

~~The unnamed drainages within the Project site exhibited evidence of flow (i.e., sediment/silt deposition) sufficient to document the Ordinary High Water Mark (OHWM) (i.e., channel bed and bank lines), thus meeting the criteria for jurisdictional waters.~~ Evidence of an Ordinary High Water Mark (OHWM) was observed within the on-site ephemeral drainages, primarily indicated by sediment deposits. It should also be noted that Big Bear Lake adjoins the project site to the south. Based on discussions with the Big Bear Municipal Water District, the current water level of Big Bear Lake (as of June 28, 2004) is 6,727.8-feet above mean sea level (msl). The high water mark is reported to be 6,743.2 feet above msl. Refer to ~~Appendix 15.10, *Jurisdictional Delineation*, and~~ Exhibit 5.8-2, *Jurisdictional Map*, for an illustration of jurisdictional boundaries.

Based on the results of the field observations and data collection, RBF identified 0.15-acre of Corps jurisdictional "waters of the U.S." within the proposed project site. ~~The drainages are ephemeral.~~ In addition to on-site ephemeral drainages, the Corps considers Big Bear Lake jurisdictional. The Corps' jurisdictional limits are delineated at the high water line, which is reported to be at 6,743.20-foot elevation (and below).

CALIFORNIA DEPARTMENT OF FISH AND GAME (1602~~3~~) JURISDICTION

Based on the results of the field observations and data collection, RBF identified 0.15-acre of CDFG jurisdictional streambed~~waters~~ located within the boundaries of the Project site (refer to Exhibit 5.8-2, *Jurisdictional Map)*. As with the Corps, Big Bear Lake would be considered jurisdictional by the CDFG, including the approximate 4.14-acre lake shoreline. Utilizing the most current development plans, it was determined that the proposed improvements would impact 4.38-acres of CDFG jurisdiction (includes streambed, shoreline, and lake impacts). Refer to Section 5.8, *Biological Resources*, for further discussion regarding jurisdictional waters.

GROUNDWATER

The Big Bear Lake Watershed has been divided into seven hydrologic subunits based on surface water drainage divides. Two of the hydrologic subunits, the North Shore and Grout Creek Subunits, extend across most of the northern portion of Big Bear Lake. Although the subunits can be categorized as independent surface drainage catchments, their large size and/or elongated east-west extent warrant further subdivision to distinguish available groundwater resources in the eastern portion from available groundwater resources in the western portion.

As stated above, ~~T~~the groundwater conditions cited in this EIR are based on two separate reports prepared by Geoscience Support Services, Inc. (GSS). The GSS 2000 report includes data on the groundwater quality, on-site well operations (Wells-FP-2 and FP-3) and groundwater supply potential. ~~in 2000 and a~~ The GSS 2003 report ~~Focused Geohydrologic Evaluation of the Maximum Perennial Yield for the North Shore and Grout Creek Hydrologic Subareas, prepared in 2003~~ includes current data on groundwater supplies in the North Shore and Grout Creek Hydrologic Subunits. The findings in the GSS 2003 report regarding groundwater supplies are

assumed to supercede the 2000 findings. The GSS 2003 report presents a focused geohydrologic evaluation of the maximum perennial yield of the North Shore and Grout Creek Subunits that includes dividing each subunit into smaller tributary subareas. However, the data regarding groundwater quality and well operations in the GSS 2000 report are still applicable and cited in this section. It is also noted that the wells analyzed in the GSS 2000 report are not included in the GSS 2003 report, as they are non-operational. Well FP-2 is located on the Moon Camp project site.

Although the project area is located entirely within tributary subarea A of the North Shore Hydrologic Subunit, potential groundwater resources are analyzed for both the North Shore and the Grout Creek Hydrologic Subunits as they are both considered potential sources to supply water to the project.

~~According to the 2000 report, the entire project site is within subunit A of the North Shore subarea of Big Bear Lake. The western one-third lies within the Grout Creek subarea. The North Shore subarea is similar in several respects to the Grout Creek subarea. For example, a considerable amount of the water bearing (older alluvial) material present is above the known groundwater surface. Only a band of these materials adjacent to Big Bear Lake are continuously saturated.~~

~~According to a recent geohydrologic investigation of the Moon Camp Area by Geoscience Support Services (GSS, 2000), the older alluvial deposits represent the main water-bearing formation beneath the site. Groundwater-level data from two U.S. Forest Service wells located within the project area suggest that Big Bear Lake provides recharge to the aquifer beneath the project area. Additional groundwater recharge emanates from gravity drainage from the higher elevations north of the Moon Camp area.~~

~~Based on studies by GSS (2000), the main water-bearing zones within the older alluvial deposits consist of intermixed and interlayered sand and gravels. However, lithologic data from the two U.S. Forest Service wells indicate that these sand and gravel aquifers are not continuous over wide areas and tend to follow subsurface channels (GSS, 2000). In mid 2000, groundwater beneath the southern margin of the site was approximately 5 to 10 feet below the level in the lake. More recent groundwater level observations from the three exploratory borings drilled for the liquefaction analysis appears to be similar with respect to the level of the lake.~~

~~The results from GSS 2000 geohydrologic investigation indicate the recoverable amount of groundwater in the Moon Camp area is estimated at 230 acre-feet per year. Based on the nature of the aquifer materials, thickness of the aquifer and the discharge rate of existing wells in the Moon Camp area is estimated at 230 acre-feet per year. Based on the nature of the aquifer materials, thickness of the aquifer and the discharge rate of existing wells in the Moon Camp area, the potential to develop a 100 gallon per minute (gpm) water well supply is considered by GSS (2000) to be good. Chemical analyses of the groundwater from the two on-site water wells indicate that the groundwater is of superior quality. However, the iron concentration (0.69 mg/l) in one well exceeds the state maximum concentration limit for iron (0.3 mg/l) (GSS, 2000).~~

Maximum perennial yield was evaluated in the context of the total average annual ground water recharge within the North Shore and Grout Creek Subunits. Ground water recharge is the total amount of water that reaches the aquifer (i.e., ground water reservoir) through natural processes, such as deep percolation of precipitation falling on the land surface and infiltration beneath flowing stream channels. In the development of ground water resources for municipal supply, however, not all of the natural recharge that any given aquifer receives on an average annual basis can be developed.

Maximum perennial yield is distinguished from average annual ground water recharge through the following definition:

> *The maximum quantity of ground water perennially available if all possible methods and sources are developed for recharging the basin. The quantity depends on the amount of water economically, legally, and politically available to the organization or agency managing the basin (Todd, 1980).*

By definition, the maximum perennial yield is some portion (i.e. subset) of the total amount of ground water recharge that the aquifers receive from precipitation on an average annual basis. Not all of the water that reaches the aquifer can be developed for beneficial use because either it is not economically feasible, or there is no legal right to the water, or political constraints prevent or inhibit development.

Average annual ground water recharge estimates were assigned to smaller tributary subareas, which were determined from surface drainage divides within the larger hydrologic subunits. The North Shore Subunit was subdivided into six tributary subareas (A through F) and the Grout Creek Subunit was subdivided into four tributary subareas (A through D). The boundaries of the tributary subareas represent surface water drainage divides, which, for most of the tributary subareas also represent ground water flow divides. Exceptions include the margins of Big Bear Lake and in the southeast portion of the North Shore Subunit where the ground water within one subarea/subunit can be in hydraulic communication with adjacent subareas/subunits.

Average annual ground water recharge was estimated for each tributary subarea using a watershed hydrologic model and by estimating ground water underflow (conducted for the alluvial portion of the Grout Creek Subunit only). When possible, measured data was used as input for the analysis of ground water discharge. Measured data included:

- Long-term precipitation records from weather stations within the Big Bear Lake watershed,
- Evapotranspiration data from evaporation pans and weather stations within the watershed,
- Ground water levels, and
- Ground water production.

However, most of the input parameters that are required for a detailed evaluation of the average annual ground water recharge had to be estimated or assumed from data collected outside the Grout Creek and North Shore Subunits or outside the Big

Bear Lake Watershed due to lack of measured data in the area. Although the assumed values are published and are from reliable sources (i.e., the U.S. Environmental Protection Agency, United States Geological Survey, etc.), they are not specific to the area of interest. Numerous additional monitoring features can be developed to collect the data necessary to refine the ground water recharge estimates. However, priority should be given to the construction of monitoring wells and the development of a reliable ground water level baseline for the tributary subareas.

NORTH SHORE HYDROLOGIC SUBUNIT

Groundwater in the North Shore Hydrologic Subunit generally occurs in the unconsolidated alluvial deposits on the lower slopes of the surrounding mountains and in the fractures and weathered portions of the bedrock. Groundwater in the alluvium occurs at depths ranging from approximately 5 feet (ft) in the western portions of the Subunit and near the RV Park wells to approximately 50 ft near Division Well Nos. 6 and 7 (refer to Figure 2 in the GSS 2003 report for well location in the North Shore and Grout Creek Subunits).

Groundwater flows by gravity drainage from areas of high elevation (the mountain slopes) into areas of low elevation, ultimately collecting in the sediments beneath Big Bear Lake. Groundwater recharge likely occurs as deep percolation of runoff through the younger alluvium and fractures in the bedrock during periods of prolonged precipitation.

The primary sources of groundwater discharge from the North Shore Subunit are underflow and groundwater pumping from wells within the Subunit. The DWP currently operates four vertical production wells within the North Shore Subunit (RV Park Well Nos. 1 and 2 and Division Well Nos. 6 and 7). Combined average annual groundwater production from DWP wells between 1993 and 2002 is 282 acre-feet per year acre-ft/yr. Pumping data for the 20 private wells in the Subunit were not available. However, assuming that they are domestic sources and that an average single family home uses approximately 200 gallons per day per year (gpd/yr), it is estimated that production from these wells is approximately 4.5 acre-ft/yr.

Groundwater levels in the central portion of the North Shore Hydrologic Subunit, as measured in RV Park Well No. 1, have declined approximately 20 feet between 1996 and 2002. The groundwater level in this well is relatively stable, however, with most of the decline occurring after year 2000, a period of relatively dry climatic conditions. Groundwater levels in Division Well No. 6, located in the eastern portion of the Subunit, have declined approximately 80 ft between 1992 and 2003. Recent groundwater level declines in the eastern portion of the Subunit can also be correlated with dry climatic conditions, although the greater degree of decline is also a reflection of higher groundwater production in the area.

Estimates of Average Annual Groundwater Recharge (North Shore Subunit)

Estimates of average annual groundwater recharge were assigned to each tributary subarea using the watershed model. Required input parameters for the watershed model for which no measured data were available were obtained from the EPA

database of hydrologic parameters. Based on the watershed modeling results, the estimates of average annual groundwater recharge for the North Shore Hydrologic Subunit range from approximately 150 to 430 acre-ft/yr with a midpoint of approximately 290 acre-ft/yr. This range of recharge is approximately 2 to 7 percent of average annual precipitation for the Subunit, which is within the range of accepted recharge estimates for other groundwater basins in southern California (3 to 7 percent) determined by the Metropolitan Water District of Southern California (MWD). The midpoint of the range is approximately 4.5 percent of precipitation for the Subunit.

Estimates of average annual groundwater recharge for the six tributary subareas range from 27 acre-ft/yr (subarea E) to 73 acre-ft/yr (subarea B) (refer to Table 5.11-3, *Summary of Groundwater Recharge Results North Shore Tributary Subareas*). These groundwater recharge estimates represent the average of the watershed model output range, which is based on the average of typical and possible input values. The data suggests that the RV Park wells are producing groundwater at a rate (approximately 14 acre-ft/yr), which is well within their subarea's (subarea B) average annual groundwater recharge. Combined average annual groundwater production from Division Well Nos. 6 and 7 is exceeding that subarea's (subarea F) average annual groundwater recharge. However, it is important to note that these wells are in the alluvial portion of the subarea, which is in hydraulic continuity with the alluvial portions of the adjacent hydrologic subunit (i.e. the Division Subunit to the south). Accordingly, production from these wells should be evaluated in the context of the groundwater basin in this area and not the watershed tributary to the wells.

Maximum Perennial Yield (North Shore Subunit)

According to the GSS 2003 report, the midpoint of the estimated range of average annual groundwater recharge (approximately 290 acre-feet per year) is considered a good estimate of maximum perennial yield for the North Shore Hydrologic Subunit, given the available data.

The results of the ground water recharge analysis for the North Shore Subunit are as follows:

Table 5.11-3
Summary of Ground Water Recharge Results - North Shore Tributary Subareas

Tributary Subarea	Area (acres)	Annual Precipitation (inches)	Average Annual Ground Water Recharge – Low Estimate (acre-ft/yr)	Average Annual Ground Water Recharge – High Estimate (acre-ft/yr)	Average of Ground Water Recharge Estimate Range (acre-ft/yr)
A	247	27.87	14	44	29
B	720	25.45	36	110	73
C	828	23.01	37	107	72
D	558	21.45	22	63	43
E	392	20.01	15	39	27
F	814	18.27	23	66	44
TOTAL	3,559	136.06	147	429	288

GROUT CREEK HYDROLOGIC SUBUNIT

Groundwater within the Grout Creek Subunit occurs in both the bedrock and alluvium. The Cedar Dell slant wells (located in subarea C) are drilled into the Mesozoic granitic rock and typically produce approximately 20 gallons per minute, collectively. Groundwater in the alluvium occurs at depths ranging from approximately 20 to 90 ft and flows to the south toward Grout Bay (Big Bear Lake) at a gradient of 0.024 to 0.043 ft/ft. Pumping test and lithologic data from the Barbara Lee Lane Well and specific capacity data from Wells 12P01, 13C01, and Northshore Well Nos. 1, 2, and 3 were used to estimate aquifer transmissivity. Estimates range from 700 to 1,900 gpd/ft.

Groundwater recharge likely occurs within the Grout Creek streambed during periods of extended runoff, near the contact between the bedrock and alluvium and, to a lesser extent, as percolation of precipitation directly on the alluvium. Groundwater recharge also occurs through fractures in the bedrock formations.

The primary sources of groundwater discharge from the Grout Creek Subunit are underflow and groundwater pumping from wells within the Subunit. DWP currently operates two vertical production wells, two slant wells in bedrock, and one spring within the Grout Creek Subunit. Average annual groundwater production from DWP wells within the Subunit from 1989 to 2002 has been approximately 134 acre-ft/yr. With the exception of pumping from Barbara Lee Lane Well No. 1, all of the municipal groundwater production in the Grout Creek Hydrologic Subunit is from tributary subarea C. Pumping data for the 29 private wells in the Subunit were not available. However, assuming that they are domestic sources and that an average single family home uses about 200 gpd/yr, it is estimated that production from these wells is approximately 6.5 acre-ft/yr.

Estimates of Average Annual Groundwater Recharge (Grout Creek Subunit)

Groundwater level elevations in North Shore Well Nos. 1 and 3, both located at the discharge end of tributary subarea C, have been relatively stable between 1995 and 2003, with seasonal fluctuations and a minor decline during the relatively dry climatic cycle from 1999 to December 2003. The average annual groundwater recharge of the Grout Creek Subunit was estimated using the underflow method and the watershed model.

The underflow method indicated an average annual groundwater recharge estimate of approximately 200 acre-ft/yr. It should be noted, however, that the underflow calculation only accounts for outflow in the alluvial aquifer and does not account for outflow through the bedrock in the Subunit. It is assumed that some outflow occurs within the bedrock aquifer, which is one reason why the underflow estimate for the Grout Creek Subunit is lower than the perennial yield estimate from the watershed model (described below).

Based on the watershed modeling results, the average annual groundwater recharge for the Grout Creek Hydrologic Subunit (subareas A through D) is estimated to range from approximately 260 to 840 acre-ft/yr with a midpoint of approximately 550 acre-ft/yr (refer to Table 5.11-4, *Summary of Groundwater Recharge Results Grout Creek*

Tributary Subareas). This range of recharge is approximately 2 to 8 percent of average annual precipitation for the Subunit. The midpoint of the range is approximately 5 percent of precipitation for the Subunit. Assumed input parameters for the watershed model are based on the average of EPA' s suggested parameter ranges.

The relative disparity between the average annual recharge estimates obtained from the underflow analysis and watershed model is partly due to the estimated nature of the input parameters used in each analysis. In the case of the underflow analysis, the transmissivity parameter is estimated based on review of lithologic logs and pumping tests in wells within the Big Bear area that are perforated in similar aquifer materials. More representative values can be obtained via formal aquifer pumping tests using the wells in the Subunit. For the watershed model, 18 of the 20 required input parameters are estimated from the EPA' s database, which is not specific to the mountains of Southern California. Additionally, the underflow analysis does not account for all of the recharge within the bedrock. As data is collected in the future, the range of recharge will become less.

Estimates of average annual groundwater recharge for the four tributary subareas range from 66 acre-ft/yr (subarea D) to 217 acre-ft/yr (subarea C). These average annual recharge values represent the average of the watershed model output range, which is based on the average of typical and possible input values. These data suggest that average annual groundwater production from the Grout Creek Hydrologic Subunit (approximately 134 acre-ft/yr), which occurs almost entirely from tributary subarea C, is within the average annual recharge for both the tributary subarea and the hydrologic subunit.

Maximum Perennial Yield (Grout Creek Subunit)

The maximum perennial yield of the Grout Creek Hydrologic Subunit is within the range of average annual groundwater recharge specified by the watershed model, but is more likely to be in the lower end of the range than the upper end. As mentioned previously, by definition, maximum perennial yield is the amount of water that can be developed economically, legally and politically. In consideration of this, subareas A and B of the Grout Creek Subunit are remote and are located on land under the jurisdiction of the United States Forest Service (USFS). There is no established distribution system in subareas A and B of the Grout Creek Subunit. Furthermore, access to the area would likely require a lengthy negotiation process with the USFS. Given these factors, developing groundwater resources in these subareas is not currently practical.

At this time, it is recommended to use the sum of the midpoint recharge estimates for tributary subareas C and D (217 acre-ft plus 66 acre-ft; see Table 5.11-4) as the maximum perennial yield for the Grout Creek Subunit (total of 283 acre-ft/yr). It should be emphasized that as groundwater production is initiated in each subarea, it will be very important to monitor groundwater levels in dedicated non-pumping monitoring wells (i.e. " key wells") located in each tributary subarea from which groundwater is extracted. As was recommended for the North Shore Hydrologic Subunit, future management of the groundwater resources in each tributary subarea

should rely more on established groundwater level thresholds than the perennial yield estimates.

The results of the groundwater recharge analysis for the Grout Creek Subunit are as follows:

Table 5.11-4
Summary of Ground Water Recharge Results
Grout Creek Tributary Subareas

Tributary Subarea	Area (acres)	Annual Precipitation (inches)	Average Annual Ground Water Recharge – Low Estimate (acre-ft/yr)	Average Annual Ground Water Recharge – High Estimate (acre-ft/yr)	Average of Ground Water Recharge Estimate Range (acre-ft/yr)
A	1,074	33.44	74	249	161
B	850	29.01	50	160	105
C	1,668	29.93	104	331	217
D	592	26.74	32	99	66
Total (A to D)	4,184	119	260	839	549
Total (C and D only)	2,260	56.67	136	430	283

Tributary subareas A and B are excluded from the totals because they are not currently practicable to developed due to their remote locations and are located on land under the jurisdiction of the U.S. Forest Service.

GROUNDWATER QUALITY

According to the GSS 2000 Report, groundwater samples collected from Well FP-2 located on the southern portion of the Moon Camp site in 1987 was submitted for a full Title 22 analysis. The chemical analysis indicated that the groundwater quality in the Moon Camp area is calcium bicarbonate and is generally of superior water quality as all concentrations were below maximum contaminant levels (MCLs), with the exception of iron with a concentration of 0.69 mg/L. The MCL for iron is 0.3 mg/L. However, the iron concentration of Well-FP-3 (located approximately 800 feet to the northeast of Well FP-2) was only 0.06 mg/L, which suggest that iron concentrations are possibly lower elsewhere.

STORM WATER QUALITY

Storm water quality is a significant concern in Southern California. This section discusses typical pollutants found in storm water runoff and discusses what sort of contaminants may be found in existing storm water runoff. Based on the Clean Water Act, a 303 (d) list has been developed, which includes Big Bear Lake. The 303(d) Clean Water Act section contains a list of impaired surface water bodies which identifies primary pollutants, sources of pollutants and a priority schedule for developing Total Maximum Daily Loads (TNDL) to reduce the amount of pollutants in the water body. For a specific discussion concerning the status of the 303(d) listing for Big Bear Lake refer to the Existing Storm Water Quality discussion below.

NONPOINT SOURCE POLLUTANTS

A net effect of urbanization can be to increase pollutant export over naturally occurring conditions. The impact of the higher export can be on the adjacent streams and also on the downstream receiving waters. However, an important consideration in evaluating storm water quality from the project is to assess if it impairs the beneficial use to the receiving waters. Nonpoint source pollutants have been characterized by the following major categories in order to assist in determining the pertinent data and its use. Receiving waters can assimilate a limited quantity of various constituent elements, but there are thresholds beyond which the measured amount becomes a pollutant and results in an undesirable impact. Background of these standard water quality categories provides understanding of typical urbanization impacts.

Sediment. Sediment is made up of tiny soil particles that are washed or blown into surface waters. It is the major pollutant by volume in surface water. Suspended soil particles can cause the water to look cloudy or turbid. The fine sediment particles also act as a vehicle to transport other pollutants including nutrients, trace metals, and hydrocarbons. Construction-sites are the largest source of sediment for urban areas under development. Another major source of sediment is streambank erosion, which may be accelerated by increases in peak rates and volumes of runoff due to urbanization.

Nutrients. Nutrients are a major concern for surface water quality, especially phosphorous and nitrogen, which can cause algal blooms and excessive vegetative growth. Of the two, phosphorus is usually the limiting nutrient that controls the growth of algae in lakes. The orthophosphorous form of phosphorus is readily available for plant growth. The ammonium form of nitrogen can also have severe effects on surface water quality. The ammonium is converted to nitrate and nitrite forms of nitrogen in a process called nitrification. This process consumes large amounts of oxygen which can impair the dissolved oxygen levels in water. The nitrate form of nitrogen is very soluble and is found naturally at low levels in water. When nitrogen fertilizer is applied to lawns or other areas in excess of plant needs, nitrates can leach below the root zone, eventually reaching ground water. Orthophosphate from auto emissions also contributes phosphorus in areas with heavy automobile traffic. As a general rule of thumb, nutrient export is greatest from development sites with the most impervious areas. Other problems resulting from excess nutrients are 1) surface algal scums, 2) water discolorations, 3) odors, 4) toxic releases, and 5) overgrowth of plants. Common measures for nutrients are total nitrogen, organic nitrogen, total Kjeldahl nitrogen (TKN), nitrate, ammonia, total phosphate, and total organic carbon (TOC).

Trace Metals. Trace metals are primarily a concern because of their toxic effects on aquatic life, and their potential to contaminate drinking water supplies. The most common trace metals found in urban runoff are lead, zinc, and copper. Fallout from automobile emissions is also a major source of lead in urban areas. A large fraction of the trace metals in urban runoff are attached to sediment and this effectively reduces the level, which is immediately available for biological uptake and subsequent bioaccumulation. Metals associated with the sediment settle out rapidly and accumulate in the soils. Also, urban runoff events typically occur over a shorter

duration, which reduces the amount of exposure and could be toxic to the aquatic environment. The toxicity of trace metals in runoff varies with the hardness of the receiving water. As total hardness of the water increases, the threshold concentration levels for adverse effects increases.

Oxygen-Demanding Substances. Aquatic life is dependent on the dissolved oxygen in the water. When organic matter is consumed by microorganisms dissolved oxygen (DO) is consumed in the process. A rainfall event can deposit large quantities of oxygen demanding substance in lakes and streams. The biochemical oxygen demand of typical urban runoff is on the same order of magnitude as the effluent from an effective secondary wastewater treatment plant. A problem from low DO results when the rate of oxygen-demanding material exceeds the rate of replenishment. Oxygen demand is estimated by direct measure of DO and indirect measures such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), oils and greases, and total organic carbon (TOC).

Bacteria. Bacteria levels in undiluted urban runoff exceed public health standards for water contact recreation almost without exception. Studies have found that total coliform counts exceeded EPA water quality criteria at almost every site and almost every time it rained. The coliform bacteria that are detected may not be a health risk in themselves, but are often associated with human pathogens.

Oil and Grease. Oil and grease contain a wide variety of hydrocarbons some of which could be toxic to aquatic life in low concentrations. These materials initially float on water and create the familiar rainbow-colored film. Hydrocarbons have a strong affinity for sediment and quickly absorb within it. The major source of hydrocarbons in urban runoff is through leakage of crankcase oil and other lubricating agents from automobiles. Hydrocarbon levels are highest in the runoff from parking lots, roads, and service stations. Residential land uses generate less hydrocarbons export, although illegal disposal of waste oil into storm waters can be a local problem.

Other Toxic Chemicals. Priority pollutants are generally related to hazardous wastes or toxic chemicals and can be sometimes detected in storm water. Priority pollutant scans have been conducted in previous studies of urban runoff, which evaluated the presence of over 120 toxic chemicals and compounds. The scans rarely revealed toxins that exceeded the current safety criteria. The urban runoff scans were primarily conducted in suburban areas not expected to have many sources of toxic pollutants (with the possible exception of illegally disposed or applied household hazardous wastes). Measures of priority pollutants in storm water include - 1) phthalate (plasticizer compound), 2) phenols and creosols (wood preservatives), 3) pesticides and herbicides, 4) oils and greases, 5) metals.

PHYSICAL CHARACTERISTICS OF SURFACE WATER QUALITY

Standard parameters which can assess the quality of storm water provide a method of measuring impairment. A background of these typical characteristics assists in understanding water quality requirements. The quantity of a material in the environment and its characteristics determine the degree of availability as a pollutant in surface runoff. In an urban environment, the quantity of certain pollutants in the

environment is a function of the intensity of the land use. For instance, a high density of automobile traffic makes a number of potential pollutants (such as lead and hydrocarbons) more available. The availability of a material, such as a fertilizer, is a function of the quantity and the manner in which it is applied. Applying fertilizer in quantities that exceed plant needs leaves the excess nutrients available for loss to surface or ground water.

The physical properties and chemical constituents of water traditionally have served as the primary means for monitoring and evaluating water quality. Evaluating the condition of water through a water quality standard refers to its physical, chemical, or biological characteristics. Water quality parameters for storm water comprise a long list and are classified in many ways. In many cases, the concentration of an urban pollutant, rather that the annual load of that pollutant, is needed to assess a water quality problem. Some of the physical, chemical or biological characteristics that evaluate the quality of the surface runoff are:

Dissolved Oxygen. Dissolved oxygen in the water has a pronounced effect on the aquatic organisms and the chemical reactions that occur. It is one of the most important biological water quality characteristics in the aquatic environment. The dissolved oxygen concentration of a water body is determined by the solubility of oxygen, which is inversely related to water temperature, pressure, and biological activity. Dissolved oxygen is a transient property that can fluctuate rapidly in time and space. Dissolved oxygen represents the status of the water system at a particular point and time of sampling. The decomposition of organic debris in water is a slow process and the resulting changes in oxygen status respond slowly also. The oxygen demand is an indication of the pollutant load and includes measurements of biochemical oxygen demand or chemical oxygen demand.

Biochemical Oxygen Demand (BOD). The biochemical oxygen demand (BOD) is an index of the oxygen-demanding properties of the biodegradable material in the water. Samples are taken from the field and incubated in the laboratory after which the residual dissolved oxygen is measured. The BOD value commonly referenced is the standard 5-day values. These values are useful in assessing stream pollution loads and for comparison purposes.

Chemical Oxygen Demand. The chemical oxygen demand (COD) is a measure of the pollutant loading in terms of complete chemical oxidation using strong oxidizing agents. It can be determined quickly because it does not rely on bacteriological actions as with BOD. COD does not necessarily provide a good index of oxygen demanding properties in natural waters.

Total Dissolved Solids (TDS). TDS concentration is determined by evaporation of a filtered sample to obtain residue whose weight is divided by the sample volume. The TDS of natural waters varies widely. There are several reasons why TDS are an important indicator of water quality. Dissolved solids affect the ionic bonding strength related to other pollutants such as metals in the water. TDS are also a major determinant of aquatic habitat. TDS affect saturation concentration of dissolved oxygen and influence the ability of a water body to assimilate wastes. Eutrophication rates depend on total dissolved solids.

pH. The pH of water is the negative log, base 10, of the hydrogen ion (H^+) activity. A pH of 7 is neutral; a pH greater than 7 indicates alkaline water; a pH less than 7 represents acidic water. In natural water, carbon dioxide reactions are some of the most important in establishing pH. The pH at any one time is an indication of the balance of chemical equilibrium in water and affects the availability of certain chemicals or nutrients in water for uptake by plants. The pH of water directly affects fish and other aquatic life. Generally, toxic limits for pH values are less than 4.8 and greater than 9.2.

Alkalinity. Alkalinity is the opposite of acidity, representing the capacity of water to neutralize acid. Alkalinity is also linked to pH and is caused by the presence of carbonate, bicarbonate, and hydroxide, which are formed when carbon dioxide is dissolved. A high alkalinity is associated with a high pH and excessive solids. Most streams have alkalinities less than 200 mg/l. Typically, alkalinity of 100-200mg/l seem to support well-diversified aquatic life.

Specific Conductance. The specific conductivity of water, or its ability to conduct an electric current, is related to the total dissolved ionic solids. Long-term monitoring of a project's waters can develop a relationship between specific conductivity and TDS. Its measurement is quick and inexpensive and can be used to approximate TDS. Specific conductivities in excess of 2000 µohms/cm indicate a TDS level too high for most freshwater fish.

Turbidity. The clarity of water is an important indicator of water quality that relates to the ability of photosynthetic light to penetrate. Turbidity is an indicator of the property of water that causes light to become scattered or absorbed. Turbidity is caused by suspended clays and other organic particles. It can be used as an indicator of certain water quality constituents such as predicting the sediment concentrations.

Nitrogen (N). Sources of nitrogen in storm water are from the additions of organic matter or chemical additions to water bodies. Ammonia and nitrate are important nutrients for the growth of algae and other plants. Excessive nitrogen can lead to eutrophication since nitrification consumes dissolved oxygen in the water. Nitrogen occurs in many forms. Organic Nitrogen breaks down into ammonia, which eventually becomes oxidized to nitrate-nitrogen, a form available for plants. High concentrations of nitrate-nitrogen (N/N) in water can stimulate growth of algae and other aquatic plants, but if phosphorus (P) is present, only about 0.30 mg/l of nitrate-nitrogen is needed for algal blooms. Some fish life can be affected when nitrate-nitrogen exceeds 4.2 mg/l. There are a number of ways to measure the various forms of aquatic nitrogen. Typical measurements of nitrogen include Kjeldahl nitrogen (organic nitrogen plus ammonia); ammonia; nitrite plus nitrate; nitrite; and nitrogen in plants. The principal water quality criteria for nitrogen focus on nitrate and ammonia.

Phosphorus (P). Phosphorus is an important component of organic matter. In many water bodies, phosphorus is the limiting nutrient that prevents additional biological activity from occurring. The origin of this constituent in urban storm water discharge is generally from fertilizers and other industrial products. Orthophosphate is soluble and is considered to be the only biologically available form of phosphorus. Since phosphorus strongly associates with solid particles and is a significant part of organic

material, sediments influence concentration in water and are an important component of the phosphorus cycle in streams. Important methods of measurement include detecting orthophosphate and total phosphorus.

EXISTING STORM WATER QUALITY

Water quality monitoring has historically been conducted on Big Bear Lake. The monitoring has resulted in Big Bear Lake being listed on the Santa Ana Regional Water Quality Board Section 303(d) list for impaired water bodies. Table 5.11-5, *Big Bear Lake Pollutant List*, contains the 303(d) list of the pollutants found in Big Bear Lake and the source of the pollutant.

Table 5.11-5
Big Bear Lake Pollutant List

Pollutant Stressors	Source	Priority
Copper	Resource Extraction	High
Mercury	Resource Extraction	High
Metals	Resource Extraction	High
Noxious Aquatic Plants	Unknown Non-Point Source	High
Nutrients	Construction and Snow Skiing Activities	High
Sedimentation and Siltation	Construction, Snow Skiing Activities and Unknown Non-Point Source	High
Source: Draft 2002 Clean Water Act Section 303(D) List and TMDL Priority Schedule.		

The Project site lacks data on storm water runoff quality. In the absence of site-specific data, expected storm water quality can be qualitatively discussed by relating typical pollutants to specific land uses.

Currently, the site is vacant, consisting of primarily open space with trees and shrubs. The watershed is primarily open land with 83.7 percent of the watershed 100 percent pervious (natural area), 4.7 percent is 80 percent pervious (1 dwelling unit per acre), 9.2 percent is 70 percent pervious (2.5 dwelling units per acre) and 2.4 percent is 60 percent pervious (4 dwelling units per acre). The expected existing pollutants in the existing condition storm water runoff from the residential area are trash, nutrients, bacteria, oil and grease, and household hazardous wastes from the residential development. There is also oil and grease associated with automobile use on-site and on State Route 38. The natural areas that make up the majority of the site contribute suspended solids.

Currently, the site does not contain any structural Best Management Practices (BMP) which would potentially decrease the amount of pollutants in storm water runoff. It is likely that portions of potential pollutants are removed through the use of natural conveyance. Conveying flows overland through vegetation affords some infiltration and biofiltration of runoff and thus, potential pollutant removal. However, the residential areas are on the lakeshore end of the Project site, providing little natural

conveyance. A draw back to conveying flows overland is that it tends to create erosion problems and thus increase suspended solids in the runoff. Problems associated with suspended solids and erosion are evident on the Project Site as illustrated in Figure 5 of Appendix 15.9, *Hydrology Data*.

IMPACTS

SIGNIFICANCE CRITERIA

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains the Initial Study Environmental Checklist form used during preparation of the Project Initial Study, which is contained in Appendix 15.1, *Initial Study/Notice of Preparation*, of this EIR. The Initial Study includes questions relating to hydrology, drainage and water quality. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this Section. Accordingly, a project may create a significant environmental impact if it causes one or more of the following to occur:

- Violation of any water quality standards or waste discharge requirements (refer to Impact Statements 5.11-3 and 5.11-4);

- Substantial depletion of groundwater supplies or substantial interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted) (refer to Impact Statement, 5.11-2);

- Substantial alteration of the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site (refer to Impact Statement 5.11-1);

- Substantial alteration of the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site (refer to Impact Statement 5.11-1);

- Creation or contribution of runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provision of substantial additional sources of polluted runoff (refer to Impact Statement 5.11-1);

- Otherwise substantial degradation of water quality (refer to Impact Statements 5.11-3 and 5.11-4);

- Housing placement within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map (refer to Section 10.0, *Effects Found Not To Be Significant*);

- Placement within a 100-year flood hazard area structures which would impede or redirect flood flows (refer to Section 10.0, *Effects Found Not To Be Significant*); and/or

- Exposure of people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam (refer to Section 10.0, *Effects Found Not To Be Significant*).

Potential impacts associated with drainage and water quality are categorized below according to topic. Mitigation measures at the end of this Section directly correspond to the impact statements below.

The following discussion is an evaluation of the proposed Project which is then compared to the existing conditions analysis to determine impacts associated with development of the property. Proposed conditions investigated include: land use, proposed storm drain configuration, hydrology, floodplain mapping, groundwater and surface water quality.

Federal, State and local drainage laws and regulations govern the evaluation of impacts to surface water drainage. For this evaluation, impacts to surface water drainage would be considered significant if the Project alters the drainage patterns of the site, causing erosion, siltation, or increased runoff, thus, resulting in increased flooding. Increase in the amount of runoff could be considered significant if it impacts State Route 38 or downstream storm drain facilities.

The evaluation of impacts to storm water quality is of growing concern throughout Southern California. In response to the growing concerns and implementation of the Clean Water Act, the Santa Ana Regional Water Quality Control Board has a tentative draft of the Municipal National Pollution Discharge Elimination System (NPDES) Permit for San Bernardino County. The Order Number is R8-2002-0012. The current NPDES number for San Bernardino County is CAS618036.

Development Planning for Storm Water Management

The requirement to implement a program for development planning was based on Federal and State statutes including: Section 402 (p) of the Clean Water Act. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from the storm water conveyance system to the Maximum Extent Practicable.

For this evaluation, impacts to storm water quality would be considered significant if the project did not attempt to address storm water pollution to the maximum extent practicable. Currently, there are no definitive water quality standards that require storm water quality leaving a project site to meet standards for individual pollutants.

Therefore, impacts to storm water quality will be considered less than significant if they meet the requirements of the Water Quality Management Plan (WQMP). Starting January 2004 permittees (San Bernardino County) are required to review their existing BMPs for new developments and submit to Executive Officers for Review. Based on Order No. R8-200-0012 for San Bernardino County all new developments must follow the following guidelines:

> *A new development is defined as projects for which tentative tract or parcel map approval was not received by June 1, 2004. However, projects that have not commenced grading by the initial expiration date of the tentative tract or parcel map approval shall be deemed a new development project as defined in this section. New development does not include projects receiving map approval after June 1, 2004 that are proceeding under a common scheme of development that was the subject of a tentative tract or parcel map approval that occurred prior to June 1, 2004.*

The WQMP requirements for on-site and or watershed based BMPs include the following:

- The pollutants in post-development runoff shall be reduced using controls that utilize best available technology (BAT) and best conventional technology (BCT).
- The discharge of any listed pollutant to an impaired waterbody on the 303(d) list shall not cause or contribute to an exceedance of receiving water quality objective.

DRAINAGE AND RUNOFF

5.11-1 *The proposed Project could significantly alter drainage patterns which could result in increased erosion potential and runoff. Impacts are concluded as less than significant with implementation of the Project design features (i.e., the provision of adequate outlet structures, storm drains to contain flows and proper bluff drainage).*

HYDROLOGY

The hydrology calculations by Hicks & Hartwick were used to evaluate surface runoff associated with 10-year and 100-year hypothetical design storm frequencies from the tributary drainage areas. The watershed subarea boundaries were delineated according to physical constraints from the topography, existing drainage facilities and proposed developments. Exhibit 5.11-2, *Proposed Conditions Hydrology Map*, illustrates the hydrology for the proposed condition. Hydrologic parameters used in the analysis, such as rainfall and soil classification, are as presented in the *San Bernardino County Hydrology Manual*.

WATERSHED DESCRIPTION

The drainage patterns for the area follow the natural topography, north to south with the flow draining into Big Bear Lake. The proposed Project has some redirection of flow and the elimination of sheet flow across State Route 38. All cross-culverts would be designed to handle the 100-year storm event.

Due to on-site drainage patterns, the proposed Project site was divided into ten areas (A through J). Area "A" is on the eastern portion of the watershed and area "J" is on the western portion. In the proposed condition, the watershed delineation would slightly change from the existing condition due to grading and the proposed addition of impervious areas.

Table 5.11-6, *Proposed Condition Drainage Area Breakdown*, provides further detail on the ten drainage areas and subareas.

Table 5.11-6
Proposed Condition Drainage Area Breakdown

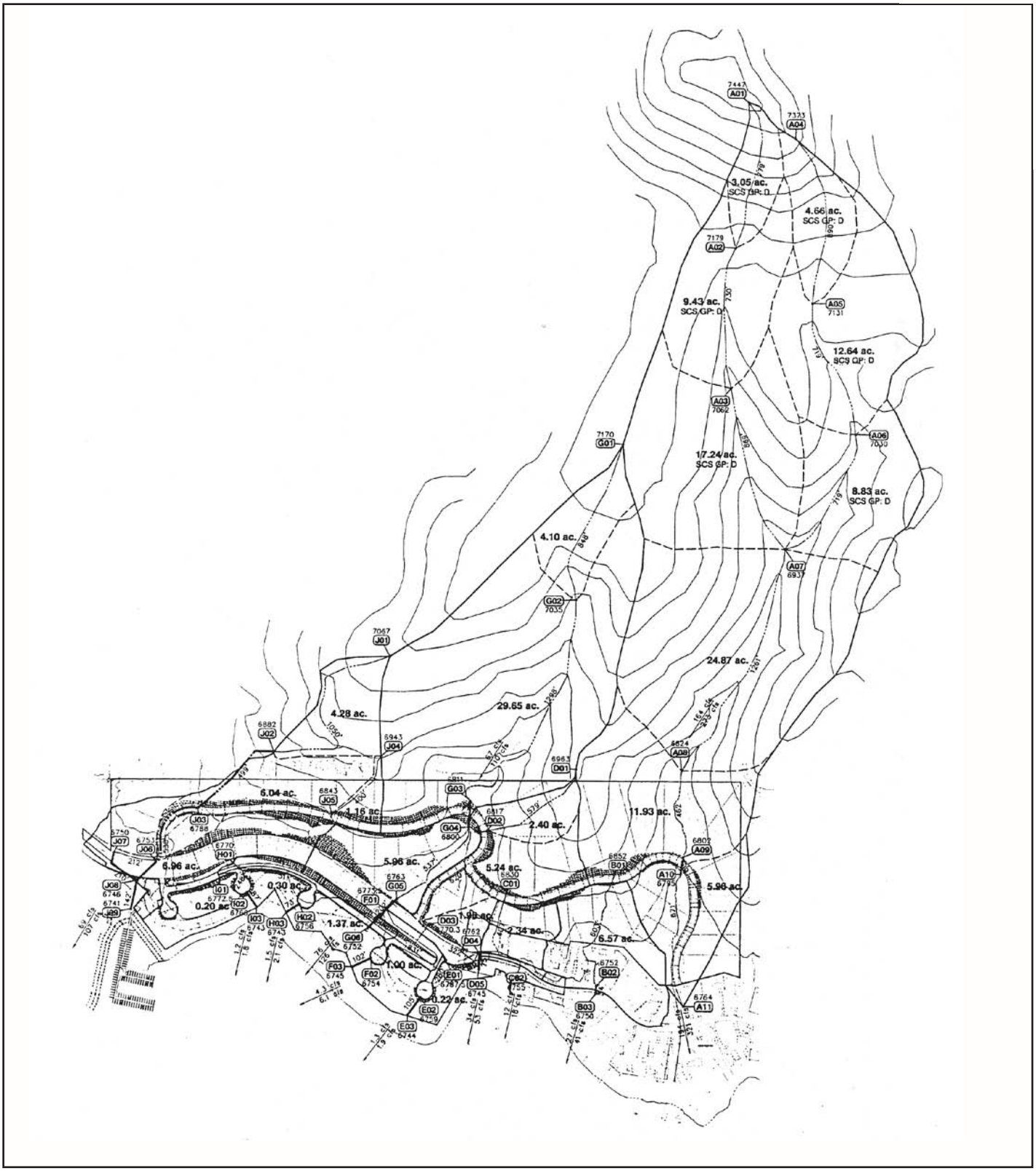
Drainage Area	Area (acres)	Number of Subareas
A	96.9	9
B	6.6	1
C	2.3	1
D	9.6	3
E	0.2	1
F	1.0	1
G	39.7	3
H	0.3	1
I	0.2	1
J	14.2	4

Approximately 35 percent of the overall watershed that contains the proposed Project would be developed. The 92 residential lots would contain custom homes along the north shore of Big Bear Lake. Table 5.11-7, *Percent Impervious Based on Land Use*, shows the percent impervious values for the types of land uses proposed on the Project site. The values presented are from the *San Bernardino County Hydrology Manual*.

Table 5.11-7
Percent Impervious Based on Land Use

Land Use	Percent Pervious
1.0 Dwelling per Acre	80%
2.0 Dwellings per Acre	60%
4.0 Dwellings per Acre	50%
1.0 Dwelling per 2.5 Acre	90%
Commercial [1]	10%
Natural Area – Soil Type C	100%
Natural Area – Soil Type D	100%

[1] This land use value was used for the proposed roadways.



Source: Hicks & Hartwick, Inc., Preliminary Drainage Study.

Not to Scale

RBF CONSULTING

PLANNING ■ DESIGN ■ CONSTRUCTION

12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Proposed Conditions Hydrology Map

Exhibit 5.11-2

Surface Water Hydrology

Table 5.11-8, *Proposed Condition Peak Flow Rates*, summarizes the results of the proposed condition hydrologic analysis.

The proposed condition would have a greater amount of impervious area than the existing condition. The change in impervious area would have the potential to cause significant downstream impacts. Hicks & Hartwick have proposed to upsize the cross culverts to contain the 100-year storm water flow along State Route 38 and eliminate sheet flow across the highway. They have also proposed to add catch basins and cross culverts along the residential roads. All flow would be directed into the Big Bear Lake, similar to the current condition. From the existing condition of 412.2 cfs for the 10-year and 669.1 cfs for the 100-year storm event, the overall watershed flow rate in the proposed condition would contain an increase of 8.7 cfs in the 10-year storm event and an increase of 9.5 cfs in the 100-year storm event. This was determined by calculating the change in total runoff between the existing condition and the proposed condition.

Provided that the proposed cross culverts are sized for 100-year burn and bulking flow rates, the burn and bulking method would increase the runoff from the natural areas. San Bernardino County Hydrology Manual does not contain a burning and bulking method. Therefore, the method found in the Los Angeles County Hydrology Manual is recommended to determine required culvert sizes. In addition, the cross culverts should all be designed with headwalls to prevent CMP crushing, and maintained adequately. No additional hydrologic mitigation is required.

In summary, the proposed Project would alter drainage areas and percent pervious areas on the Moon Camp site, which could be considered potentially significant to siltation and erosion potential unless mitigated. However, all cross culverts and storm drain systems would be sized appropriately so all flows leaving the site were contained, therefore no flooding would occur on- or off-site. Thus, potential flooding and erosion impacts would be reduced to less than significant levels with implementation of the recommended mitigation measures. Additionally, by placing inline filtration devices and water quality basins, the suspended solids being deposited into Big Bear Lake would be reduced to a less than significant level.

GROUNDWATER

5.11-2 *The proposed project may result in groundwater overdraft conditions. Although mitigation measures requiring further testing are referenced, based upon the evidence presented to date, it is concluded that groundwater overdraft is a significant adverse impact and until additional technical review is conducted, the project would result in an unavoidable adverse impact.*

GROUNDWATER RESOURCES

Based on the analyses presented in the GSS December 2003 Report, the following have been concluded regarding the maximum perennial yield of the North Shore Hydrologic Subunit:

- The North Shore Hydrologic Subunit can be conveniently subdivided into six tributary subareas (A through F) based on surface water drainage divides.

- The range of average annual ground water recharge for the North Shore Hydrologic Subunit as a whole is approximately 150 to 430 acre-ft/yr with a midpoint of approximately 290 acre-ft/yr. The midpoint of the range is approximately 4.5 percent of precipitation for the Subunit, which is within the range of accepted recharge estimates for other ground water basins in southern California (3 to 7 percent).

- Based upon the watershed modeling results, the midpoint of the average annual ground water recharge estimate (290 acre-ft/yr) is considered a good estimate of maximum perennial yield for the North Shore Hydrologic Subunit, given the available data. However, additional ground water monitoring and geohydrologic data collection are required in each individual subarea to manage the ground water resources in the area as it is developed in the future.

- Combined average annual ground water production from Division Well Nos. 6 and 7 is exceeding that subarea's average annual ground water recharge. However, these wells are in the alluvial portion of the subarea, which is in hydraulic continuity with the alluvial portions of the adjacent hydrologic subunit (i.e., the Division subunit to the south). Accordingly, production from these wells should be evaluated in the context of the ground water basin in this area and not the watershed tributary to the wells.

For the Grout Creek Hydrologic Subunit, the following is concluded:

- The Grout Creek Hydrologic Subunit can be conveniently subdivided into four tributary subareas (A through D) based on surface water drainage divides.

- The range of average annual recharge for the Grout Creek Hydrologic Subunit as a whole is approximately 260 to 840 acre-ft/yr with the midpoint of approximately 550 acre-ft/yr (subareas A through D). The midpoint of the range is approximately 5 percent of precipitation for the Subunit, which is within the range of accepted recharge estimates for other ground water basins in southern California (3 to 7 percent).

- Ground water resources in subareas A and B of the Grout Creek Subunit would be difficult to develop because they are remote and are located on land under the jurisdiction of the USFS.

- Due to the cost and political limitations associated with ground water development in subareas A and B, it is currently recommended to use the sum of the midpoint recharge estimates for tributary Subareas C and D (283 acre-ft/yr) as the maximum perennial yield for the Grout Creek Subunit.

GSS's 2003 Report concludes that, given the possible range of recharge for the North Shore and Grout Creek Hydrologic Subunits, and correspondingly the range of recharge for the individual tributary subareas within each subunit, it is recommended

that development planning for tributary subareas be initially based on the maximum perennial yield estimates as described above. However, as ground water production is initiated in each tributary subarea, it will be very important to monitor ground water levels in dedicated non-pumping monitoring wells located in each tributary subarea from which ground water is extracted. The GSS estimate of maximum perennial yield is based on long-term precipitation records. However, short-term periods (5 to 10 years) of relatively low precipitation have been observed throughout the period of record. These short-term periods of low precipitation are anticipated to have a significant impact on the ground water levels in the North Shore and Grout Creek Hydrologic Subunits because the storage capacity of the ground water reservoir is relatively small (shallow alluvium underlain by granitic bedrock). For this reason, GSS concludes that future ground water production, and development in each tributary subunit should rely more on established ground water level thresholds than the perennial yield estimates.

Upon completion of the 2003 GSS Report, RBF Consulting was directed by the County of San Bernardino to conduct a peer review of the report for incorporation into the EIR. Engineering Geologist, D. Scott Magorien, reviewed the subject GSS Report from the standpoint of assessing available ground water resources within the vicinity of the Moon Camp Project area. The primary concern is that there is not enough detail provided to do the kind of detailed review that is believed warranted in order to thoroughly evaluate the nature of the ground water resources, nor the actual long-term impacts on this resource in the vicinity of the Moon Camp Project site. The following points have been identified:

- The perennial yield is based on a watershed model that is run with assumptions for most of the parameters and is primarily based on long-term precipitation records. These results have a fair amount of uncertainty in them (they mention that they used many parameters that were not specific to the area of interest).

- The input parameters in the watershed models are estimated from the EPA's database, which are not specific to the mountains of Southern California.

- It is not possible to verify the calculations of underflow as the parameters used in the calculation (like the Transmissivity or aquifer thickness) and sample calculations are not provided.

- There should be a difference in recharge if the area is alluvium or bedrock. Based on the report, it is difficult to determine if the distinction is made in the modeling when assigning values. The output from the watershed modeling doesn't indicate it is an important distinction. For example, North Shore tributary subareas B and C have about the same recharge and the areas are similar, but C appears to be underlain by substantially more alluvium than subarea B. It appears that the watershed parameters are applied uniformly across the watershed.

- It is stated that the reason for the recent groundwater level declines in the eastern portion of North Shore can be correlated with dry climatic conditions although the greater degree of decline is also a reflection of higher

groundwater production in the area. Based on Mr. Magorien's review of the data, the production rate from Division Well No. 6 (see report Table 4) is the much more correlatable with the drop in water levels. Based upon information/studies available as of the publication of the Draft EIR, there is the potential that~~It appears~~ the North Shore Subunit is in an overdraft situation given ~~their~~the analyzed pumping rates.

- On page 23 of the 2003 report, it is stated that the range in recharge calculated is within the range of accepted recharge estimates for other ground water basins in southern California (3% - 7%). This is used as a quasi-validation of results. The high altitude alpine basins with substantial bedrock exposures seem to be a bit more unique.

Based on the information presented in the 2003 GSS report, as well as the 2000 report, it is concluded by Mr. Magorien in the peer review that the groundwater basin associated with the North Shore Hydrologic Subunit in which the Moon Camp Project area is situated~~, is in~~ has the potential to be in a state of overdraft. Any additional groundwater withdrawals from this Subunit will only exacerbate this potential overdraft condition. Considerably more investigative studies involving exploratory drilling and aquifer testing to assess the actual nature of the groundwater regime in the vicinity of the Moon Camp Project are is warranted. Furthermore, although there appears to be groundwater resources available within the neighboring Grout Creek hydrologic unit, a more thorough hydrogeologic investigation is also warranted for this hydrologic unit before additional groundwater resources can be exploited for a project the size of Moon Camp.

As stated in Section 5.3, *Public Services and Utilities*, the project would require approximately 46 acre-feet per year of water to meet the average daily water demand for the proposed residential uses. If water was obtained from existing well(s) (FP-2 and/or FP-3), which are located in subarea A of the North Creek Hydrologic Subunit, subarea A alone would not have the requisite water resources to meet the ADD over the course of a one-year period, as it only averages approximately 29 ac-ft/yr of groundwater recharge. Thus, it can be concluded that additional water resources beyond what is available from on-site wells or wells located within subarea A of the North Shore Hydrologic Subunit would need to be obtained to meet the water demands of the project.

~~Regarding the two existing wells located within the Moon Camp Project site, no mention was given in the latest GSS report as to the potential hydrologic interconnection of the groundwater aquifer with Big Bear Lake. Given the proximity of these wells to the lake, it appears highly probably that the water extracted from one or both of these wells could include some component of lake water.~~

Based upon the conclusions rendered by GSS and subsequent peer review, additional review is necessary to conclude hydrologic subunit effects. Although mitigation measures requiring further testing are referenced, based upon the evidence presented to date, it is concluded that impacts to groundwater resources are~~overdraft is~~ a significant adverse effect and until additional technical review is conducted to verify conditions, the Project would result in an unavoidable impact.

Interference with Big Bear Lake Water Levels

Regarding the two existing wells located within the Moon Camp Project site, no mention was given in the latest 2003 GSS report as to the potential hydrologic interconnection of the groundwater aquifer with Big Bear Lake. The GGSS 2000 report states that the water level in the lake is approximately 5 to 10 feet higher than the water level elevation of Well FP-2, indicating that there is the potential for recharge from the lake. Thus, given the proximity of the existing on-site wells to the lake, it appears highly probable that the water extracted from one or both of these wells could include some component of lake water. It may be possible to mitigate this impact by relocating wells up slope and away from the lake. However, further study is necessary to determine the interconnection of lake water to the subareas of the North Shore and Grout Creek Subunits.

GROUNDWATER QUALITY

As stated in the Existing Conditions section above, groundwater samples collected from Well FP-2 located on the southern portion of the Moon Camp site in 1987 were submitted for a full Title 22 analysis. The chemical analysis indicated that the groundwater quality in the Moon Camp area is generally of superior water quality, with the exception of iron concentration. Thus, if existing on-site wells are utilized for obtaining water resources for the proposed project, mitigation measures have been recommended to ensure that the wells are in acceptable operating condition and that groundwater does not exceed the maximum contaminant level (MCL) for iron concentrations (refer to Mitigation Measures 5.3-6a and 5.3-6b). However, it also acknowledged that all potential water resources, including the above referenced wells, for the proposed project would be subject to all applicable local, State and/or Federal groundwater quality standards.

WATER QUALITY - CONSTRUCTION

5.11-3 *Grading, excavation and construction activities associated with the proposed Project could impact water quality due to sheet erosion of exposed soils and subsequent deposition of particles and pollutants in drainage areas. Impacts would be reduced to a less than significant level through regulatory compliance and with incorporation of the recommended mitigation.*

Construction controls are separated from the rest of the water quality management because the measures are temporary and specific to the type of construction. Construction of a project such as the Moon Camp Project would typically produce potential pollutants such as nutrients, heavy metals, pesticides and herbicides, toxic chemicals related to construction and cleaning, waste materials including wash water, paints, wood, paper, concrete, food containers, and sanitary wastes, fuel, and lubricants.

Table 5.11-8
Proposed Condition Peak Flow Rates

Subarea	Area (acres)	Total Area (acres)	Tc (min)	Total 10-Year Peak Q (cfs)	Total 100-Year Peak Q (cfs)
Watershed A					
A1 – A2	3.0	3	16.6	7.8	12.2
A2 – A3	9.4	12.5	17.8	30.3	48.4
A3 – A7	17.2	29.7	18.8	69.0	111.0
A4 – A5	4.7	4.7	18.4	11.0	17.4
A5 – A6	12.6	17.3	19.2	39.4	62.5
A6 – A7	8.8	26.1	20.1	57.4	91.6
A7 – A8	24.9	79.0	1.4	170.1	277.3
A8 – A9	11.9	91.0	0.7	189.9	311.6
A9 – A10	6.0	96.9	1.0	194.3	321.0
Watershed B					
B1 – B2	6.6	6.6	8.7	27.5	41.5
Watershed C					
C1 – C2	2.3	2.3	6.8	11.9	17.7
Watershed D					
D1 – D2	2.4	2.4	8.2	10.4	15.8
D2 – D3	5.2	7.6	9.8	29.1	45.1
D3 – D4	2.0	9.6	10.7	34.1	53.5
Watershed E					
E1 – E2	0.2	0.2	5.8	1.3	1.9
Watershed F					
F1 – F2	1.0	1.0	9.5	4.3	6.1
Watershed G					
G1 – G2	4.1	4.1	20.0	8.6	14.1
G2 – G3	29.6	33.8	21.4	66.7	110.2
G3 – G4	6.0	39.7	22.3	76.1	126.0
Watershed H					
H1 – H2	0.3	0.3	7.6	1.5	2.1
Watershed I					
I1 – I2	0.2	0.2	5.7	1.2	1.8
Watershed J					
J1 – J2	4.3	4.3	9.4	17.3	25.7
J2 – J3	1.2	1.2	6.8	5.9	8.7
J3 – J4	6.0	7.2	9.6	28.0	43.6
J4 – J5	7.0	14.2	10.3	51.9	81.3

As part of compliance with the NPDES requirements, a Notice of Intent (NOI) would need to be prepared and submitted to the Santa Ana Regional Water Quality Control Board providing notification and intent to comply with the State of California general permit. Prior to construction, a Storm Water Pollution Prevention Plan (SWPPP) is required for the construction activities on-site. The SWPPP outlines the source control and/or treatment control BMPs that would avoid or mitigate runoff pollutants at the construction site to the "maximum extent practicable." Compliance with the NPDES requirements would reduce construction-related impacts to water quality to a less than significant level.

WATER QUALITY – LONG-TERM

5.11-4 *Project development may result in long-term impacts to the quality of storm water and urban runoff, subsequently impacting water quality. Impacts would be reduced to less than significant levels with incorporation of the recommended mitigation measures along with State and County Development Code requirements.*

A Water Quality Management Plan is required for the proposed Project as stated in the guidelines in the *Draft Water Quality Management Plan (WQMP) For Urban Runoff* prepared by San Bernardino County. The WQMP conforms to the new National Pollutant Discharge Elimination System (NPDES) permit requirement for San Bernardino County (effective as of July 2004). At the time of RBF's analysis, a Water Quality Management Plan had not been available for the Project.

Project development would increase the impervious area impacting storm water quality. The Project would increase pollutant loading in Big Bear Lake located immediately off-site. The lake is presently impaired due to the following existing pollutants: copper, mercury, metals, noxious aquatic plants, nutrients, and sediment and siltation. The 303(d) list currently indicates that all of the listed pollutants are a "high" priority. A "high" priority indicates that the receiving water body would be subject to Total Maximum Daily Loads (TMDL) by the year 2005. Based on the current Draft 303(d) list, it appears that the Santa Ana Regional Water Quality Control Board is currently developing TMDLs for Big Bear Lake. Therefore, the recommended mitigation focuses on meeting potential TMDLs for Big Bear Lake.

Preparation of a Water Quality Management Plan (WQMP) containing both structural and non-structural Best Management Practices (BMPs) is required. The WQMP would be based on the San Bernardino County Draft WQMP Guidelines and NPDES permits that will be in effect as of January 2004. Compliance with the NPDES permit, WQMP standards and specified mitigation would reduce long-term water quality impacts to less than significant levels.

Overall, the Project has the potential to violate water quality standards due to an increase in the level of activity on the Project site. Without mitigation, the Project would be expected to increase pollutant loadings, including hydrocarbons, fertilizers, and pesticides. The recommended mitigation includes a comprehensive Water Quality Management Plan (WQMP) for Urban Runoff, including both Structural and Non-Structural BMPs, which would comply with the requirements made by the Santa

Ana Regional Water Quality Control Board. This mitigation would reduce potential impacts to a less than significant level.

JURISDICTIONAL WATER IMPACTS

Refer to Section 5.8, *Biological Resources*, for a discussion of potential impacts to jurisdictional waters.

CUMULATIVE

5.11-5 *The proposed Project along with other future development may result in increased hydrology and drainage impacts in the area. Due to inconclusive of potential overdraft conditions, cumulative groundwater impacts are concluded to be significant and unavoidable. Other hydrology and drainage impacts are evaluated on a project-by-project basis in order to mitigate to a less than significant level.*

Due to inconclusive project testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit, cumulative impacts to the Subunit are also concluded to be significant and unavoidable.

For purposes of the drainage and water quality analysis, cumulative impacts are considered for projects in the same watershed as the proposed Moon Camp Project. Per the projects identified in Section 4.0, *Basis for Cumulative Analysis*, Tract 12217 (Marina Point), Tract 15465 (Kelsch) and Relocation of the Moonridge Zoo adjacent to the Discovery Center are all in the same watershed or adjacent watersheds as Moon Camp. All three of these cumulative projects drain into Big Bear Lake and would have to comply with the same TMDL standards and the Water Quality Management Plan for Urban Runoff as outlined in the Santa Ana Region's NPDES Permit and Water Discharge Requirements. Therefore, the cumulative impacts and mitigation for the Projects would be limited to those associated with the Moon Camp Project.

MITIGATION MEASURES

This section directly corresponds to the identified Impact Statements in the impacts subsection.

DRAINAGE AND RUNOFF

5.11-1 The proposed cross culverts shall be sized for 100-year burn and bulking flow rates. The burn and bulking method would increase the runoff from the natural areas. The method provided in the Los Angeles County Hydrology Manual is recommended. In addition, the cross culverts shall all be designed with headwalls to prevent CMP crushing, and shall be maintained adequately.

GROUNDWATER

Refer to Mitigation Measures 5.3-6a and 5.3-6b for mitigation regarding operations and groundwater quality from existing on-site wells.

~~5.11-2 Based upon the technical analysis presented, a potential groundwater overdraft condition would occur and no additional mitigation measures have been identified.~~

5.11-2a Within three months of project approval, the Project Applicant shall submit a plan for a detailed geohydrologic investigation. The plan must present the possible sources of groundwater selected for the project and the methodology proposed to investigate those sources. If the on-site wells are to be utilized to serve this project, it must be determined if either could draw water from Big Bear Lake. The plan must be prepared by a California Registered Geologist.

5.11-2b Within six months of plan approval, the Project Applicant shall submit the results of the geohydrologic investigation. The report must be prepared by a California Registered Geologist.

5.11-2c Concurrently or within three months of approval by the geohydrologic report, the Project Applicant shall submit a groundwater monitoring plan in accordance with San Bernardino County's "Guidelines for Preparation of a Groundwater Monitoring Plan." The plan must be prepared by a California Registered Geologist.

WATER QUALITY - CONSTRUCTION

5.11-3 Prior to Grading Permit issuance and as part of the Project's compliance with the NPDES requirements, a Notice of Intent (NOI) shall be prepared and submitted to the Santa Ana Regional Water Quality Control Board providing notification and intent to comply with the State of California general permit. Also, a Storm Water Pollution Prevention Plan (SWPPP) shall be completed for the construction activities on-site. A copy of the SWPPP shall be available and implemented at the construction-site at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction-site to the "maximum extent practicable." At a minimum, the following shall be implemented from the *California Storm Water Best Management Practice Handbook - Construction Activity:*

- *CA 1 Dewatering Operations* – This operation requires the use of sediment controls to prevent or reduce the discharge of pollutants to storm water from dewatering operations.

- *CA 2 Paving Operations* – Prevent or reduce the runoff of pollutants from paving operations by proper storage of materials, protecting storm drain facilities during construction, and training employees.

- *CA 3 Structural Construction and Painting* – Keep site and area clean and orderly, use erosion control, use proper storage facilities, use safe products and train employees to prevent and reduce pollutant discharge to storm water facilities from construction and painting.

- *CA 10 Material Delivery and Storage* – Minimize the storage of hazardous materials on-site. If stored on-site, keep in designated areas, install secondary containment, conduct regular inspections and train employees.

- *CA 11 Material Use* – Prevent and reduce the discharge of pesticides, herbicides, fertilizers, detergents, plaster, petroleum products and other hazardous materials from entering the storm water.

- *CA 20 Solid Waste Management* - This BMP describes the requirements to properly design and maintain trash storage areas. The primary design feature requires the storage of trash in covered areas.

- *CA 21 Hazardous Waste Management* - This BMP describes the requirements to properly design and maintain waste areas.

- *CA 23 Concrete Waste Management* – Prevent and reduce pollutant discharge to storm water from concrete waste by performing on and off-site washouts in designated areas and training employees and consultants.

- *CA 24 Sanitary Septic Water Management* – Provide convenient, well-maintained facilities, and arrange regular service and disposal of sanitary waste.

- *CA 30 Vehicle and Equipment Cleaning* – Use off-site facilities or wash in designated areas to reduce pollutant discharge into the storm drain facilities.

- *CA 31 Vehicle and Equipment Fueling* – Use off-site facilities or designated areas with enclosures or coverings to reduce pollutant discharge into the storm drain facilities.

- *CA 32 Vehicle and Equipment Maintenance* – Use off-site facilities or designated areas with enclosing or coverings to reduce pollutant discharge into the storm drain facilities. In addition, run a “dry site” to prevent pollution discharge into storm drains.

- *CA 40 Employee and Subcontractor Training* – Have a training session for employees and subcontractors to understand the need for implementation and usage of BMPs.

- *ESC 2 Preservation of Existing Vegetation* – Minimize the removal of existing trees and shrubs since they serve as erosion control.

- *ESC 10 Seeding and Planting* – Provide soil stability by planting and seeding grasses, trees, shrubs, vines, and ground cover.

- *ESC 11 Mulching* – Stabilize cleared or freshly seeded areas with mulch.

- *ESC 20 Geotextiles and Mats* – Natural or synthetics material can be used for soil stability.

- *ESC Dust Control* – Reduce wind erosion and dust generated by construction activities by using dust control measures.

- *ESC 23 Construction Road Stabilization* – All on-site vehicle transport routes shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust.

- *ESC 24* – Stabilized Construction Entrance – Stabilize the entrance pad to the construction area to reduce amount of sediment tracked off-site.

- *ESC 30 Earth Dikes* – Construct earth dikes of compacted soil to divert runoff or channel water to a desired location.

- *ESC 31 Temporary Drains and Swales* – Use temporary drains and swales to divert off-site runoff around the construction-site and stabilized areas and to direct it into sediment basins or traps.

- *ESC 40 Outlet Protection* – Use rock or grouted rock at outlet pipes to prevent scouring of soil caused by high velocities.

- *ESC 41 Check Dams* – Use check dams to reduce velocities of concentrated flows, thereby reducing erosion and promoting sedimentation behind the dams. Check dams are small and placed across swales and drainage ditches.

- *ESC 50 Silt Fence* – Composed of filter fabric, these are entrenched, attached to support poles, and sometimes backed by wire fence support. Silt fences promote sedimentation behind the fence of sediment-laden water.

- *ESC 51 Straw Bale Barrier* – Place straw bales end to end in a level contour in a shallow trench and stake them in place. The bales detain runoff and promote sedimentation.

- *ESC 52 Sand Bag Barriers* – By stacking sand bags on a level contour, a barrier is created to detain sediment-laden water. The barrier promotes sedimentation.

- *ESC 53 Brush or Rock Filter* – Made of 0.75 to 3-inch diameter rocks placed on a level contour or composed of brush wrapped in filter cloth and staked to the toe of the slope provides a sediment trap.

- *ESC 54 Storm Drain Inlet Protection* – Devices that remove sediment from sediment laden storm water before entering the storm drain inlet or catch basin.

- *ESC 55 Sediment Trap* – A sediment trap is a small, excavated, or bermed area where runoff for small drainage areas can pass through allowing sediment to settle out.

WATER QUALITY – LONG-TERM

5.11-4a Prior to Grading Permit issuance, a Water Quality Management Plan shall be developed and shall include both Non-Structural and Source Control BMPs. The WQMP shall conform to the San Bernardino County Draft NPDES permit and WQMP standards. The following are the minimum required controls to be implemented as a part of the *Water Quality Management Plan (WQMP) for Urban Runoff.*

- *Education for Property Owners, Tenants and Occupations* – The Property Owners Association is required to provide awareness educational material, including information provided by San Bernardino County. The materials shall include a description of chemicals that should be limited to the property and proper disposal, including prohibition of hosing waste directly to gutters, catch basins, storm drains or the lake.

- *Activity Restrictions* – The developer shall prepare conditions, covenants and restriction of the protection of surface water quality.

- *Common Area Landscape Management* – For the common landscape areas on-going maintenance shall occur consistent with County Administrative Design Guidelines or city equivalent, plus fertilizer and pesticide usage consistent with the instructions contained on product labels and with regulation administered by the State Department of Pesticide Regulation or county equivalent.

- *Common Area Catch Basin Inspection* – Property Owners Associations shall have privately owned catch basins cleaned and maintained, as needed. These are intended to prevent sediment, garden waste, trash and other pollutants from entering the public streets and storm drain systems.

- *Common Area Litter Control* – POAs shall be required to implement trash management and litter control procedures to minimize pollution to drainage waters.

- *Street Sweeping Private Streets and Parking Lots* – Streets and Parking lots shall be swept as needed, to prevent sediment, garden waste, trash and other pollutants from entering public streets and storm drain systems.

The following controls from the *California Storm Water Best Management Practice Handbook - Municipal* shall be employed:

- *SC10 Housekeeping Practices* - This entails practices such as cleaning up spills, proper disposal of certain substances and wise application of chemicals.

- *SC32 Used Oil Recycling* - May apply to maintenance and security vehicles.

- *SC72 Vegetation Controls* – Vegetation control typically includes chemical (herbicide) application and mechanical methods. Chemical methods are discussed in SC10. Mechanical methods include leaving existing vegetation, cutting less frequently, hand cutting, planting low maintenance vegetation, collecting and properly disposing of clippings and cuttings, and educating employees and the public.

- *SC73 Storm Drain Flushing* - Although general storm drain gradients are sufficiently steep for self-cleansing, visual inspection may reveal a buildup of sediment and other pollutants at the inlets or outlets, in which case flushing may be advisable.

5.11-4b The Water Quality Management Plan (WQMP) shall include Structural or Treatment BMPs. The structural BMPs utilized shall focus on meeting potential TMDL requirements for noxious aquatic plants, nutrients, sedimentation and siltation. The structural BMPs shall conform to the San Bernardino County NPDES permit and the San Bernardino WQMP standards.

Consistent with the WQMP guidelines contained in the *Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements* for San Bernardino County, Structural BMPs shall be required for the proposed Project. They shall be sized to comply with one of the following numeric sizing criteria or be considered by the permittees to provide equivalent or better treatment.

Volume Based BMPs shall be designed to infiltrate or treat either:

- The volume of runoff produced from the 85th percentile 24-hour storm event, as determined from the local historical rainfall record; or

- The volume of the annual runoff produced by the 85th percentile 24-hours rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban

Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or

- The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practice Handbook – Industrial/Commercial (1993); or

- The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event.

OR

Flow – based BMPs shall be designed to infiltrate or treat either:

- The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or

- The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or

- The maximum flow rate of runoff, as determined from the local historical rainfall record that achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

The following are the minimum required controls to be implemented as a part of the *Water Quality Management Plan (WQMP) for Urban Runoff.*

- *Control of Impervious Runoff* – Surface runoff shall be directed to landscaped areas or pervious areas.

- *Common Area Efficient Irrigation* – Physical implementation of the landscape plan consistent with County Administrative Design Guidelines or city equivalent, which may include provision of water sensors, programmable irrigation timers, etc.

- *Common Area Runoff-Minimizing Landscape Design* – Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration.

- *Catch Basin Stenciling* – "No Dumping – Flows to Lake" or equivalent effective phrase shall be stenciled on catch basins to alert the public as to the destination of pollutant discharging into storm drain.

- *Debris Posts* – These shall be installed to prevent large floatable debris from entering the storm drains. They shall be placed upstream of the cross culverts.

- *Inlet Trash Racks* – These shall be installed where appropriate to reduce intake and transport through the storm drain system of large floatable debris. Trash racks shall be provided where drainage from open areas enters storm drain or cross culverts.

5.11-4c Storm water treatment under the NPDES Permit and the future TMDL requirements shall include the construction of treatment BMPs. Treatment BMPs appropriate for on-site use shall include infiltration trenches and basins, swales, inlet filtration, and/or water quality basins. All storm water runoff shall be treated before leaving the site to reduce pollutants in Big Bear Lake.

Infiltration Trenches and Basins

Infiltration Trenches and/or Basins shall be used on site to meet potential future TMDLs for noxious aquatic plants and nutrients. Infiltration trenches and basins treat storm water runoff through filtration. A typical infiltration trench is essentially an excavated trench, that is lined with filter fabric and backfilled with stones. Depth of the infiltration trench shall range from three to eight feet and shall be located in areas with permeable soils, and water table and bedrock depth situated well below the bottom of the trench. Trenches shall not be used to trap coarse sediments since large sediment would likely clog the trench. Grass buffers may be installed to capture sediment before it enters the trench to minimize clogging. Infiltration basins shall be used for drainage areas between five and 50 acres. Infiltration basins shall be either in-line or off-line, and may treat different volumes such as the water quality volume or the 2-year or 10-year storm.

Swales

The project shall implement either vegetative swales, enhanced vegetated swales utilizing check dams and wide depressions, a series of small detention facilities designed similarly to a dry detention basin, or a combination of these treatment methods into a treatment train (series of Structural BMPs). The Water Quality Management Plan shall address treatment for the Project to assure that runoff from the site is treated to the “maximum extent practicable”.

The swales shall be treated as water quality features and shall be maintained differently than grass areas. Specifically, pesticides, herbicide, and fertilizers, which may be used on the grass areas, shall not be used in the vegetation swales.

Filtration

Filtration shall be implemented as a treatment method and shall use drop-in infiltration devices or inline devices.

Drop-infiltration devices at all curb inlets within the internal parking lots shall be implemented to provide potential pollutant removal. Existing examples of these filtration devices include the Drain Pac Storm Drain Inserts and Fossil Filters. These types of devices are efficient at removing oil and grease, debris, and suspended solids from treated waters. Some of these devices have also exhibited high efficiencies at removing heavy metals and other pollutants.

Inline devices suggested for use onsite include the Continuous Deflection Separator (CDS® unit). Once the runoff has entered the storm drain, an in-line diversion would direct the treatment flow to a CDS® unit. The CDS® unit is a non-blocking, non-mechanical screening system, which would provide a second line of defense for solids removal. Adsorption materials can be added within the CDS® unit to aid in the removal of oil and grease. The treated flow will exit the CDS® unit and continue downstream.

To assure the efficiency of these filtration devices, monitoring shall be conducted. The use of street sweeps on the parking lots and streets shall aid in reducing the amounts of sediment and debris that flow through the devices. This will extend the effectiveness of the devices during a storm and will lower the frequency of required maintenance. The devices shall be checked and cleaned, if necessary, once a month during the rainy season, following any precipitation and at the end of the dry season prior to the first precipitation event of the rainy season.

Consideration shall be given to using these filtration units in other areas besides the parking lot inlets. Another potential location is at the downstream end of the tributary pipes that feed the discharge point. Siting these units at a downstream point would allow for the treatment of a greater amount of runoff.

CUMULATIVE

5.11-5 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Due to inconclusive testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit, project and cumulative impacts are concluded to be significant and unavoidable.

If the County of San Bernardino approves the project, the County shall be required to adopt findings in accordance with Section 15091 of the CEQA Guidelines and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the CEQA Guidelines.

No additional significant impacts related to hydrology and water quality have been identified following implementation of the recommended mitigation measures and/or through regulatory compliance.

6.0 Long-Term Implications of the Proposed Project

6.0 LONG-TERM IMPLICATIONS OF THE PROPOSED PROJECT

6.1 THE RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

If the proposed Project is approved and constructed, a variety of short-term and long-term impacts would occur on a local level. During Project grading and construction, portions of surrounding uses may be temporarily impacted by dust and noise. Short-term erosion may occur during grading. There may also be a minor increase in dust and vehicle emissions caused by grading and construction activities. However, these disruptions would be temporary, and may be mitigated to a large degree through mitigation cited in this report and the standards for construction as cited in the County of San Bernardino Development Code (refer to Section 5.0, *Description of Environmental Setting, Impacts and Mitigation Measures*).

Ultimate development of the Project site would create long-term environmental consequences that are associated with a transition in land use. The long-term effects of the proposed Project and subsequent development may impact the physical, aesthetic, and human environments. Long-term physical consequences of development include: increased traffic volumes, additional noise created by traffic generated from the Project, incremental increased demands for public utilities, and increased energy and natural resource consumption. Long-term biological resource consequences associated with grading, construction and landscaping would also include the replacement of on-site vegetation with other plant varieties. Long-term visual/aesthetic impacts include alterations in views across the site. Incremental degradation of local and regional air quality would also be a long-term impact.

6.2 IRREVERSIBLE ENVIRONMENTAL CHANGES THAT WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

Approval of the proposed Project would cause irreversible environmental changes. Implementation of the proposed Project would result in the following changes:

- Commitment of land, which would be physically altered.
- Vegetation removal for grading and construction activities.
- Alteration of the human environment as a consequence of the development process. The project represents an enhanced commitment to residential and recreational uses which intensifies land uses on the project site.

- Utilization of various new raw materials, such as lumber, sand and gravel for construction. Some of these resources are already being depleted worldwide. The energy consumed in development and maintaining the site may be considered a permanent investment.

- Incremental increases in vehicular activity in the surrounding circulation system, resulting in associated increases in air emissions and noise levels.

6.3 GROWTH-INDUCING IMPACTS

Pursuant to the California Environmental Quality Act (CEQA) Guidelines, Section 15126(g), the following discussion identifies ways in which the proposed Moon Camp Project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. According to CEQA, growth-inducing impacts should be assessed in terms of whether a proposed project influences the rate, location, and the amount of growth. Projects that remove obstacles to population growth, or allow or encourage growth that would not otherwise have occurred if the project were not built, would be growth inducing. Potential growth-inducing impacts are also assessed based on a project's consistency with adopted plans that have addressed growth management from a local and regional standpoint.

Potential growth-inducing impacts from the proposed Moon Camp Project are analyzed below as they relate to population, housing and employment factors. Also refer to Section 5.1, *Land Use and Relevant Planning*, for additional analyses.

REGIONAL AND LOCAL SETTING

San Bernardino County encompasses approximately 20,160 square miles. Approximately ninety percent of the County is desert and the remainder consists of the San Bernardino Valley and San Bernardino Mountains. The City of Big Bear Lake is situated along the south shore of Big Bear Lake. Data available for the City of Big Bear Lake is utilized as background information for this Section. The Community of Fawnskin, located along the north shore of Big Bear Lake, differs from the City of Big Bear Lake and south shore area in that Fawnskin does not encounter the vast numbers of tourists and visitors during holiday weekends and/or peak winter or summer travel times.

Population and housing data from the 2000 Census were obtained for the County of San Bernardino and the City of Big Bear Lake. The 2000 Census does not recognize Fawnskin in the category of "Place," thus, data for Fawnskin is based upon the Census database for the 92333 Zip Code. The 92333 Zip Code database generally encompasses the area between Holcomb Valley Rd. on the east, Polique Canyon Rd. on the north, North Shore Drive on the South and Rim of the World Drive on the west. Thus, it is assumed that the 92333 Zip Code database represents the Community of Fawnskin. Since the 1990 Census also does not recognize Fawnskin in the category of "Place," and does not have a database for the 92333 Zip Code, information is based on 2000 Census data only.

POPULATION

San Bernardino County. San Bernardino County is one of the fastest growing counties in California. According to the U.S. Census, the County's 2000 Census population was 1,709,434 persons, representing an approximately 17 percent population increase over the County's 1990 Census population of 1,418,380 persons. San Bernardino County's 2002 population was an estimated 1,783,656 persons.[1]

City of Big Bear Lake. The City of Big Bear Lake's 1990 population was 5,351 persons. Between 1990 and 2000 the City grew by less than one percent with a 2000 population of 5,438 persons. The City's 2002 population was an estimated 5,696 persons.[2]

Community of Fawnskin. According to the U.S. Census, the Community of Fawnskin's permanent population in 2000 was 409 persons. In addition to the permanent population, the community experiences seasonal fluctuations in its population. The seasonal population is comprised of both winter and non-winter visitation and activities, although these temporary changes in population peak during winter. Thus, due to the resort nature of the Community, many of the residences listed as "vacant" in the 2000 Census are occupied during seasonal periods, weekends, and/or Holidays. Assuming that all of the 664 existing housing units are occupied simultaneously, it can be concluded that as many as 1428 persons (664 housing units x 2.15 persons per household) could potentially populate the Fawnskin Community during peak weekend/holiday periods.

HOUSING

San Bernardino County. According to the 2000 Census, San Bernardino County's housing stock was an estimated 601,369 units. The County's housing stock increased by approximately 10 percent between 1990 (542,332 units) and 2000. In 2000, approximately 12 percent (72,775 units) of the housing units were vacant. The average household size (persons per household) in 2000 was 3.15 persons. In 2002, the County's total housing stock was an estimated 612,890 units and vacancy rate was approximately 12 percent.[3]

City of Big Bear Lake. The City of Big Bear Lake's housing stock as of 2000 was an estimated 8,705 housing units, representing an increase of approximately two percent over the City's 1990 housing stock of 8,564 housing units. In 2000, approximately 73 percent (6,362 units) of the housing units were vacant. The average household size in 2000 was 2.31 persons. In 2002, the City's total housing stock was an estimated 8,941 units and vacancy rate was approximately 73

[1] State of California, Department of Finance, *City/County Population and Housing Estimates, 2002, Revised 2001, with 2000 Census Counts*. Sacramento, California, May 2002.

[2] Ibid.

[3] Ibid.

percent.[4] This vacancy rate is attributed to the fact that many of the homes are not the permanent/primary residence for the property owners.

Community of Fawnskin. In 2000, Fawnskin's total housing stock was an estimated 664 housing units. Approximately 71 percent (474 units) of the housing units were vacant. As with the City of Big Bear Lake, the Community's high vacancy rate is attributed to the fact that the majority of the homes are not the permanent/primary residence for the property owners. The average household size in 2000 was 2.15 persons.

EMPLOYMENT

The County's civilian labor force in 2001 was an estimated 814,600 persons, while the unemployment rate was approximately 4.8 percent. The total number of jobs existing in the County in 2001 for all industries was 560,400. The vast majority of these jobs were in the service-producing sector (approximately 80 percent) including approximately 25 percent in the services sector and approximately 25 percent in the trade sector.

Employment data is not available for the City of Big Bear Lake or the Community of Fawnskin.

PROJECT IMPACTS

Implementation of the proposed Project would result in the development of as many as 92 housing units. Based on the City of Big Bear Lake average household size multiplier of 2.31 persons per household, the proposed Project has the potential to increase Fawnskin's population by approximately 212 persons at buildout. The Project's potential population growth would represent an approximately 52 percent increase over the Community's permanent population estimate of 409 persons (2000) and an approximately 15 percent increase over the Community's peak weekend/holiday period population of 1,428 persons. Project implementation would be considered growth inducing inasmuch as the proposed development would result in the construction of additional housing, consequentially fostering population growth.

Potential growth-inducing impacts are also assessed based on a project's consistency with adopted plans that have addressed growth management from a local and regional standpoint. The following discussion addresses the Project's consistency with the General Plan.

As noted in Section 5.1, *Land Use and Relevant Planning*, the Project site is currently designated Rural Living (RL)-40. Based on the 40-acre minimum lot size for the RL District, the dwelling unit potential of the Project site is approximately two dwelling units (62.43/40=1.56). Based upon the City of Big Bear Lake's estimate of 2.31 persons per household and a dwelling unit potential of two units, Fawnskin's population could increase by approximately three persons under the existing RL-40 District. Thus, the proposed Project would result in a greater population increase (212 additional persons) than what would be anticipated under the existing RL-40

[4] Ibid.

District. Project implementation would be considered growth inducing inasmuch as the proposed development would result in a greater population increase than what was anticipated with the existing RL-40 District.

As discussed in Section 5.3, *Public Utilities*, Project implementation would require the expansion of existing water and wastewater facilities to meet increased demands associated with Project-related population growth. This extension is not considered growth inducing inasmuch as the extension was anticipated in the General Plan. As discussed in Section 5.1, *Land Use and Relevant Planning*, the Project site is designated Improvement Level 1 (IL-1). IL-1 is applied to those areas planned for the densest and highest intensity level of development. The Project would be required to provide each of the improvements specified in Figure II-15 of the San Bernardino County General Plan, *Improvement Standards – Mountain*. The Project would be subject to implementation of the IL-1 standards according to more detailed County guidelines. With implementation of the required improvements, the Project would provide the appropriate and applicable infrastructure facilities and services essential to the proposed residential uses. Additionally, the Project would represent a reasonable extension of the existing pattern of infrastructure facilities and services in the surrounding area. As outlined in Table 5.1-1, *Summary of Land Uses*, existing IL-1 areas are located north, south, east and west of the Project site. The extension of facilities and services consistent with IL-1 standards was anticipated for the Project site and the Project would not be growth inducing in this regard.

The *Growth Management* section of the General Plan focuses on ways to monitor and manage future growth of the County in order to preserve valuable resources and maintain a high quality of life for all residents. In order to anticipate the cost of providing services to future development, the General Plan divides the County into three broad development areas (urban, rurban, and rural) based on the factors outlined below. These development area designations then define the types of uses that are allowed, enabling the County to anticipate the types of services they will need to provide.

- Existing and anticipated level of development and level of build-out at planned densities.
- Current lot pattern/sizes.
- Proximity to water and sewer District service boundaries and capability for providing future service to designated areas.
- Availability of public services and the carrying capacity of existing infrastructure facilities.
- Proposed expansion/extension of existing, and development of new facilities.
- Hazards.
- Carrying capacity of existing natural resources.
- The extent and potential for damage to significant environmental resources.

- Spheres of influence/city boundaries.

Urban Areas (UA) are areas that are committed or planned for higher density/ intensity uses. A full range of public facilities and services (including water, sewer, roads, flood control/drainage, police and fire services, etc.) shall be focused on these areas. Urban areas include:

- Areas surrounded by incorporated cities.
- Areas adjacent to incorporated cities, generally divided into parcels 5,000 square feet up to one (1) acre, and served by a water purveyor.
- Areas within the sphere of influence of incorporated cities.

Urban areas should be suitable for urban land uses. The following Land Use Districts can be located within urban areas[5]:

- Single Residential RS
- Multiple Residential RM
- Office Commercial CO
- Neighborhood Commercial CN
- General Commercial CG
- Service Commercial CS
- Community Industrial IC
- Regional Industrial IR

Rurban Areas (RB) are designed to accommodate residential development opportunities for those who desire ex-urban, low density, or country living environment and are willing to assume the costs of providing many of their own services and amenities. The low intensities accommodated in this district generally permit onsite septic systems and wells, thereby reducing public expenditures. These areas are not expected to be converted to higher intensities in the future; they are expected to be built as currently designated. Rurban areas are areas that meet one or more of the following criteria:

- Areas adjacent to incorporated cities, generally divided into parcels of 1.0 acre up to 5.0 acres.
- Areas in remote locations with limited access already subdivided into parcels that are less than 5.0 acres.
- Areas where onsite disposal systems may be permitted.

The following Land Use Districts can be located in Rurban Areas:

- Rural Living RL
- Single Residential RS (1 acre min. parcel size)
- Neighborhood Commercial CN

[5] The Planned Development (PD), Institutional (IN) and Floodway (FW) Districts can be located in any of the three areas.

- Service Commercial CS
- Community Industrial IC
- Highway Commercial CH

Rural Areas (RA) are comprised of agricultural and unimproved lands and low-intensity residential development. These areas are not required for urban development at the present time and, according to current population projections, will not be required (for urban development) in the next twenty years. There is generally a long-term commitment to maintain a rural lifestyle in these areas. Although certain basic public services and facilities are available to these areas, few, if any, urban services are either available, planned or encouraged. Rural areas are defined as lands which are generally suitable for lower density/ intensity land uses because they meet one or more of the following criteria:

- Used for agriculture, general open space or as a watershed for a public water supply.

- Isolated subdivided areas and commercial centers which are not adjacent to incorporated cities.

- Divided into parcels of 5.0 acres or larger, next to an urban incorporated area.

- Subdivided areas that use onsite wastewater management systems that are adjacent to, but not surrounded by incorporated areas.

The following Land Use Districts can be located in Rural Areas:

- Resource Conservation RC
- Agriculture AG
- Rural Living RL
- Neighborhood Commercial CN
- Service Commercial CS
- Rural Commercial CR
- Highway Commercial CH

The Project site is located within a designated Urban Area. As previously noted, the Project proposes a Land Use District Change to RS which is a permitted land use District in an UA. Thus, growth commensurate with the proposed Project was anticipated for the Project site and the Project would not be considered growth inducing in this regard.

Overall, the proposed development would not require the substantial development of unplanned/unforeseen support uses and services as is evidenced by the site's and the surrounding area's existing IL-1 and UA designations. As a result, the proposed project would not result in significant growth-inducing impacts.

7.0 Alternatives to the Proposed Project

7.0 ALTERNATIVES TO THE PROPOSED PROJECT

In accordance with California Environmental Quality Act (CEQA) Guidelines Section 15126.6, the following Section describes a range of reasonable alternatives to the proposed Project which could feasibly attain the basic project objectives and would avoid or substantially lessen any of the significant effects. The evaluation also reviews the comparative merits of each alternative. The analysis focuses on alternatives capable of eliminating significant adverse environmental effects or reducing significance, even if these alternatives would impede, to some degree, the attainment of the project objectives. Potential environmental impacts associated with four separate alternatives are compared to impacts from the proposed Project below. These alternatives include the "No Project/No Development" Alternative, "No Project/Existing Designation" Alternative, "Reduced Density, Without Road Realignment and Without Marina" Alternative and "Reduced Density, With Project Redesign" Alternative. The "No Project" Alternative scenario is a requirement in an EIR pursuant to Section 15126.6(e) of CEQA. Refer to Table 7-1, *Comparison of Alternatives*, which is an impact matrix comparing the Alternatives to the proposed Project. The Environmentally Superior Alternative is identified and discussed in Section 7.5.

7.1 "NO PROJECT/NO DEVELOPMENT" ALTERNATIVE

DESCRIPTION OF ALTERNATIVE

Implementation of the "No Project/No Development" Alternative would retain the site in its current condition. None of the improvements proposed as part of the project and/or the existing designation would occur. The following discussion evaluates the potential environmental impacts associated with the No Project/No Development Alternative as compared to impacts from the proposed Project.

IMPACT COMPARISON TO THE PROPOSED PROJECT

Land Use and Relevant Planning

According to the County of San Bernardino General Plan Map, the project site is designated as Rural Living (RL-40), with the exception of the State Route 38 right-of-way. Under the No Project/No Development Alternative no development would occur onsite. The existing General Plan designation (RL-40) would remain and an amendment to the Official Land Use District would not occur. With no development occurring within the project site, it would remain in its existing undeveloped condition. It is further noted that it is not the intent of the County to preclude development from occurring within the project site.

Recreation

Since no new residents would be generated by this Alternative, no new demands would be placed on Big Bear Lake or local and regional park facilities in the area.

This Alternative would retain existing on-site paths/trails. However, public access on the site and to the lakefront would not be assured since the Project site is private property. Additionally, this Alternative would not involve the construction of any recreational facilities (i.e., marina facilities). The No Project/No Development Alternative would be considered environmentally superior to the proposed Project.

Table 7-1
Comparison of Alternative Environmental Impacts with Proposed Project

Issue	No Project/No Development	No Project/ Existing Designation	Reduced Density, Without Road Realignment and Without Marina	Reduced Density, With Project Redesign
Land Use and Relevant Planning	□	□	□	=
Recreation	□	□	=	=
Fire and Police Protection	□	=	=	=
Schools	□	□	□	□
Libraries	□	□	=	=
Water and Sewer	□	=	=	=
Solid Waste	□	□	=	=
Utilities	□	□	□	□
Aesthetics/Light and Glare	□	□	□	□
Traffic and Circulation	□	□	□	□
Air Quality	□	□	□	□
Noise	□	□	□	□
Biological Resources	□	□	□	□
Cultural Resources	□	□	□	□
Geology and Soils	□	□	□	=
Hydrology and Drainage	□	□	=	=

= Impact is equivalent to impact of proposed Project (neither environmentally superior nor inferior).
□ Impact is less than impact of proposed Project (environmentally superior).
■ Impact is greater than impact of proposed Project (environmentally inferior).

Public Services and Utilities

Fire and Police Protection. The No Project/No Development Alternative would not involve new residences; thus, no new demand for fire and police protection services over existing conditions would be required. The No Project/No Development Alternative would be considered environmentally superior to the proposed Project.

Schools. The No Project/No Development Alternative would not generate additional school children and would not place demands on the school district serving the sites. Thus, this Alternative would not strain current educational resources. Compared to the proposed Project, the No Project/No Development Alternative would be considered environmentally superior.

Libraries. The No Project/No Development Alternative would not generate additional residents and would not place demands on libraries serving the project site. Thus, this Alternative would not impact current resources. Since the proposed Project would create minimal demands on library resources, the No Project/No Development Alternative would be considered environmentally superior to the proposed Project.

Water and Sewer. The No Project/No Development Alternative would not involve development within the project area. Consequently, the need to extend water and sewer lines to the project site would not occur under this Alternative. Compared to the proposed Project, the No Project/No Development Alternative would be considered environmentally superior.

Solid Waste. The No Project/No Development Alternative would not produce new generators of solid waste, and would not impact existing County landfills. The No Project/No Development Alternative would be considered environmentally superior to the proposed Project.

Utilities. The No Project/No Development Alternative would not increase the demand for utility services beyond existing levels. The No Project/No Development Alternative would be considered environmentally superior to the proposed Project.

Aesthetics/Light and Glare

The visual character of the site, which consists of undeveloped forested land would remain unchanged, and no site grading would occur. Existing views of Big Bear Lake and the distant mountain ranges to the south would not be obstructed from the project site, which includes views from State Route 38. In addition, lighting impacts would be eliminated, as no new light sources would be introduced onto the project site. Compared to the proposed Project, the No Project/No Development Alternative would be considered environmentally superior.

Traffic and Circulation

The No Project/No Development Alternative would not result in the realignment of State Route 38 and would not create new interior roads within the project area. This Alternative would not increase project-related traffic above current levels. However, the realignment of State Route 38 would be considered as a circulation improvement since the roadway would be straightened to reduce safety hazards. Due to the reduction in traffic generation, the No Project/No Development Alternative would be considered environmentally superior to the proposed Project.

Air Quality

No new long-term sources of air pollution would result from increased traffic, watercraft uses, wood burning fireplaces and the increased use of energy sources. The No Project/No Development Alternative would be considered environmentally superior to the proposed Project.

Noise

The noise increases created by project-related traffic and watercraft on Big Bear Lake would not occur under this Alternative. The No Project/No Development Alternative would be considered environmentally superior to the proposed Project.

Biological Resources

The impacts to plants and wildlife would not occur under this Alternative. The No Project/No Development Alternative would be considered environmentally superior to the proposed Project.

Cultural Resources

The impacts to cultural resources would not occur under this Alternative. The No Project/No Development Alternative would be considered environmentally superior to the proposed Project.

Geology and Soils

The No Project/No Development Alternative would not involve development within the project area. Consequently, no new structures would be subject to seismic hazards, such as ground shaking or seismically induced settling. Compared to the proposed Project, the No Project/No Development Alternative would be considered environmentally superior.

Hydrology and Drainage

The No Project/No Development Alternative would not involve development within the project area. Thus, no groundwater source would be extracted and no new sources of stormwater runoff would be created. Compared to the proposed Project, the No Project/No Development Alternative would be considered environmentally superior.

ABILITY TO MEET PROJECT OBJECTIVES

The No Project/No Development Alternative would not result in any of the environmental impacts associated with the proposed construction and development of the proposed Project. This Alternative would avoid potential impacts resulting from alterations of the project sites' physical characteristics and construction of new structures and uses. Maintaining the Project site in its existing condition would not alter the visual characteristic of the Project site. The No Project/No Development Alternative would eliminate recreation, aesthetic, public services and utilities, traffic

and circulation, air quality, noise, biological resources, cultural resources, geology, soils, hydrology and groundwater impacts associated with the proposed Project. However, this Alternative is not consistent with the Project objectives, which are to provide up to 92 single-family residential lots, to be developed as custom lots in the future. The Project also seeks realignment of North Shore Drive to improve the design of the roadway, which would also allow for lakefront lots to be developed.

7.2 "NO PROJECT/EXISTING DESIGNATION" ALTERNATIVE

DESCRIPTION OF ALTERNATIVE

Implementation of the "No Project/Existing Designation" Alternative would be in accordance with the existing Official Land Use District Rural Living-40 (40-acre minimum lot size). This Alternative would result in 1.5 residential lots on the project site. This Alternative would be less intensive than the proposed Project. Approximately three persons (1.5 housing units x 2.15 persons/household) would be added to the permanent population of the Community of Fawnskin. It is further noted that in addition to a single-residential structure, other uses can be allowed including those in the "Additional Uses" section of the County Development Code, subject to a Conditional Use Permit. The following discussion evaluates the potential environmental impacts associated with the No Project/Existing Designation Alternative as compared to impacts from the proposed Project.

IMPACT COMPARISON TO THE PROPOSED PROJECT

Land Use and Relevant Planning

According to the County of San Bernardino General Plan Map, the project site is designated as Rural Living (RL-40), with the exception of the State Route 38 right-of-way. Under the No Project/Existing Designation Alternative, dwelling units consistent with the Rural Living (RL-40) land use designation would be developed. The existing General Plan designation (RL-40) would remain and an amendment to the Official Land Use District would not be processed. The No Project/Existing Designation Alternative would be considered environmentally superior to the proposed Project.

Recreation

Approximately three new residents would be generated by this Alternative. This nominal increase in population would not create new demands on Big Bear Lake or local and regional park facilities in the area. Unlike the proposed Project, this Alternative would not involve the construction of any recreational facilities (i.e., marina facilities). This Alternative would retain existing on-site paths/trails. However, public access on the Project site and to the lakefront would not be assured since the Project site is private property. The No Project/Existing Designation Alternative would be considered environmentally superior to the proposed Project.

Public Services and Utilities

Fire and Police Protection. The No Project/Existing Designation Alternative would result in development of 1.5 residential lots on the project site; thus, a nominal increase in the demand for fire and police protection services would occur over existing conditions. Similar to the proposed Project, this Alternative would not result in the need for expansion or construction of police or fire protection facilities. The No Project/Existing Designation Alternative would be considered neither environmentally superior or inferior to the proposed Project.

Schools. The No Project/Existing Designation Alternative would generate approximately one school child (.20 students x 1.5 dwelling units), which is approximately 17 fewer school children than the proposed Project. Since existing school enrollments exceed the capacity at all three schools that would serve the project site, increases in students would further strain resources. Since the No Project/Existing Designation Alternative would generate less impact on existing educational resources, it would be considered environmentally superior to the proposed Project.

Libraries. The No Project/Existing Designation Alternative would generate approximately three additional residents; however, as with the proposed Project, the addition of three new residents would not significantly impact libraries serving the project site. The No Project/Existing Designation Alternative would be considered environmentally superior to the proposed Project.

Water and Sewer. Given that the No Project/Existing Designation Alternative would result in development of 1.5 residential lots on the project site, the need to extend water and sewer lines to the project site would be less of an impact than with the proposed Project. Since water supplies and existing reservoir facilities in the Big Bear Valley are limited, this Alternative would produce less impact to the resource. This Alternative would result in similar water service impacts due to the inability of providers to confirm service. Thus, compared to the proposed Project, the No Project/Existing Designation Alternative would not be considered to be environmentally superior or inferior to the proposed project.

Solid Waste. The No Project/Existing Designation Alternative would produce less solid waste when compared to the proposed Project. However, this Alternative, as with the proposed Project, would not result in significant impacts to existing landfills. The No Project/Existing Designation Alternative would be considered environmentally superior to the proposed Project.

Utilities. The No Project/Existing Designation Alternative would result in a nominal increase in demand for utility services (i.e., gas, electric) beyond existing levels and at levels less than those of the proposed Project. The need for modification and addition of utilities into the project site would be less than for the proposed Project. The No Project/Existing Designation Alternative would be considered environmentally superior to the proposed Project.

Aesthetics/Light and Glare

The visual character of the site, which consists of undeveloped forest land, would be slightly modified under the No Project/Existing Designation Alternative. Given that this Alternative proposes only 1.5 residential lots and no realignment of State Route 38, fewer impacts are anticipated with respect to landform alteration, aesthetics and light and glare. The development of 1.5 lots designated for residential uses would not involve the extensive removal of Jeffrey pine trees. Although trees may be removed onsite, the property would retain its forested nature. The No Project/Existing Alternative would maintain the views of Big Bear Lake and distant mountain ranges to the south from State Route 38 and surrounding land uses. Big Bear Lake would remain in its current aesthetic condition, as no recreational facilities on the Lake would occur with this Alternative. Thus, compared to the proposed Project, the No Project/No Development Alternative would be considered environmentally superior.

Traffic and Circulation

The No Project/Existing Designation Alternative would not result in the realignment of State Route 38, would not create new interior roads within the project area and would nominally increase project-related traffic above current levels. Similar to the proposed Project, this Alternative would contribute to the existing intersection deficiency at Stanfield Cutoff and Big Bear Boulevard. However, this Alternative would result in fewer new trips on the local road system when compared to the proposed Project. The No Project/Existing Designation Alternative would be considered environmentally superior to the proposed Project.

Air Quality

Fewer vehicular trips would be generated under this Alternative than for the proposed Project, which would also produce less mobile and energy source emissions. With fewer homes, less particulate emissions would be generated. This Alternative would result in fewer local and regional air pollutant emissions. Additionally, construction-related emissions from the realignment of State Route 38 would not occur with this Alternative. Thus, the No Project/Existing Designation Alternative would be considered environmentally superior to the proposed Project.

Noise

Given that approximately 90 less residential lots would occur under this Alternative, long-term noise levels associated with vehicular traffic would be less than the noise levels under the proposed Project. Additionally, this Alternative does not include new marina facilities, which in turn, would not produce new noise sources from watercraft utilizing Big Bear Lake. Additionally, construction-related noise from the realignment of State Route 38 would not occur with this Alternative. The No Project/Existing Designation Alternative would be considered environmentally superior to the proposed Project.

Biological Resources

The No Project/Existing Designation Alternative would impact existing on-site biological resources with the development of 1.5 residential lots, as compared to 92 residential lots of the proposed Project. While this Alternative could result in removal of trees for the development of 1.5 residential lots, the proposed Project would remove approximately 655 trees, or 24 percent of the existing 2,772 trees for roadway construction. The proposed Project could also involve additional tree removal during individual lot development and construction of custom homes. This Alternative would not involve a marina facility which would result in no impacts to Big Bear Lake in this regard. The No Project/Existing Designation Alternative would be considered environmentally superior to the proposed Project.

Cultural Resources

Development under either the proposed Project or the No Project/Existing Designation Alternative has the potential to impact on-site cultural resources. Although the proposed Project would alter a greater quantity of land than the No Project/Existing Designation Alternative, both would require monitoring by qualified archeological and/or paleontological experts. Thus, the No Project/No Development Alternative would be considered neither environmentally superior or inferior to the proposed Project.

Geology and Soils

Under this Alternative, less residents and structures would be exposed to seismic hazards than the proposed Project. The proposed Project would involve grading for the realignment of State Route 38 and for structures to the north and south (lakefront) of State Route 38. Grading required for this Alternative would occur for development of 1.5 residential lots. The amount of grading associated with this Alternative would result in less potential impacts resulting from slope stability than the proposed Project. Compared to the proposed Project, the No Project/Existing Designation Alternative would be considered environmentally superior.

Hydrology and Drainage

The No Project/Existing Designation Alternative would involve less development in the project area than the proposed Project. The amount of impermeable surface area (i.e., roads, driveways, etc) would be less with this Alternative than the proposed Project. Additionally, this Alternative would involve fewer residences and vehicles on-site, thus reducing sources of stormwater pollution runoff. The groundwater overdraft condition noted for the proposed project may still occur with this Alternative, but at a significantly reduced rate. Compared to the proposed Project, the No Project/Existing Designation Alternative would be considered environmentally superior.

ABILITY TO MEET PROJECT OBJECTIVES

The No Project/No Development Alternative would decrease the intensity of the environmental impacts associated with the proposed construction and development

of the proposed Project. This Alternative would decrease potential impacts resulting from alterations of the Project sites' physical characteristics and construction of new structures and uses. By not realigning State Route 38 and not removing the amount of trees associated with the proposed Project, the project site would maintain the majority of its existing condition and the visual character of the Project site would not be significantly altered. The No Project/Existing Designation Alternative would reduce impacts to recreation, public services and utilities, aesthetics, traffic and circulation, air quality, noise, biological resources, geology/soils, hydrology/drainage and groundwater associated with the proposed Project. However, while meeting the objectives established in the County General Plan, this Alternative does not meet the objectives established for the proposed Project, which are to provide up to 92 single-family residential lots, to be developed as custom lots in the future. The Project also seeks realignment of North Shore Drive in order to improve the design of the roadway, which would also allow for lakefront lots to be developed.

7.3 "REDUCED DENSITY, WITHOUT ROAD REALIGNMENT AND WITHOUT MARINA" ALTERNATIVE

DESCRIPTION OF ALTERNATIVE

For the Reduced Density, Without Road Realignment and Without Marina Alternative, development of 62 residential lots and associated infrastructure (as depicted in the project description) would occur on the north side of the existing State Route 38 alignment. State Route 38 would not be realigned and no residential development would occur to the south of State Route 38. The land area south of State Route 38, along the lakefront, would be retained in its current state. Approximately 133 persons (62 housing units x 2.15 persons/household) would be added to the permanent population of the Community of Fawnskin.

IMPACT COMPARISON TO THE PROPOSED PROJECT

Land Use and Relevant Planning

As with the proposed Project, this Alternative would require an amendment to the Official Land Use District designation of the project site, per the County of San Bernardino General Plan. Currently, the project site is designated as Rural Living (RL-40). Under the Reduced Density, Without Road Realignment and Without Marina Alternative, as well as the proposed Project, development onsite would not be consistent with the Rural Living (RL-40) land use designation. Development would include 62 residential lots and associated infrastructure under the Single Residential (RS-7200) land use designation. This Alternative would not include realignment of State Route 38, thus no amendment to the Circulation Element of the General Plan would occur. Similar to the proposed Project, development standards under this Alternative would be required to be consistent with the provisions of the Geologic Hazard, Fire Safety, Biotic Resources and Scenic Resources Overlay District provisions/requirements in the San Bernardino Development Code. Per the provisions of the Geologic Hazard, Fire Safety, and Biotic Resources Overlay

Districts, either the proposed Project or this Alternative would result in less than significant impacts, with compliance of the development standards outlined in the Development Code and mitigation measures referenced in the applicable technical reports (i.e., geology/soils and biological reports). This Alternative would not result in obstructed views of Big Bear Lake and distant mountain ranges from the lakefront and/or State Route 38. Hence, this Alternative would be consistent with development standards set forth in the Scenic Resources Overlay District. The Reduced Density, Without Road Realignment and Without Marina Alternative would be considered environmentally superior to the proposed Project.

Recreation

This Alternative would not include residential development along the lakefront. The lakefront would remain in its existing condition. Public access on the site and to the lakefront would not be assured since the Project site is private property. This Alternative and the proposed Project would result in the loss of trails within the forested areas to the north from the project site. Neither this Alternative, nor the proposed Project would increase the use of existing parks or recreational facilities such that substantial physical deterioration would occur. The Reduced Density, Without Road Realignment and Without Marina Alternative would be considered neither environmentally superior nor inferior to the proposed Project.

Public Services and Utilities

Fire and Police Protection. The Reduced Density, Without Road Realignment and Without Marina Alternative would result in development of 62 residential lots, as compared to 92 residential lots with the proposed Project. Development under this Alternative or the proposed Project would increase the demand for fire and police protection services over existing conditions. Similar to the proposed Project, this Alternative would not result in the need for expansion or construction of police or fire protection facilities. The Reduced Density, Without Road Realignment and Without Marina Alternative would be considered neither environmentally superior nor inferior to the proposed Project.

Schools. The Reduced Density, Without Road Realignment and Without Marina Alternative would generate approximately 12 school children (.20 x 62 dwelling units), which is six fewer school children than the proposed Project. Since existing school enrollments currently exceed the capacity at all three schools that would serve the project site, increases in students would further impact resources. Since the Reduced Density, Without Road Realignment and Without Marina Alternative would generate less impact on existing educational resources, it would be considered environmentally superior to the proposed Project.

Libraries. The Reduced Density, Without Road Realignment and Without Marina Alternative would generate approximately 133 residents; however, as with the proposed Project, the addition of these new residents would not significantly impact libraries serving the project site. The Reduced Density, Without Road Realignment and Without Marina Alternative would be considered neither environmentally superior or inferior to the proposed Project.

Water and Sewer. Given that the Reduced Density, Without Road Realignment and Without Marina Alternative would result in development of 62 residential lots on the project site, the need to increase water supply and treatment and/or storage facilities would be less of an impact than with the proposed Project. Since water supplies and existing reservoir facilities in the Big Bear Valley are limited, this Alternative, when compared to the proposed Project, would result in a reduced impact on currently strained resources. This Alternative would result in similar water service impacts due to the inability of providers to confirm service. On this basis, when compared to the proposed Project, the Reduced Density, Without Road Realignment and Without Marina Alternative would not be considered to be environmentally superior or inferior to the proposed Project.

Solid Waste. The Reduced Density, Without Road Realignment and Without Marina Alternative would produce less solid waste when compared to the proposed Project. However, this Alternative, as with the proposed Project, would not create impacts to existing landfills. The Reduced Density, Without Road Realignment and Without Marina Alternative would be considered neither environmentally superior or inferior to the proposed Project.

Utilities. The Reduced Density, Without Road Realignment and Without Marina Alternative would increase the demand for utility services (i.e., gas, electric) beyond existing levels but, at levels less than those of the proposed Project. The need for modification and addition of utilities would be less than for the proposed Project. The Reduced Density, Without Road Realignment and Without Marina Alternative would be considered environmentally superior to the proposed Project.

Aesthetics/Light and Glare

As with the proposed Project, the visual character of the site, which consists of undeveloped forest land, would be modified under the Reduced Density, Without Road Realignment and Without Marina Alternative. Given that this Alternative involves development to the north of State Route 38 and no realignment of State Route 38, fewer Aesthetic impacts are anticipated with respect to landform alteration, aesthetics and light and glare. Since this Alternative does not involve residential lot development south of State Route 38, views of Big Bear Lake and the distant mountain ranges from State Route 38 would be retained. Although existing views of the Lake and mountains to the south, from Flicker Road, may still be obstructed with this Alternative, surrounding uses to the east and west would retain views of the Lake and mountains. Furthermore, residential lot development associated with the proposed Project would limit public access to the lakefront and change the visual character of the site from a forested, undeveloped nature to a developed residential area. Compared to the proposed Project, the Reduced Density, Without Road Realignment and Without Marina Alternative would be considered environmentally superior.

Traffic and Circulation

When compared to the proposed Project, the Reduced Density, Without Road Realignment and Without Marina Alternative would not result in the realignment of State Route 38 and would generate less traffic on surrounding roadways. This Alternative would result in fewer new trips on the local road system when compared

to the proposed Project. However, both the proposed Project and this Alternative would contribute to the existing intersection deficiency at Stanfield Cutoff and Big Bear Boulevard. The proposed Project and this Alternative would be required to pay "fair-share" fees to mitigate respective contributions to the existing intersection deficiency. The Reduced Density, Without Road Realignment and Without Marina Alternative would be considered environmentally superior to the proposed Project.

Air Quality

Fewer vehicular trips would be generated under this Alternative than for the proposed Project, which would also produce less mobile and energy source emissions. With fewer homes, less particulate emissions would be generated. This Alternative would result in fewer local and regional air pollutant emissions. Additionally, construction-related emissions from the realignment of State Route 38 would not occur with this Alternative. Thus, the Reduced Density, Without Road Realignment and Without Marina Alternative would be considered environmentally superior to the proposed Project.

Noise

Given that approximately 30 less residential lots would occur under this Alternative, long-term noise levels associated with vehicular traffic would be less than the noise levels under the proposed Project. Additionally, construction-related noise from the realignment of State Route 38 would not occur with this Alternative. The Reduced Density, Without Road Realignment and Without Marina Alternative would be considered environmentally superior to the proposed Project.

Biological Resources

The conversion of undeveloped forest land and impacts to biological resources north of State Route 38 would be similar to the proposed project. This Alternative would not modify existing habitat to the south of Highway 38. Thus, no physical impacts to biological resources to the south of Highway 38 would occur. Compared to the proposed Project, the Reduced Density, Without Road Realignment and Without Marina Alternative would be considered environmentally superior.

Cultural Resources

Development under either the proposed Project or the Reduced Density, Without Road Realignment and Without Marina Alternative has the potential to impact on-site cultural resources. Although the proposed Project would alter a greater quantity of land than the Reduced Density, Without Road Realignment and Without Marina Alternative, both would require monitoring by qualified archeological and/or paleontological experts. Thus, the No Project/No Development Alternative would be considered neither environmentally superior or inferior to the proposed Project.

Geology and Soils

Under this Alternative, less residents and structures would be exposed to seismic hazards than the proposed Project. Unlike this Alternative, the proposed Project

would involve grading for the realignment of State Route 38 and for structures to the north and south (lakefront) of State Route 38. Grading required for this Alternative would occur for development of approximately 62 residential lots north of State Route 38. The amount of grading associated with this Alternative would create similar potential impacts from slope stability as the proposed Project, since both descriptions would develop homes on the steepest portions (northern half) of the site. Compared to the proposed Project, the Reduced Density, Without Road Realignment and Without Marina Alternative would be considered environmentally superior.

Hydrology and Drainage

The Reduced Density, Without Road Realignment and Without Marina Alternative would involve less development within the project area than the proposed Project. The amount of impermeable surface area (i.e., roads, driveways, etc) would be less with this Alternative than the proposed Project. Additionally, this Alternative would involve fewer residences and vehicles on-site, thus reducing pollution sources of stormwater runoff. The overdraft condition noted for the proposed Project may still occur and based on 62 units of development would result in consistent groundwater affects. Compared to the proposed Project, the Reduced Density, Without Road Realignment and Without Marina Alternative would be neither environmentally superior nor inferior.

ABILITY TO MEET PROJECT OBJECTIVES

The Reduced Density, Without Road Realignment and Without Marina Alternative would decrease the intensity of the environmental impacts associated with the proposed construction and development of the proposed Project. This Alternative would decrease potential impacts resulting from alterations of the Project sites' physical characteristics and construction of new structures and uses. By not realigning State Route 38 and not removing the number of trees associated with the proposed Project, the site would maintain the existing forested nature and visual character south of State Route 38. Views of the Lake and mountain ranges would be retained from State Route 38 and from uses to the east and west of the project site. The Reduced Density, Without Road Realignment and Without Marina Alternative would reduce impacts to public services and utilities, aesthetics, traffic and circulation, air quality, noise, biological resources, geology and soils and hydrology and drainage when compared to the proposed Project. Groundwater affects would be consistent with conclusions rendered for the proposed Project. This Alternative does not meet the entire objectives established for the proposed Project which is to provide up to 92 single-family residential lots to be developed as custom lots in the future. The proposed Project also seeks to provide a marina facility and realign of North Shore Drive in order to improve the design of the roadway, which would also allow for lakefront lots to be developed.

7.4 "REDUCED DENSITY, WITH PROJECT REDESIGN" ALTERNATIVE

DESCRIPTION OF ALTERNATIVE

For the Reduced Density, With Project Redesign Alternative, development of 66 residential lots and associated infrastructure would occur on project site. Implementation of this Alternative would include the realignment of State Route 38. Twenty-one (21) and 45 lots would be developed on the south and north sides of the realigned State Route 38, respectively. This Alternative would include a marina facility, with 72 boat slips. Approximately 142 persons (66 housing units x 2.15 persons/household) would be added to the permanent population of the Community of Fawnskin.

IMPACT COMPARISON TO THE PROPOSED PROJECT

Land Use and Relevant Planning

As with the proposed Project, this Alternative would require an amendment to the Official Land Use District designation of the project site, per the County of San Bernardino General Plan. Currently, the project site is designated as Rural Living (RL-40). Under the Reduced Density, With Project Redesign Alternative, as well as the proposed Project, development onsite would not be consistent with the Rural Living (RL-40) land use designation. Development would include 66 residential lots and associated infrastructure under the Single Residential (RS-7200) land use designation. This Alternative would include realignment of State Route 38, thus an amendment to the Circulation Element of the General Plan would be required. Similar to the proposed Project, development standards under this Alternative would be required to be consistent with the provisions of the Geologic Hazard, Fire Safety, Biotic Resources and Scenic Resources Overlay Districts in the San Bernardino Development Code. Per the provisions of the Geologic Hazard, Fire Safety, and Biotic Resources Overlay Districts, either Alternative would result in similar less than significant impacts with compliance of the development standards outlined in the Development Code and identified mitigation measures in the appropriate technical reports (i.e., geology/soils and biological reports). Similar to the proposed Project, this Alternative would result in obstructed views of Big Bear Lake and the distant mountain ranges from the portion of the lakefront and/or State Route 38 that traverses the project site. Thus, this Alternative would not be consistent with the developments standards set forth in the Scenic Resources Overlay District. The Reduced Density, With Project Redesign Alternative would be considered neither environmentally superior nor inferior to the proposed Project.

Recreation

Similar to the proposed Project, this Alternative would include residential development along the lakefront. The shoreline/lakefront would be developed with residential uses (21 dwelling units) and would include marina facilities (Lot "C") which would be located south of North Shore Drive. Public access to the lakeshore would be maintained at the eastern and western boundaries of the site. However, public

access on the site and to the lakefront would not be assured since the Project site is a private property. This Alternative and the proposed Project would include the loss of trails and access to the forested areas to the north from the project site. This Alternative would include a 72-boat slip marina facility. The increase in boats on the Lake would not impact the boating capacity of the Lake. Neither this Alternative, nor the proposed Project would increase the use of existing parks or recreational facilities such that substantial physical deterioration would occur. The Reduced Density, With Project Redesign Alternative would be considered neither environmentally superior nor inferior to the proposed Project.

Public Services and Utilities

Fire and Police Protection. The Reduced Density, With Project Redesign Alternative would result in development of 66 residential lots, as compared to 92 residential lots within the proposed Project. Development under this Alternative or the proposed Project would result in a nominal increase in the demand for fire and police protection services over existing conditions. Similar to the proposed Project, this Alternative, would not result in the need for expansion or construction of police or fire protection facilities. The Reduced Density, With Project Redesign Alternative would be considered neither environmentally superior nor inferior to the proposed Project.

Schools. The Reduced Density, with Project Redesign Alternative would generate approximately 13 school children (.20 x 66 dwelling units), which is five fewer school children than the proposed Project. Since existing school enrollments currently exceed the capacity at all three schools that would serve the project site, increases in students would further impact resources. Since the Reduced Density, With Project Redesign Alternative would generate less strain on existing educational resources, it would be considered environmentally superior to the proposed Project.

Libraries. The Reduced Density, With Project Redesign Alternative would generate approximately 142 residents; however, as with the proposed Project, the addition of these new residents would not significantly impact libraries serving the project site. The Reduced Density, With Project Redesign Alternative would be considered neither environmentally superior nor inferior to the proposed Project.

Water and Sewer. Given that the Reduced Density, With Project Redesign Alternative would allow development of 66 residential lots on the project site, the need to increase water supply and treatment and/or storage facilities would be less of an impact than with the proposed Project. Since water supplies and existing reservoir facilities in the Big Bear Valley are limited, this Alternative, when compared to the proposed Project, would produce less impact on currently strained resources. This Alternative would result in similar water service impacts due to the inability of providers to confirm service. On this basis, when compared to the proposed Project, the Reduced Density, With Project Redesign Alternative would not be considered to be environmentally superior or inferior to the proposed Project.

Solid Waste. The Reduced Density, With Project Redesign Alternative would produce less solid waste when compared to the proposed Project. However, this Alternative, as with the proposed Project, would not create impacts to existing

landfills. The Reduced Density, With Project Redesign Alternative would be considered neither environmentally superior nor inferior to the proposed Project.

Utilities. The Reduced Density, With Project Redesign Alternative would increase the demand for utility services (i.e., gas, electric) beyond existing levels but, at levels less than those of the proposed Project. Given the density of this Alternative, the need for modification and addition of utilities would be less than for the proposed Project. The Reduced Density, With Project Redesign Alternative would be considered environmentally superior to the proposed Project.

Aesthetics/Light and Glare

As with the proposed Project, the visual character of the site, which consists of undeveloped forest land, would be modified under the Reduced Density, With Project Redesign Alternative. Given that this Alternative proposes development to the north and south of State Route 38 and the realignment of State Route 38, similar impacts are anticipated with respect to landform alteration, aesthetics and light and glare. Since this Alternative would involve decreased residential densities to the south of State Route 38, views of Big Bear Lake and the distant mountain ranges from State Route 38 would not be as obstructed when compared to the proposed Project. Residential lot development associated with this Alternative, as well as the proposed Project, would limit public access to the lakefront and change the visual character of the site from a forested, undeveloped nature to a developed residential area. As with the proposed project, this Alternative would alter the visual character of the Lake with implementation of the marina facilities. Thus, similar to the proposed Project, the Reduced Density, With Project Redesign Alternative would change the visual character of the project area and adversely impact views of the lake and the distant mountain ranges. However, since residential lot densities along the lakefront would be reduced in comparison to the proposed Project, providing increased viewing opportunities of the lake and distant mountain ranges, this Alterative is considered environmentally superior to the proposed Project.

Traffic and Circulation

As compared to the proposed Project, the Reduced Density, With Project Redesign Alternative would also result in the realignment of State Route 38, but would generate less project-related traffic above current levels. This Alternative would result in fewer new trips on the local road system when compared to the proposed Project. However, both the proposed Project and this Alternative would contribute to the existing intersection deficiency at Stanfield Cutoff and Big Bear Boulevard. The proposed Project and this Alternative would likely pay “fair-share” fees to mitigate their respective contribution to the existing intersection deficiency. The Reduced Density, With Project Redesign Alternative would be considered environmentally superior to the proposed Project.

Air Quality

Fewer vehicular trips would be generated under this Alternative than for the proposed Project, which would produce less mobile and energy source emissions. Additionally, with fewer homes, less particulate emissions would be generated.

This Alternative would result in fewer local and regional air pollutant emissions. Thus, the Reduced Density, With Project Redesign Alternative would be considered environmentally superior to the proposed Project.

Noise

Given that 26 less residential lots would occur under this Alternative, long-term noise levels associated with vehicular traffic would be less than the noise levels under the proposed Project. Additionally, this Alternative would include a 72 boat slip marina facility, compared to a 100-boat slip marina with the proposed Project, which in turn, would produce less new noise sources from watercraft utilizing Big Bear Lake. Thus, compared to the proposed Project, the Reduced Density, With Project Redesign Alternative would be considered environmentally superior.

Biological Resources

The Reduced Density, With Project Redesign Alternative would impact existing on-site biological resources similar to the proposed Project. Both the proposed Project and this Alternative could involve additional tree removal during individual lot development and construction of custom homes. Additionally, both the proposed Project and this Alternative would remove approximately 655 trees, or 24 percent of the existing 2,772 trees for realignment of Route 38. Since residential lot densities would be reduced in comparison to the proposed Project, it is anticipated that residential homesite design can account for tree locations and substantially reduce the number to be removed for lot development and thus, reduce impacts to biological resources such as the bald eagle. Thus, the Reduced Density, With Project Redesign Alterative is considered environmentally superior to the proposed Project.

Cultural Resources

Development under either the proposed Project or the Reduced Density, With Project Redesign Alternative has the potential to impact on-site cultural resources. Although the proposed Project would alter a greater quantity of land than the Reduced Density, with modified Project Design Alternative, both would require monitoring by qualified archeological and/or paleontological experts. Thus, the Reduced Density, With Project Redesign Alternative would be considered neither environmentally superior nor inferior to the proposed Project.

Geology and Soils

Under this Alternative, less residents and structures would be exposed to seismic hazards than the proposed Project. Both this Alternative and the proposed Project would involve grading for the realignment of State Route 38 and for structures to the north and south (lakefront) of State Route 38. Grading required for this Alternative would occur for development of approximately 66 residential lots to the north and south of State Route 38. The amount of grading associated with this Alternative would create similar potential impacts from slope stability as the proposed Project, since both would develop homes on the steepest portions (northern half) of the site. Compared to the proposed Project, the Reduced Density, With Project Redesign Alternative would be considered neither environmentally superior nor inferior.

Hydrology and Drainage

The Reduced Density, With Project Redesign Alternative would involve less development in the project area than the proposed Project. The amount of impermeable surface area (i.e., residences, driveways, etc) would be less with this Alternative than the proposed Project. Additionally, this Alternative would involve fewer residences and vehicles on-site, thus reducing pollution sources of stormwater runoff. The overdraft condition noted for the proposed Project may still occur and based on 66 units of development would result in consistent groundwater affects. Compared to the proposed Project, the Reduced Density, With Project Redesign Alternative would be neither environmentally superior nor inferior.

ABILITY TO MEET PROJECT OBJECTIVES

The Reduced Density, With Project Redesign Alternative would decrease the intensity of the environmental impacts associated with the proposed construction and development of the proposed Project. This Alternative would decrease potential impacts resulting from alterations of the Project sites' physical characteristics and construction of new structures and uses. Since this Alternative would involve decreased residential densities to the south of State Route 38, views of Big Bear Lake and the distant mountain ranges from State Route 38 would be less obstructed when compared to the proposed Project. The Reduced Density, With Project Redesign Alternative would result in reduced impacts to public services and utilities, aesthetics, traffic and circulation, air quality, noise, biological resources and hydrology and drainage associated with the proposed Project. Groundwater affects would be consistent with conclusions rendered for the proposed Project. This Alternative does not meet the entire objectives established for the proposed Project which is to provide up to 92 single-family residential lots to be developed, as custom lots, in the future.

7.5 "ENVIRONMENTALLY SUPERIOR" ALTERNATIVE

The proposed Project would generate impacts related to public services and utilities, aesthetics, traffic and circulation, air quality, noise, biological resources, cultural resources, geology and soils and hydrology and drainage. All impacts, with the exception of those identified for public services/utilities (ability to be served water), aesthetics, air quality, biological resources and hydrology (groundwater) can be mitigated to less than significant levels. The identified aesthetic, air quality, biological resources and hydrology (groundwater) impacts remain significant and unavoidable, even with the imposition of mitigation measures.

The "No Project/No Development" and the "No Project/Existing Designation" Alternatives would both eliminate and/or reduce all environmental impacts from those anticipated for the proposed Project. However, these alternatives are not being considered for the reason that they do not meet the objectives established for the proposed Project.

The "Reduced Density, With Project Redesign" and the "Reduced Density, Without Road Alignment and Without Marina" Alternatives both would result in fewer impacts to public services and utilities, aesthetics/light and glare, traffic and circulation, air

quality, noise, biological resources, and hydrology and drainage. While the "Reduced Density, With Project Redesign" Alternative most closely meets the objectives of the proposed Project, it would also result in significant and unavoidable aesthetic impacts. However, the "Reduced Density, Without Road Alignment and Without Marina" Alternative would reduce the majority of all impacts to less than significant levels, including aesthetic impacts.

In addition, as cited in Section 15126.6(e)(2) of the CEQA Guidelines: *"If the environmentally superior alternative is the "No Project" Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."* Thus, the "Reduced Density, Without Road Alignment and Without Marina" Alternative is concluded as the environmentally superior alternative.

8.0 Inventory of Mitigation Measures

8.0 INVENTORY OF MITIGATION MEASURES

LAND USE AND RELEVANT PLANNING

SAN BERNARDINO COUNTY GENERAL PLAN

5.1-1 No mitigation measures are recommended.

SAN BERNARDINO COUNTY DEVELOPMENT CODE

5.1-2 No mitigation measures are recommended.

CUMULATIVE

5.1-3 No mitigation measures are recommended.

RECREATION

EXPANSION AND/OR CONSTRUCTION OF RECREATIONAL FACILITIES

5.2-1 No mitigation measures are recommended.

PUBLIC ACCESS

5.2-2 ~~No mitigation measures are recommended.~~ The proposed project shall be conditioned to incorporate a pedal path easement along the south side of North Shore Drive, prior to map recordation.

CUMULATIVE

5.2-3 No mitigation measures are recommended.

PUBLIC SERVICES AND UTILITIES

FIRE PROTECTION

5.3-1a The fire flow requirement shall be 1750 gpm @ 2 hours based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm @ 2 hours for homes greater than 4,800 square feet.

5.3-1b ~~Fire sprinklers for each residence shall be provided in lieu of additional manpower.~~ All residences less than 5,000 square feet shall be subject to the standard fire sprinkler requirement (NFPA 13D). Homes above 5,000 square feet shall be subject to the NFPA13R~~have a larger~~ sprinkler requirement ~~(FPA13R)~~.

5.3-1c A ~~f~~Fuels ~~modification program~~Management Plan, with specifications, shall be prepared and subject to approval by the County of San Bernardino

Fire Department and San Bernardino National Forest Service. The Fuels Management Plan shall implement the fire safety requirements of the FS1 Fire Safety Overlay District, including a 30-foot minimum setback requirement from the National Forest. The fuel modification zone shall be located entirely within the project's boundaries. ~~The 100 foot fuel modification requirement shall not terminate at a property line. The 100 foot fuel modification requirement shall extend beyond property lines. Where such fuel modification zone extends onto U.S. Forest Service land, an easement or permit shall be required to be obtained.~~ The minimum~~100 foot~~ fuel modification zone requirements may be greater in steeper areas (up to 300 ft.), as determined by the Fire ~~Agency~~ Department.

5.3-1d Cul-de-sac lengths shall be no longer than 350 feet.

5.3-1e A Homeowner's Association or a Special District shall be established to ~~assure~~ implement the Fuels Management Plan. The Fuels Management Plan shall specify any professional assistance, if necessary, to implement the action portion of the plan. The Plan shall determine if a Registered Professional Forrester is necessary for professional guidance to implement the Plan. ~~Long-term vegetation maintenance. An annual vegetation maintenance program shall be included.~~ The HOA or Special District is to be responsible for fuel modification in common areas.

~~5.3-1f Fire resistance/drought tolerant landscaping shall be required and referenced in the Homeowner's Association or Special District Standards.~~

POLICE PROTECTION

5.3-2 No mitigation measures are recommended.

SCHOOLS

5.3-3 No mitigation measures are recommended.

LIBRARIES

5.3-4 No mitigation measures are recommended.

WASTEWATER

5.3-5a Prior to issuance of building permits, the Project Applicant shall fund all on-site and off-site sewer improvements required to support development of the Project site. Such improvements shall be to the satisfaction of the BBARWA, and may include replacement of existing sewer lines rather than construction of parallel lines.

5.3-5b Prior to issuance of building permits, the Project Applicant shall provide evidence to the County of San Bernardino that the BBARWA has

sufficient transmission and treatment plant capacity to accept sewage flows from the Project site.

5.3-5c The Project Applicant shall relocate the BBARWA 10" force main by installing new pipe (and/or bonding for the relocation) so that it is aligned within the south shoulder of the relocated State Route 38. The 10" force main shall be accessible for BBARWA to maintain and repair the sewer force main. The force main shall not pass through residential lots within the proposed tract.

5.3-5d The Project Applicant shall install air release valves and vaults at high elevation points on the new force main to minimize odors. Air release valves shall be large enough to enclose 55-gallon drum carbon filters to control odors.

WATER

5.3-6a ~~Prior to approval of building permits, a video inspection of water supply casings and screen shall be conducted in order to update~~ Values of production rates and pumping levels for on-site water supply wells shall be obtained through step-drawdown and constant rate pumping tests. Water samples shall be taken during the inspection for testing and analysis in accordance with standard requirements.

5.3-6b If either or both of the two existing on-site wells are utilized as a water source for the project, ~~T~~the Project Applicant shall equip the~~two existing on-site~~ wells to meet DWP and/or County Special Districts Department standards and dedicate these facilities and water rights to the appropriate water purveyor~~County of San Bernardino~~. Within the proposed tract, no individual private irrigation wells shall be permitted.

5.3-6c ~~If served by CSA 53-C through a contract with the City of Big Bear Lake Department of Water and Power, t~~ After a determination has been made regarding the water purveyor, the Project Applicant shall advance fair-share funds ~~or enter into a reimbursement agreement with the~~ to the appropriate water agency (CSA and/or DWP) ~~(if required)~~ towards constructing a new reservoir and pipeline improvement at Cline-Miller Reservoir (with an estimated project cost at $481,100). These facilities would be dedicated to the appropriate water agency.

5.3-6d The following water conservation measures are the minimum measures that shall be complied with in conjunction with domestic water supply to the project. A Homeowners Association shall be responsible for enforcing the water conservation measures. Additional measures may be imposed as a result of a contract for water supply between CSA 53-C and the City of Big Bear Lake DWP:

- Landscape shall not be irrigated between the hours of nine (9) a.m. and six (6) p.m.

- Residences, buildings and premises shall be limited to watering every other day.

- Landscape irrigation shall be limited to what is needed and shall not be excessive. Water from landscape irrigation shall not be allowed to run off into streets.

- Water shall not be allowed to leak from any waterline, faucet, or any other facility, either within or outside a private residence, business establishment or on private property. All such leaking waterlines, faucets, and other facilities shall be repaired immediately to prevent leakage.

- Sidewalks, paved driveways, and parkways shall not be washed off with hoses, except as required for sanitary purposes.

- Non-commercial washing of cars, and boats or any other vehicle shall only be done with an automatic shut-off nozzle on a hose, or with a bucket.

- New landscaping shall not exceed more than one-thousand square feet of turf on a parcel or lot or twenty-five percent of the available landscape area.

- A model landscaping and irrigation guide shall be prepared for the tract and required by homeowner association rules. The guide shall specify a plant palate that emphasizes native plants and cultivars that are suitable for the mountain climate. Plant materials shall be low water consuming and fire resistant. Irrigation shall emphasize drip and bubbler type emitters with limit aerial spray irrigation methods. The guide shall be reviewed and approved by the Land Use Services Department.

SOLID WASTE

5.3-7 No mitigation measures are recommended.

NATURAL GAS

5.3-8 No mitigation measures are recommended.

ELECTRICITY

5.3-9 No mitigation measures are recommended.

CUMULATIVE

5.3-10 No mitigation measures are recommended.

AESTHETICS/LIGHT AND GLARE

SHORT-TERM AESTHETIC/LIGHT AND GLARE IMPACTS

5.4-1a Construction equipment staging areas shall be located away from existing residential uses. Appropriate screening (i.e., temporary fencing with opaque material) shall be used to buffer views of construction equipment and material, when feasible. Staging locations shall be indicated on project Grading Plans.

5.4-1b All construction-related lighting associated with the construction of new roadways, the realignment of State Route 38, and the installation of utilities shall be located and aimed away from adjacent residential areas. Lighting shall use the minimum wattage necessary to provide safety at the construction site. A construction safety lighting plan shall be submitted to the county for review concomitant with Grading Permit applications for the subdivision of the lots.

LONG-TERM AESTHETIC IMPACTS

5.4-2a Roof pitches shall not exceed 9/12 and no higher than two-story for any portion of the structure footprint for lots 62-92.

5.4-2b All homes shall provide a two-car garage with automatic garage doors.

5.4-2c A view envelope for each property shall be established by creating a line starting at 6 feet at each side lot line and moving up at a 30 degree angle until both lines meet at the middle of the property. The area located under these lines is the view envelope. Structures shall not protrude outside the view envelope. The view envelope orients the building ridgeline parallel to the view corridors on narrower lots providing views for residents located behind the property.

5.4-2d New development shall be subordinate to the natural setting and minimize reflective surfaces. Building materials including siding and roof materials shall be selected to blend in hue and brightness with the surroundings. Colors shall be earth tones, shades of grays, tans, browns, greens, pale yellows, and shall be consistent with the mountain character of the area.

5.4-2e Outside parking/storage areas associated with the boat dock activities shall be completely screened from view by the placement of landscaping and plantings which are compatible with the local environment and, where practicable, are capable of surviving with a minimum of maintenance and supplemental water.

5.4-2f Construction plans for each individual lot shall include the identification and placement of vegetation with the mature height of trees listed. Landscaping and plantings should not obstruct significant views, within or outside of the project, either when installed or when they reach mature

growth. The removal of existing vegetation shall not be required to create views.

5.4-2g A Note shall be placed on the Composite Development Plan stating that during construction plans review and prior to issuance of building permits for each lot, the building inspector shall refer to the Mitigation Monitoring and Compliance Program regarding these aesthetic impact mitigation measures. The building inspector shall coordinate with the Advance Planning Division the review and approval of building plans in relation to these aesthetic impact mitigation measures, prior to approval and issuance of building permits.

LONG-TERM SCENIC HIGHWAY IMPACTS

5.4-3a Any entry sign for the development shall be a monument style sign compatible with the mountain character, preferably, rock or rock-appearance.

5.4-3b Prior to recordation of the tract map (and/or any ground disturbance, whichever occurs first), landscaping plans for lettered lots B and C shall be submitted to and approved by the San Bernardino County Planning Department.

LONG-TERM LIGHT AND GLARE IMPACTS

5.4-4a All exterior lighting shall be designed and located as to avoid intrusive effects on adjacent residential properties and undeveloped areas adjacent to the project site. Low-intensity street lighting and low-intensity exterior lighting shall be used throughout the development to the extent feasible. Lighting fixtures shall use shielding, if necessary to prevent spill lighting on adjacent off-site uses.

5.4-4b Lighting used for various components of the development plan shall be reviewed for light intensity levels, fixture height, fixture location and design by an independent engineer, and reviewed and approved by the County Building and Safety Division.

5.4-4c The project shall use minimally reflective glass. All other materials used on exterior buildings and structures shall be selected with attention to minimizing reflective glare.

5.4-4d Vegetated buffers shall be used along State Route 38 to reduce light intrusion on residential development and on forested areas located adjacent to the project site.

5.4-4e Mitigation Measures 5.4-4a through 5.4-4d shall be included within the Conditions, Covenants and Restrictions (CC&Rs) of the Home Owner's Association (HOA).

5.4-4f All outdoor light fixtures shall be cutoff luminaries and shall only use high- or low-pressure sodium lamps.

5.4-4g The Project Applicant/Developer shall install light colored, reflective roof products. Such roofs shall utilize light colored, reflective materials that meet the performance standards developed by the Energy Star Labeled Roof Program, as well as the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standards 90.1 and 90.2 on energy efficient buildings. This condition shall be verified by the County of San Bernardino Building and Safety Division prior to issuance of building permits.

CUMULATIVE

5.4-5 No mitigation measures are recommended.

TRAFFIC AND CIRCULATION

EXISTING CONDITIONS WITH PROJECT TRAFFIC ANALYSIS

5.5-1 For existing traffic conditions, the intersection of Stanfield Cutoff and Big Bear Boulevard currently requires the eastbound right turn lane to be converted to an eastbound through lane, through the intersection. The eastbound right turn lane is restricted to an eastbound through lane, and involves roadway widening. The project's pro rata share of these off-site road improvements is estimated to be $17,748.

YEAR 2006 TRAFFIC ANALYSIS

5.5-2 Refer to Mitigation Measure 5.5-1. No additional mitigation measures are recommended.

YEAR 2025 TRAFFIC ANALYSIS

5.5-3 For future traffic conditions, the intersection of Stanfield Cutoff and North Shore Drive shall require a traffic signal. The project's pro rata share of the signal is $56,523.

SAFETY HAZARDS AND EMERGENCY ACCESS

5.5-4a Parking shall be restricted on State Route 38.

5.5-4b A 150-foot eastbound left turn pocket shall be striped for traffic on North Shore Drive turning left into the project entry locations.

5.5-4c For future traffic conditions, intersection geometrics as recommended in Table 1b of the Kunzman Associates June 2003 *Traffic Analysis* report, shall be implemented.

5.5-4d All streets internal to the project shall be constructed to full ultimate cross-sections. ~~as adjacent development occurs.~~

5.5-4e A STOP sign shall be installed to control outbound traffic on all site access roadways onto North Shore Drive.

5.5-4f The County of San Bernardino shall periodically review traffic operations in the vicinity of the site once the project is constructed in order to assure that the traffic operations are satisfactory.

5.5-4g Landscape plantings and signs shall be limited to 36 inches in height within 25 feet of project driveways to assure good visibility.

AIR QUALITY

SHORT-TERM AIR QUALITY IMPACTS

5.6-1 In accordance with the County Development Code and SCAQMD Rules, the Project Applicant shall incorporate the following measures during the construction phase of the Project to the satisfaction of the SCAQMD and County of San Bernardino. Compliance with this measure is subject to periodic field inspections by the SCAQMD and County of San Bernardino.

Grading:

Apply non-toxic soil stabilizers according to manufacturer's specifications to all inactive construction areas (previously graded for ten days or more);

- Replace ground cover in disturbed areas as quickly as possible;
- Enclose, cover, water two times daily or apply non-toxic soil binders in accordance to manufacturer's specifications to exposed piles (i.e., gravel, sand, dirt) with 5% or greater silt content;
- Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph; and
- All trucks hauling dirt, sand, soil, or other loose materials shall be covered and shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer).

Paved Roads:

- Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads.

LONG-TERM OPERATIONAL IMPACTS

5.6-2 To the extent feasible, the project shall incorporate the installation of EPA-certified wood burning stoves or fireplaces. If this is not feasible, then the installation of a ceramic coating on the honeycomb inside a catalytic combustor shall be investigated as a feasible alternative. Alternatively, the use of natural gas fireplaces may be used as a feasible alternative.

CONSISTENCY WITH AIR QUALITY MANAGEMENT PLAN

5.6-3 No mitigation measures are recommended.

CUMULATIVE

5.6-4 No mitigation measures are recommended.

NOISE

SHORT-TERM CONSTRUCTION NOISE AND VIBRATION IMPACTS

5.7-1a Construction activities shall be limited to the hours of 7:00 a.m. ~~and~~ to 7:00 p.m. Monday to Saturday and prohibited on Sundays and Federal Holidays.

5.7-1b All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the County Engineer.

5.7-1c Stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receptors, to the satisfaction of the County Engineer.

5.7-1d Stockpiling and staging areas shall be located as far as practical from noise sensitive receptors during construction activities, to the satisfaction of the County Engineer.

LONG-TERM NOISE IMPACTS

5.7-2 No mitigation measures are recommended.

STATIONARY NOISE

5.7-3 No mitigation measures are recommended.

WATERCRAFT

5.7-4 No mitigation measures are recommended.

CUMULATIVE

5.7-5 No mitigation measures are recommended.

BIOLOGICAL RESOURCES

SPECIAL STATUS BIOLOGICAL RESOURCES

SPECIAL STATUS PLANTS

5.8-1a ~~Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on listed special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented.~~

~~The project applicant shall pay compensation for the loss of special status botanical resources identified on the project site by the survey by funding the purchase and management of off-site habitat through contributions to a fund established by the California Wildlife Foundation on behalf of the CDFG. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development).~~

~~If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the project applicant is responsible for the mitigation of a minimum of 11.8-acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the federally-listed Threatened ash-gray Indian paintbrush (i.e., would be required to fund the purchase of 35.4-acres of offsite habitat from the California Wildlife Foundation if the agreed mitigation ratio is 3:1).~~

Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented. Pebble plain habitat acreages will be recalculated following

the survey using criteria established by the Habitat Management Guide for Pebble Plain Habitat on the National Forest System (2002).

Should avoidance/retention on-site of the 4.91 acres of Pebble Plain habitat in permanent open space under a Conservation Easement Agreement not occur, the Project Applicant shall pay compensation for the loss of special status botanical resources identified on the project site during the survey by funding the purchase, establishment of a conservation easement, and management of off-site habitat within the conservation easement by an entity approved by the CDFG. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio of 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development). Prior to the initiation of clearing or grading activities on the project site, the conservation easement will be established, the management entity will be approved by the CDFG, and a non-wasting endowment will be established for the monitoring and management of the preservation site by the management entity in perpetuity.

If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the Project Applicant is responsible for mitigating impacts to a minimum of 11.8-acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the Federally-listed Threatened ash-gray Indian paintbrush. As such, the applicant would be required to fund the purchase and maintenance of 35.4-acres of offsite pebble plain and open Jeffrey pine forest habitat that contains special status plant species, including Ash-gray Indian paintbrush and others known to occur on the site.

SPECIAL STATUS WILDLIFE

5.8-1b Trees identified on Exhibits 3 and 4 of the Bald Eagle Survey Report (Appendix E, see attached) as eagle perch locations shall be preserved in place upon project completion and shall not be removed under any circumstances. Any development that may occur within the project site and in the individual lots must avoid impacts to these trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.

5.8-1c Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed to identify all large trees (i.e., greater than 20-inches in diameter at 4.5 feet from the ground) within 600 feet from the high water line. Trees identified on the project site as having a diameter in excess of 20-inches at four feet from the ground within 600 feet of the shoreline

shall be documented and tagged. Any development that may occur within the project site and in the individual lots must avoid impacts to tagged trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.

5.8-1d Seven days prior to the onset of construction activities, a qualified biologist shall survey within the limits of project disturbance for the presence of any active raptor nests. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG.

If nesting activity is present at any raptor nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for raptors in the region of the project site normally occurs from February 1 to June 30. To protect any nest site, the following restrictions on construction are required between February 1 and June 30 (or until nests are no longer active as determined by a qualified biologist): (1) clearing limits shall be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying shall not be allowed within 200 feet of any occupied nest. Any encroachment into the 300/200 foot buffer area around the known nest shall only be allowed if it is determined by a qualified biologist that the proposed activity shall not disturb the nest occupants. Construction during the nesting season can occur only at the sites if a qualified biologist has determined that fledglings have left the nest.

5.8-1e Vegetation removal, clearing, and grading on the project site shall be performed outside of the breeding and nesting season (between March and September) to minimize the effects of these activities on breeding activities of migratory birds and other species.

5.8-1f The use of the boat dock for motorized boating shall be prohibited between the dates of December 1 and April 1. No motorized boats shall be allowed to launch or moor in the vicinity of the boat dock at any time during this period. This restriction shall be clearly displayed on signage at the entrance to the parking lot and on the boat dock visible from both land and water. This requirement shall also be published in the Homeowner's Association CC&Rs.

~~**SPECIAL STATUS VEGETATION TYPES**~~

~~5.8-1g Exterior construction shall be prohibited between the dates of December 1 and April 1 (of each year). Significant impacts to pebble plain habitat can be mitigated to a less than significant level through off-site preservation. The project applicant shall pay compensation for the loss of special status botanical resources identified on the site, by the survey, by contributing to the funding of purchase and management of off-site habitat. The Applicant shall acquire habitat in the Big Bear Valley and dedicate to the CDFG or suitable conservation organization. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development. An area containing no less than 2.1 acres of pebble plain habitat in an area located adjacent to other open space areas within the project vicinity shall be preserved in perpetuity. The preserved areas shall be protected from future development through a conservation easement or other appropriate mechanism.~~

SENSITIVE NATURAL COMMUNITIES/HABITATS

WILDLIFE IMPACTS/INDIRECT IMPACTS

5.8-2a Street lamps on the project site shall not exceed 20 feet in height, shall be fully shielded to focus light onto the street surface and shall avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights shall utilize low color temperature lighting (e.g., red or orange).

5.8-2b Outdoor lighting for proposed homes on the individual tentative tracts shall not exceed 1,000 lumens. Furthermore, residential outdoor lighting shall not exceed 20 feet in height and must be shielded and focused downward to avoid lighting spillover onto adjacent open space or properties. These restrictions on outdoor lighting of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This requirement shall also be published in the Homeowner's Association CC&Rs.

5.8-2c To limit the amount of human disturbance ~~to~~ on adjacent natural open space areas, signs shall be posted along the northeastern and eastern perimeter of the project site where the property boundary abuts open space~~ directing people to keep out of the adjacent natural open space areas and to keep dogs leashed in areas adjacent to natural open space areas. This requirement shall be published in the Homeowner~~

~~Association CC&Rs~~ with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash at all times."

In addition, a requirement stating that residents shall keep out of adjacent open space areas to the north with the exception of designated trails will be published in the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents.

5.8-2d Prior to ~~the issuance of individual building permits, landscaping designs~~ recordation of the final map, a landscaping plan for the entire tract shall be prepared (inclusive of a plant palette) with native trees and plant species, and, shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review shall determine that no non-native or invasive plant species are to be used in the proposed landscaping. The biologist should suggest appropriate native plant substitutes. A note shall be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform with the overall approved tract map landscaping plan. A requirement shall be included stating that residents shall include a restriction of the use of tree and plant species to only native trees/plants approved per the overall tract map landscaping plan, the Homeowner Association CC&Rs shall also restrict (individual lot owners) to use only native tree and plant species approved per the overall tract map landscaping plan.

5.8-2e ~~Garages with automatic door openers shall be required. No exterior construction shall occur between December 1 and April 1, when bald eagles are present~~. Garages with automatic door openers shall be required. No exterior construction, grading or vegetation clearing shall be permitted between December 1 and April 1, which is the wintering period for bald eagles (i.e., the season when bald eagles are present in the Big Bear area).

Also refer to mitigation measures 5.8-1a to 5.8-1f.

JURISDICTIONAL WATERS

5.8-3 ~~No mitigation measures are recommended.~~ Per the direction of the California Department of Fish and Game, all unavoidable impacts to State and Federal jurisdictional lakes, streams, and associated habitat shall be compensated for with the creation and/or restoration of in-kind habitat on-site and/or off-site at a minimum 3:1 replacement-to-impact ratio. Additional requirements may be required through the permitting process depending on the quality of habitat impacted, project design and other factors.

WILDLIFE MOVEMENT

5.8-4 No mitigation measures are recommended.

REGIONAL AND LOCAL POLICIES/PLANS

5.8-5 No mitigation measures are recommended.

CUMULATIVE

5.8-6 No mitigation measures are recommended.

CULTURAL RESOURCES

ARCHAEOLOGICAL/HISTORICAL RESOURCES

5.9-1 Project-related grading, grubbing, trenching, excavations, and/or other earth-moving activities in the project area shall be monitored by a qualified archaeologist. In the event that a material of potential cultural significance is uncovered during such activities on the project site, all earth-moving activities in the project area shall cease and the archeologist shall evaluate the quality and significance of the material. Earth-moving activities shall not continue in the area where a material of potential cultural significance is uncovered until resources have been completely removed by the archaeologist and recorded as appropriate.

PALEONTOLOGICAL RESOURCES

5.9-2a Grading shall be monitored during excavation in areas identified as likely to contain paleontologic resources by a qualified paleontological monitor. Monitoring shall be accomplished for any undisturbed subsurface older alluvium, which might be present in the subsurface. The monitor shall be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments which are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert grading equipment to allow for removal of abundant or large specimens.

5.9-2b Recovered specimens shall be prepared to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.

5.9-2c Identification and curation of specimens into a museum repository with permanent retrievable storage shall occur for paleontological resources.

5.9-2d A report of findings shall be prepared with an appended itemized inventory of specimens. The report shall include pertinent discussion of the significance of all recovered resources where appropriate. The report and inventory when submitted to the appropriate Lead Agency, shall signify completion of the program to mitigate impacts to paleontologic resources.

BURIAL SITES

5.9-3 In the event human remains are discovered during grading/ construction activities, work shall cease in the immediate area of the discovery and the Project Applicant shall comply with the requirements and procedures set forth in Section 5097.98 of the Public Resources Code, including notification of the County Coroner, notification of the Native American Heritage Commission, and consultation with the individual identified by the Native American Heritage Commission to be the "most likely descendent."

CUMULATIVE

5.9-4 No mitigation measures are recommended.

GEOLOGY AND SOILS

SLOPE STABILITY

5.10-1 The stability of ~~S~~south facing cut slopes shall be analyzed as part of the design-level geotechnical investigation. ~~u~~Utiliz~~e~~ing 2:1 buttressed slopes using on site native soil materials, or ~~by~~ constructing geotextile-reinforced soil buttresses ~~where~~for planned unstable cut slopes ~~are planned~~ are typical engineering designs for stabilizing slopes. Either of these methods, or other methods must be approved by the San Bernardino County Department of Building and Safety~~Geologist for slope reinforcement may be utilized~~.

SOIL EROSION

5.10-2a Due to the potential for erosion associated with younger alluvial deposits within the two major on-site stream channels, increased surface drainage quantities associated with development on-site shall be directed away from the stream channels.

5.10-2b Prior to the issuance of Grading Permits, the Project Applicant shall prepare a Soil Erosion and Sedimentation Plan for submittal and approval by the County Building and Safety Department.

GROUND SHAKING

5.10-3 Engineering design for all structures and roadways shall be based on the 2001 California Uniform Building Code. Construction plans shall be in accordance with seismic design standards set forth by the County's Development Code and Uniform Building Code.

SEICHE

5.10-4 Residential structures shall be located in areas which provide a minimum of five feet of freeboard above the high water line for any structures.

EXPANSIVE SOILS

5.10-5 Prior to grading permit issuance, ~~geologic analysis/studies shall be required including 1)~~ a quantitative geotechnical analysis and~~of liquefaction, 2) a~~ design-level geotechnical engineering report shall be required and submitted to the County of San Bernardino Department of Building and Safety for their approval. ~~and 3) a design level engineering geology report.~~

CUMULATIVE

5.10-6 No mitigation measures are recommended.

HYDROLOGY AND DRAINAGE

DRAINAGE AND RUNOFF

5.11-1 The proposed cross culverts shall be sized for 100-year burn and bulking flow rates. The burn and bulking method would increase the runoff from the natural areas. The method provided in the Los Angeles County Hydrology Manual is recommended. In addition, the cross culverts shall all be designed with headwalls to prevent CMP crushing, and shall be maintained adequately.

GROUNDWATER

~~5.11-2 Based upon the technical analysis presented, a potential groundwater overdraft condition would occur and no additional mitigation measures have been identified.~~

5.11-2a Within three months of project approval, the Project Applicant shall submit a plan for a detailed geohydrologic investigation. The plan must present the possible sources of groundwater selected for the project and the methodology proposed to investigate those sources. If the on-site wells are to be utilized to serve this project, it must be determined if either could draw water from Big Bear Lake. The plan must be prepared by a California Registered Geologist.

5.11-2b Within six months of plan approval, the Project Applicant shall submit the results of the geohydrologic investigation. The report must be prepared by a California Registered Geologist.

5.11-2c Concurrently or within three months of approval by the geohydrologic report, the Project Applicant shall submit a groundwater monitoring plan

in accordance with San Bernardino County's "Guidelines for Preparation of a Groundwater Monitoring Plan." The plan must be prepared by a California Registered Geologist.

WATER QUALITY - CONSTRUCTION

5.11-3 Prior to Grading Permit issuance and as part of the Project's compliance with the NPDES requirements, a Notice of Intent (NOI) shall be prepared and submitted to the Santa Ana Regional Water Quality Control Board providing notification and intent to comply with the State of California general permit. Also, a Storm Water Pollution Prevention Plan (SWPPP) shall be completed for the construction activities on-site. A copy of the SWPPP shall be available and implemented at the construction-site at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction-site to the "maximum extent practicable." At a minimum, the following shall be implemented from the *California Storm Water Best Management Practice Handbook - Construction Activity:*

- *CA 1 Dewatering Operations* – This operation requires the use of sediment controls to prevent or reduce the discharge of pollutants to storm water from dewatering operations.
- *CA 2 Paving Operations* – Prevent or reduce the runoff of pollutants from paving operations by proper storage of materials, protecting storm drain facilities during construction, and training employees.
- *CA 3 Structural Construction and Painting* – Keep site and area clean and orderly, use erosion control, use proper storage facilities, use safe products and train employees to prevent and reduce pollutant discharge to storm water facilities from construction and painting.
- *CA 10 Material Delivery and Storage* – Minimize the storage of hazardous materials on-site. If stored on-site, keep in designated areas, install secondary containment, conduct regular inspections and train employees.
- *CA 11 Material Use* – Prevent and reduce the discharge of pesticides, herbicides, fertilizers, detergents, plaster, petroleum products and other hazardous materials from entering the storm water.
- *CA 20 Solid Waste Management* – This BMP describes the requirements to properly design and maintain trash storage areas. The primary design feature requires the storage of trash in covered areas.
- *CA 21 Hazardous Waste Management* – This BMP describes the requirements to properly design and maintain waste areas.

- *CA 23 Concrete Waste Management* – Prevent and reduce pollutant discharge to storm water from concrete waste by performing on and off-site washouts in designated areas and training employees and consultants.

- *CA 24 Sanitary Septic Water Management* – Provide convenient, well-maintained facilities, and arrange regular service and disposal of sanitary waste.

- *CA 30 Vehicle and Equipment Cleaning* – Use off-site facilities or wash in designated areas to reduce pollutant discharge into the storm drain facilities.

- *CA 31 Vehicle and Equipment Fueling* – Use off-site facilities or designated areas with enclosures or coverings to reduce pollutant discharge into the storm drain facilities.

- *CA 32 Vehicle and Equipment Maintenance* – Use off-site facilities or designated areas with enclosing or coverings to reduce pollutant discharge into the storm drain facilities. In addition, run a "dry site" to prevent pollution discharge into storm drains.

- *CA 40 Employee and Subcontractor Training* – Have a training session for employees and subcontractors to understand the need for implementation and usage of BMPs.

- *ESC 2 Preservation of Existing Vegetation* – Minimize the removal of existing trees and shrubs since they serve as erosion control.

- *ESC 10 Seeding and Planting* – Provide soil stability by planting and seeding grasses, trees, shrubs, vines, and ground cover.

- *ESC 11 Mulching* – Stabilize cleared or freshly seeded areas with mulch.

- *ESC 20 Geotextiles and Mats* – Natural or synthetics material can be used for soil stability.

- *ESC Dust Control* – Reduce wind erosion and dust generated by construction activities by using dust control measures.

- *ESC 23 Construction Road Stabilization* – All on-site vehicle transport routes shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust.

- *ESC 24* – Stabilized Construction Entrance – Stabilize the entrance pad to the construction area to reduce amount of sediment tracked off-site.

- *ESC 30 Earth Dikes* – Construct earth dikes of compacted soil to divert runoff or channel water to a desired location.

- *ESC 31 Temporary Drains and Swales* – Use temporary drains and swales to divert off-site runoff around the construction-site and stabilized areas and to direct it into sediment basins or traps.

- *ESC 40 Outlet Protection* – Use rock or grouted rock at outlet pipes to prevent scouring of soil caused by high velocities.

- *ESC 41 Check Dams* – Use check dams to reduce velocities of concentrated flows, thereby reducing erosion and promoting sedimentation behind the dams. Check dams are small and placed across swales and drainage ditches.

- *ESC 50 Silt Fence* – Composed of filter fabric, these are entrenched, attached to support poles, and sometimes backed by wire fence support. Silt fences promote sedimentation behind the fence of sediment-laden water.

- *ESC 51 Straw Bale Barrier* – Place straw bales end to end in a level contour in a shallow trench and stake them in place. The bales detain runoff and promote sedimentation.

- *ESC 52 Sand Bag Barriers* – By stacking sand bags on a level contour, a barrier is created to detain sediment-laden water. The barrier promotes sedimentation.

- *ESC 53 Brush or Rock Filter* – Made of 0.75 to 3-inch diameter rocks placed on a level contour or composed of brush wrapped in filter cloth and staked to the toe of the slope provides a sediment trap.

- *ESC 54 Storm Drain Inlet Protection* – Devices that remove sediment from sediment laden storm water before entering the storm drain inlet or catch basin.

- *ESC 55 Sediment Trap* – A sediment trap is a small, excavated, or bermed area where runoff for small drainage areas can pass through allowing sediment to settle out.

WATER QUALITY – LONG-TERM

5.11-4a Prior to Grading Permit issuance, a Water Quality Management Plan shall be developed and shall include both Non-Structural and Source Control BMPs. The WQMP shall conform to the San Bernardino County Draft NPDES permit and WQMP standards. The following are the minimum required controls to be implemented as a part of the *Water Quality Management Plan (WQMP) for Urban Runoff.*

- *Education for Property Owners, Tenants and Occupations* – The Property Owners Association is required to provide awareness educational material, including information provided by San Bernardino County. The materials shall include a description of chemicals that should be limited to the property and proper disposal, including prohibition of hosing waste directly to gutters, catch basins, storm drains or the lake.

- *Activity Restrictions* – The developer shall prepare conditions, covenants and restriction of the protection of surface water quality.

- *Common Area Landscape Management* – For the common landscape areas on-going maintenance shall occur consistent with County Administrative Design Guidelines or city equivalent, plus fertilizer and pesticide usage consistent with the instructions contained on product labels and with regulation administered by the State Department of Pesticide Regulation or county equivalent.

- *Common Area Catch Basin Inspection* – Property Owners Associations shall have privately owned catch basins cleaned and maintained, as needed. These are intended to prevent sediment, garden waste, trash and other pollutants from entering the public streets and storm drain systems.

- *Common Area Litter Control* – POAs shall be required to implement trash management and litter control procedures to minimize pollution to drainage waters.

- *Street Sweeping Private Streets and Parking Lots* – Streets and Parking lots shall be swept as needed, to prevent sediment, garden waste, trash and other pollutants from entering public streets and storm drain systems.

The following controls from the *California Storm Water Best Management Practice Handbook - Municipal* shall be employed:

- *SC10 Housekeeping Practices* – This entails practices such as cleaning up spills, proper disposal of certain substances and wise application of chemicals.

- *SC32 Used Oil Recycling* – May apply to maintenance and security vehicles.

- *SC72 Vegetation Controls* – Vegetation control typically includes chemical (herbicide) application and mechanical methods. Chemical methods are discussed in SC10. Mechanical methods include leaving existing vegetation, cutting less frequently, hand cutting, planting low maintenance vegetation, collecting and properly disposing of clippings and cuttings, and educating employees and the public.

- *SC73 Storm Drain Flushing* – Although general storm drain gradients are sufficiently steep for self-cleansing, visual inspection may reveal a buildup of sediment and other pollutants at the inlets or outlets, in which case flushing may be advisable.

5.11-4b The Water Quality Management Plan (WQMP) shall include Structural or Treatment BMPs. The structural BMPs utilized shall focus on meeting potential TMDL requirements for noxious aquatic plants, nutrients, sedimentation and siltation. The structural BMPs shall conform to the San Bernardino County NPDES permit and the San Bernardino WQMP standards.

Consistent with the WQMP guidelines contained in the *Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements* for San Bernardino County, Structural BMPs shall be required for the proposed Project. They shall be sized to comply with one of the following numeric sizing criteria or be considered by the permittees to provide equivalent or better treatment.

Volume Based BMPs shall be designed to infiltrate or treat either:

- The volume of runoff produced from the 85th percentile 24-hour storm event, as determined from the local historical rainfall record; or

- The volume of the annual runoff produced by the 85th percentile 24-hours rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or

- The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practice Handbook – Industrial/Commercial (1993); or

- The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event.

OR

Flow –based BMPs shall be designed to infiltrate or treat either:

- The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or

- The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or

- The maximum flow rate of runoff, as determined from the local historical rainfall record that achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

The following are the minimum required controls to be implemented as a part of the *Water Quality Management Plan (WQMP) for Urban Runoff.*

- *Control of Impervious Runoff* – Surface runoff shall be directed to landscaped areas or pervious areas.

- *Common Area Efficient Irrigation* – Physical implementation of the landscape plan consistent with County Administrative Design Guidelines or city equivalent, which may include provision of water sensors, programmable irrigation timers, etc.

- *Common Area Runoff-Minimizing Landscape Design* – Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration.

- *Catch Basin Stenciling* – "No Dumping – Flows to Lake" or equivalent effective phrase shall be stenciled on catch basins to alert the public as to the destination of pollutant discharging into storm drain.

- *Debris Posts* – These shall be installed to prevent large floatable debris from entering the storm drains. They shall be placed upstream of the cross culverts.

- *Inlet Trash Racks* – These shall be installed where appropriate to reduce intake and transport through the storm drain system of large floatable debris. Trash racks shall be provided where drainage from open areas enters storm drain or cross culverts.

5.11-4c Storm water treatment under the NPDES Permit and the future TMDL requirements shall include the construction of treatment BMPs. Treatment BMPs appropriate for on-site use shall include infiltration trenches and basins, swales, inlet filtration, and/or water quality basins. All storm water runoff shall be treated before leaving the site to reduce pollutants in Big Bear Lake.

Infiltration Trenches and Basins

Infiltration Trenches and/or Basins shall be used on site to meet potential future TMDLs for noxious aquatic plants and nutrients. Infiltration trenches and basins treat storm water runoff through filtration. A typical infiltration trench is essentially an excavated trench, that is lined with filter fabric and backfilled with stones. Depth of the infiltration trench shall range from three to eight feet and shall be located in areas with permeable soils, and water table and bedrock depth situated well below the bottom of the trench. Trenches shall not be used to trap coarse sediments since large sediment would likely clog the trench. Grass

buffers may be installed to capture sediment before it enters the trench to minimize clogging. Infiltration basins shall be used for drainage areas between five and 50 acres. Infiltration basins shall be either in-line or off-line, and may treat different volumes such as the water quality volume or the 2-year or 10-year storm.

Swales

The project shall implement either vegetative swales, enhanced vegetated swales utilizing check dams and wide depressions, a series of small detention facilities designed similarly to a dry detention basin, or a combination of these treatment methods into a treatment train (series of Structural BMPs). The Water Quality Management Plan shall address treatment for the Project to assure that runoff from the site is treated to the "maximum extent practicable".

The swales shall be treated as water quality features and shall be maintained differently than grass areas. Specifically, pesticides, herbicide, and fertilizers, which may be used on the grass areas, shall not be used in the vegetation swales.

Filtration

Filtration shall be implemented as a treatment method and shall use drop-in infiltration devices or inline devices.

Drop-infiltration devices at all curb inlets within the internal parking lots shall be implemented to provide potential pollutant removal. Existing examples of these filtration devices include the Drain Pac Storm Drain Inserts and Fossil Filters. These types of devices are efficient at removing oil and grease, debris, and suspended solids from treated waters. Some of these devices have also exhibited high efficiencies at removing heavy metals and other pollutants.

Inline devices suggested for use onsite include the Continuous Deflection Separator (CDS® unit). Once the runoff has entered the storm drain, an in-line diversion would direct the treatment flow to a CDS® unit. The CDS® unit is a non-blocking, non-mechanical screening system, which would provide a second line of defense for solids removal. Adsorption materials can be added within the CDS® unit to aid in the removal of oil and grease. The treated flow will exit the CDS® unit and continue downstream.

To assure the efficiency of these filtration devices, monitoring shall be conducted. The use of street sweeps on the parking lots and streets shall aid in reducing the amounts of sediment and debris that flow through the devices. This will extend the effectiveness of the devices during a storm and will lower the frequency of required maintenance. The devices shall be checked and cleaned, if necessary, once a month during the

rainy season, following any precipitation and at the end of the dry season prior to the first precipitation event of the rainy season.

Consideration shall be given to using these filtration units in other areas besides the parking lot inlets. Another potential location is at the downstream end of the tributary pipes that feed the discharge point. Siting these units at a downstream point would allow for the treatment of a greater amount of runoff.

CUMULATIVE

5.11-5 No mitigation measures are recommended.

9.0 Inventory of Significance After Mitigation

9.0 INVENTORY OF SIGNIFICANCE AFTER MITIGATION

LAND USE AND RELEVANT PLANNING

No unavoidable significant impacts related to Land Use and Relevant Planning have been identified following compliance with the San Bernardino County General Plan and Development Code policies and standards.

RECREATION

No significant impacts related to Recreational facilities have been identified in this Section.

PUBLIC SERVICES AND UTILITIES

Due to the inability of water providers to confirm service to the project, project as well as cumulative impacts are concluded as significant and unavoidable. This conclusion is further supported by the significant and unavoidable conclusion cited in Section 5.11, *Hydrology and Drainage*, due to inconclusive testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit.

If the County of San Bernardino approves the project, the County shall be required to adopt findings in accordance with Section 15091 of the CEQA Guidelines and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the CEQA Guidelines.

No additional unavoidable significant impacts related to public services and utilities have been identified following implementation of the recommended mitigation measures and compliance with applicable County, service or utility provider requirements, County Codes and Ordinances.

AESTHETICS/LIGHT AND GLARE

Significant and unavoidable impacts related to Aesthetics/Light and Glare have been identified for viewshed alterations involving existing residents to the north, east and west of the project site. Additionally, significant and unavoidable impacts have been identified for views from State Route 38, a scenic highway, to the south and from the south shore of Big Bear Lake. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA.

No additional significant impacts related to Aesthetic/Light and Glare have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

TRAFFIC AND CIRCULATION

Following implementation of recommended mitigation measures, Traffic and Circulation impacts would be reduced to a less than significant level.

AIR QUALITY

The following air quality impacts would remain significant and unavoidable following mitigation:

- ROG and NO_X from construction activities;
- Project Operations: Exceedance of State and/or Federal emission levels (ROG, CO and PM_{10}) from project operations; and
- Project implementation would result in a significant unavoidable impact with respect to consistency with the AQMP.

If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with Section 15093 of CEQA.

NOISE

No unavoidable significant impacts related to noise have been identified following implementation of recommended mitigation measures and compliance with applicable requirements set forth by the County of San Bernardino and the Big Bear Municipal Water District.

BIOLOGICAL RESOURCES

Significant and unavoidable impacts related Biological Resources have been identified for impacts to Bald Eagle populations. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA.

No additional significant impacts related to Biological Resources have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

CULTURAL RESOURCES

No significant impacts related to Cultural Resources have been identified following implementation of mitigation measures referenced in this Section.

GEOLOGY AND SOILS

No significant impacts related to Geology and Soils have been identified following implementation of mitigation measures and/or compliance with applicable standards,

policies and/or County of San Bernardino Development Code and standards set forth in the Uniform Building Code.

HYDROLOGY AND DRAINAGE

Due to inconclusive testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit, project and cumulative impacts are concluded to be significant and unavoidable.

If the County of San Bernardino approves the project, the County shall be required to adopt findings in accordance with Section 15091 of the CEQA Guidelines and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the CEQA Guidelines.

No additional significant impacts related to hydrology and water quality have been identified following implementation of the recommended mitigation measures and/or through regulatory compliance.

10.0 Effects Found Not To Be Significant

10.0 EFFECTS FOUND NOT TO BE SIGNIFICANT

The County of San Bernardino conducted an Initial Study in February, 2002 to determine significant effects of the project. In the course of this evaluation, certain impacts of the project were found to be less than significant due to the inability of a project of this scope to create such impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the Draft EIR. In accordance with CEQA Guidelines Section 15128, the following section provides a brief description of potential impacts found to be less than significant. A copy of the Initial Study is found in Appendix 15.1.

AGRICULTURAL RESOURCES

- *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?*

- *Conflict with existing zoning for agricultural use, or a Williamson Act contract?*

- *Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?*

The project site is not known to contain soils that have been designated as prime or unique agricultural soils and agricultural activities have not historically occurred at the project site. The project would not adversely impact prime or locally important agriculture as none occur within the project area. The entire site is zoned residential and is not under a Williamson Act contract. No further discussion of agricultural resources is required in an EIR.

BIOLOGICAL RESOURCES

- *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*

No habitat conservation plans exist in the project area; this project will therefore not pose any conflict with existing plans for biological resource conservation.

GEOLOGY AND SOILS

- *Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?*

The proposed project does not include the use of septic tanks or alternative wastewater disposal systems.

HAZARDS AND HAZARDOUS MATERIALS

- *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*

- *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*

- *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

The project is a residential subdivision that includes the development of a boat dock for use by the residents of the development project. The storage and use of boats and fuel would be typical of any residential land use. The boat dock would not be an improved marina or include the storage of any fuels on-site. No other hazardous materials would be stored on-site or transported through the property as a result of the subdivision. The project would not require additional analysis of hazardous materials in an EIR.

- *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*

The project site is not identified by the County of San Bernardino as a hazardous waste site (Map "Identified Hazardous Waste Sites," December 1, 1994). The County Fire Department HazMat Division responded to a Project Notice for Tentative Tract No. 16136 that "No hazardous materials conditions apply to this project" (July 24, 2001).

- *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?*

- *For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?*

The project is not located within an airport land use plan or within the flight path of the Big Bear Airport, which is located 3.5 miles to the east. There are no nearby airstrips. The proposed residential development would not pose a safety hazard for any residents or other visitors to the site resulting from proximity of the Big Bear airport.

LAND USE AND PLANNING

- *Physically divide an established community?*

The project lies within the community of Fawnskin. Fawnskin is primarily developed to the west of the project site, with scattered residences south and east of the site. Because the project and the entire community of Fawnskin is accessible via State Highway 38, there will be no physical division of the existing community.

- *Conflict with any applicable habitat conservation plan or natural community conservation plan?*

No habitat conservation or natural community conservation plans exist in the project area; this project will therefore not pose any conflict with existing plans for conservation.

MINERAL RESOURCES

- *Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?*

- *Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?*

The site is not within an area designated by the State for locally important mineral resources and it does not lie within the County of San Bernardino's Mineral Resource Zone. The San Bernardino Mountains however are rich in mineral resources; known occurrences include gold, silver, lead, zinc, iron, manganese, and tungsten. Claims have been operated extensively but most have been non productive for at least 15 years. Just north of the project site is Holcomb Valley where William F. Holcomb discovered placer gold in May 1860. The mapped gold placer area begins approximately 1.5 miles north of the project site's northeastern boundary and the nearest placer gold claim (Wayne Placers) is located in section 8, approximately one mile to the northeast. One-half mile to the northeast is a site (Polique Canyon) identified as metal prospect or nonmetallic deposit, which has not been operated. All other mapped claims, mines, and quarries are further to the north of the project site *(Geology of the San Bernardino Mountains North of Big Bear Lake, California, pp 51 – 67).* No impacts to mineral resources would occur as a result of the project's implementation.

NOISE

- *For a project located within an airport land use plan or, where such a plan has bet been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*

- *For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?*

The site is not within proximity to an airport or airstrip. The Big Bear City airport is located approximately 3 miles to the east of the Project site. No impact will occur from aviation noise.

POPULATION AND HOUSING

- *Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?*

- *Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?*

The project is a 95-lot residential development on currently vacant land. There would be no displacement of existing housing or people

TRANSPORTATION/TRAFFIC

- *Result in inadequate parking capacity?*

There is no public parking associated with the development project. Each individual lot would have typical residential parking provisions.

AIR TRAFFIC PATTERNS

- *Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.*

No changes to air traffic patterns would result from the proposed residential subdivision project.

- *Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).*

According to the Initial Study, the residential development would have no impact on existing public transportation systems or programs. No bike lanes exist in the vicinity of State Highway 38.

11.0 Organizations and Persons Consulted

11.0 ORGANIZATIONS AND PERSONS CONSULTED

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12.0 Bibliography

12.0 BIBLIOGRAPHY

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13.0 Mitigation Monitoring Program

13.0 MITIGATION MONITORING PROGRAM

Section 2.0 of this EIR identifies the mitigation measures that will be implemented to reduce the impacts associated with the Moon Camp Project. The California Environment Quality Act (CEQA) was amended in 1989 to add Section 21081.6, which requires a public agency to adopt a monitoring and reporting program for assessing and ensuring compliance with any required mitigation measures applied to proposed development. As stated in Section 21081.6 of the Public Resources Code,

> *". . . the public agency shall adopt a reporting or monitoring program for the changes to the project which it has adopted, or made a condition of project approval, in order to mitigate or avoid significant effects on the environment."*

Section 21081.6 provides general guidelines for implementing mitigation monitoring programs and indicates that specific reporting and/or monitoring requirements, to be enforced during project implementation, shall be defined prior to final certification of the EIR.

The mitigation monitoring table below lists those mitigation measures that may be included as conditions of approval for the project. These measures correspond to those outlined in Section 2.0 and discussed in Section 5.0. To ensure that the mitigation measures are properly implemented, a monitoring program has been devised which identifies the timing and responsibility for monitoring each measure. The developer will have the responsibility for implementing the measures, and the various County of San Bernardino departments will have the primary responsibility for monitoring and reporting the implementation of the mitigation measures.

MITIGATION MEASURE:
RECREATION 5.2-2 The proposed project shall be conditioned to incorporate a pedal path easement along the south side of North Shore Drive prior to map recordation.
IMPLEMENTATION AND VERIFICATION:
1) Pedestrian easement must be incorporated into the site design. 2) Plans must be submitted to the Planning Division for review and approval. 3) The Planning Division shall verify compliance with the approved site design.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) The easement shall be included on the tract map prior to map recordation.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
PUBLIC SERVICES AND UTILITIES 5.3-1a The fire flow requirement shall be 1750 gpm @ 2 hours based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm @ 2 hours for homes greater than 4,800 square feet.
IMPLEMENTATION AND VERIFICATION:
1) Submit evidence to the County of San Bernardino Fire Department that the water pressure meets the required fire flow. 2) The County of San Bernardino Fire Department shall verify compliance during site inspections. 3) Fire flow requirements during construction shall meet San Bernardino County Fire Department requirements.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to construction. 2) Prior to Occupancy. 3) During construction.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
PUBLIC SERVICES AND UTILITIES 5.3-1b All residences less than 5,000 square feet shall be subject to the standard fire sprinkler requirement (NFPA 13D). Homes above 5,000 square feet shall be subject to the NFPA13R sprinkler requirement.
IMPLEMENTATION AND VERIFICATION:
1) A note on the CDP shall list this requirement. 2) Submit evidence to the County Fire Department that all homes adhere to the respective sprinkler requirement. 3) The County of San Bernardino Fire Department shall verify compliance during site inspection.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of final map. 2) Prior to recordation of final map. 3) Prior to Occupancy.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
PUBLIC SERVICES AND UTILITIES 5.3-1c A Fuels Management Plan, with specifications, shall be prepared and subject to approval by the County of San Bernardino Fire Department and San Bernardino National Forest Service. The Fuels Management Plan shall implement the fire safety requirements of the FS1 Fire Safety Overlay District, including a 30-foot minimum setback requirement from the National Forest. The fuel modification zone shall be located entirely within the project's boundaries. The minimum fuel modification zone requirements may be greater in steeper areas (up to 300 ft.), as determined by the Fire Department.
IMPLEMENTATION AND VERIFICATION:
1) Submit a Fuels Management Plan to the County of San Bernardino Fire Department and San Bernardino National Forest Service. 2) The County of San Bernardino Fire Department and San Bernardino National Forest Service shall verify compliance with approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the final map. 2) Prior to recordation of the final map.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
PUBLIC SERVICES AND UTILITIES 5.3-1d Cul-de-sac lengths shall be no longer than 350 feet.			
IMPLEMENTATION AND VERIFICATION:			
1) Final map shall reflect compliance in road design. 2) Submit copy of building plans to the Building and Safety Division for approval. 3) The Building and Safety Division shall verify compliance with approved plans during site inspections.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to recordation of the final map. 2) Prior to the issuance of grading permits/road improvement plans. 3) Prior to Occupancy.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
PUBLIC SERVICES AND UTILITIES 5.3-1e A Homeowner's Association or a Special District shall be established to implement the Fuels Management Plan. The Fuels Management Plan shall specify any professional assistance, if necessary, to implement the action portion of the plan. The Plan shall determine if a Registered Professional Forrester is necessary for professional guidance to implement the Plan. The HOA or Special District is to be responsible for fuel modification in common areas.
IMPLEMENTATION AND VERIFICATION:
1) Establish a Homeowner's Association or Special District to implement the Fuels Management Plan. 2) The County of San Bernardino Fire Department and the San Bernardino National Forest Service shall verify compliance with the implementation of the Fuels Management Plan by the HOA or Special District.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the final map. 2) Prior to Recordation.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
PUBLIC SERVICES AND UTILITIES 5.3-5a Prior to issuance of building permits, the Project Applicant shall fund all on-site and off-site sewer improvements required to support development of the Project site. Such improvements shall be to the satisfaction of the BBARWA, and may include replacement of existing sewer lines rather than construction of parallel lines.
IMPLEMENTATION AND VERIFICATION:
1) Submit funding to BBARWA for all on-site and off-site sewer improvements required to support development of the Project site. 2) The applicant shall submit to the County Planning Division copies of funding payments to BBARWA for sewer improvements, thereby documenting/verifying the funding payments made.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the issuance of building permits. 2) Prior to the issuance of building permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
PUBLIC SERVICES AND UTILITIES 5.3-5b Prior to issuance of building permits, the Project Applicant shall provide evidence to the County of San Bernardino that the BBARWA has sufficient transmission and treatment plant capacity to accept sewage flows from the Project site.
IMPLEMENTATION AND VERIFICATION:
1) Applicant shall submit evidence that BBARWA has sufficient capacity to accept flows from the Project site. 2) The Department of Special Districts and/or BBARWA shall verify compliance with the approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the issuance of grading permits. 2) Prior to the issuance of building permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
PUBLIC SERVICES AND UTILITIES 5.3-5c The Project Applicant shall relocate the BBARWA 10" force main by installing new pipe (and/or bonding for the relocation) so that it is aligned within the south shoulder of the relocated State Route 38. The 10" force main shall be accessible for BBARWA to maintain and repair the sewer force main. The force main shall not pass through residential lots within the proposed tract.
IMPLEMENTATION AND VERIFICATION:
1) Relocate sewer mains to be aligned with SR-38; and/or bond for the relocation. 2) The Department of Special Districts and/ or BBARWA shall verify compliance with the improved plans.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the recordation of the final map. 2) Prior to the recordation of the final map.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
PUBLIC SERVICES AND UTILITIES 5.3-5d The Project Applicant shall install air release valves and vaults at high elevation points on the new force main to minimize odors. Air release valves shall be large enough to enclose 55-gallon drum carbon filters to control odors.			
IMPLEMENTATION AND VERIFICATION:			
1) Submit evidence to the Building and Safety Division that air-release valves have been installed. 2) The Building and Safety Division shall verify compliance with the approved plans.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to recordation of the final map. 2) Prior to recordation of the final map.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
PUBLIC SERVICES AND UTILITIES 5.3-6a Values of production rates and pumping levels for on-site water supply wells shall be obtained through step-drawdown and constant rate pumping tests. Water samples shall be taken during the inspection for testing and analysis in accordance with standard requirements.
IMPLEMENTATION AND VERIFICATION:
1) Submit production rates and pumping levels through pumping tests to the Division of Environmental Health Services and the County Geologist. 2) Division of Environmental Health Services and the County Geologist shall verify compliance with approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the approval of building permits. 2) Prior to the approval of building permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
PUBLIC SERVICES AND UTILITIES 5.3-6b If either or both of the two existing on-site wells are utilized as a water source for the project, the Project Applicant shall equip the wells to meet DWP and/or County Special Districts Department standards and dedicate these facilities and water rights to the appropriate water purveyor. Within the proposed tract, no individual private irrigation wells shall be permitted.
IMPLEMENTATION AND VERIFICATION:
1) Wells must be equipped to meet DWP and/or County Special Districts Department standards. 2) Water rights must be dedicated to the appropriate water purveyor. 3) The DWP and/or County Special Districts shall verify compliance with approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the approval of building permits. 2) Prior to recordation of the final tract map. 3) Prior to the approval of building permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
PUBLIC SERVICES AND UTILITIES 5.3-6c After a determination has been made regarding the water purveyor, the Project Applicant shall advance fair-share funds to the appropriate water agency (CSA and/or DWP) towards constructing a new reservoir and pipeline improvement at Cline-Miller Reservoir (with an estimated project cost at $481,100). These facilities would be dedicated to the appropriate water agency.			
IMPLEMENTATION AND VERIFICATION:			
1) Applicant shall advance fair-share funds towards constructing a new reservoir and pipeline improvement. 2) These facilities shall be dedicated to the appropriate water agency. 3) The applicant shall submit evidence/verification documenting that fair-share funds have been deposited (to CSA and/or DWP) and that the facilities have been dedicated to the appropriate water agency.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to the issuance of building permits. 2) Prior to the issuance of building permits. 3) Prior to the issuance of building permits.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:

PUBLIC SERVICES AND UTILITIES

5.3-6d The following water conservation measures are the minimum measures that shall be complied with in conjunction with domestic water supply to the project. A Homeowners Association shall be responsible for enforcing the water conservation measures. Additional measures may be imposed as a result of a contract for water supply between CSA 53-C and the City of Big Bear Lake DWP:

- Landscape shall not be irrigated between the hours of 9:00 a.m. and 6:00 p.m.
- Residences, buildings and premises shall be limited to watering every other day.
- Landscape irrigation shall be limited to what is needed and shall not be excessive. Water from landscape irrigation shall not be allowed to run off into streets.
- Water shall not be allowed to leak from any waterline, faucet, or any other facility, either within or outside a private residence, business establishment or on private property. All such leaking waterlines, faucets, and other facilities shall be repaired immediately to prevent leakage.
- Sidewalks, paved driveways, and parkways shall not be washed off with hoses, except as required for sanitary purposes.
- Non-commercial washing of cars, and boats or any other vehicle shall only be done with an automatic shut-off nozzle on a hose, or with a bucket.
- New landscaping shall not exceed more than one-thousand square feet of turf on a parcel or lot or twenty-five percent of the available landscape area.
- A model landscaping and irrigation guide shall be prepared for the tract and required by homeowner association rules. The guide shall specify a plant palate that emphasizes native plants and cultivars that are suitable for the mountain climate. Plant materials shall be low water consuming and fire resistant. Irrigation shall emphasize drip and bubbler type emitters with limit aerial spray irrigation methods. The guide shall be reviewed and approved by the Land Use Services Department.

IMPLEMENTATION AND VERIFICATION:

1) Applicant shall submit evidence to the Planning Division that water conservation measures are included within the HOAs Conditions Covenants and Restrictions (CC&Rs).
2) The applicant shall submit evidence/documentation to the Planning Division verifying that the Homeowners Association CC&Rs includes provisions requiring compliance with the approved water conservation measures.

COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the final map. 2) Prior to recordation of the final map.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-1a Construction equipment staging areas shall be located away from existing residential uses. Appropriate screening (i.e., temporary fencing with opaque material) shall be used to buffer views of construction equipment and material, when feasible. Staging locations shall be indicated on project Grading Plans.
IMPLEMENTATION AND VERIFICATION:
1) Locate construction staging areas away from residential uses. 2) Utilize appropriate screening for construction staging areas. 3) Indicate staging locations on the grading plan, erosion control plan and/or SWWP. 4) The Building and Safety Division shall verify compliance with the approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) During Construction. 2) During Construction. 3) During Construction. 4) During Construction.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-1b All construction-related lighting associated with the construction of new roadways, the realignment of State Route 38, and the installation of utilities shall be located and aimed away from adjacent residential areas. Lighting shall use the minimum wattage necessary to provide safety at the construction site. A construction safety lighting plan shall be submitted to the county for review concomitant with Grading Permit applications for the subdivision of the lots.
IMPLEMENTATION AND VERIFICATION:
1) Locate and aim constructed-related lighting away from residential areas. 2) Lighting shall use minimum wattage necessary. 3) Submit a construction safety lighting plan to the county for review. 4) The Building and Safety Division shall verify compliance with approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) During Construction. 2) During Construction. 3) Prior to the issuance of Grading Permits. 4) During construction.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
AESTHETICS/LIGHT AND GLARE 5.4-2a Roof pitches shall not exceed 9/12 and no higher than two-story for any portion of the structure footprint for lots 62-92.			
IMPLEMENTATION AND VERIFICATION:			
1) Provide a note on the Composite Development Plan listing this requirement. 2) Submit a copy of the appropriate plans to the Building and Safety Division for approval. 3) The Building and Safety Division shall verify compliance with the approved plans during site inspections.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to recordation. 2) Prior to the issuance of building permits. 3) During Construction.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:			
AESTHETICS/LIGHT AND GLARE 5.4-2b All homes shall provide a two-car garage with automatic garage doors.			
IMPLEMENTATION AND VERIFICATION:			
1) Provide a note on the Composite Development Plan listing this requirement. 2) Submit a copy of the appropriate plans to the Building and Safety Division for approval. 3) The Building and Safety Division shall verify compliance during site inspection.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to recordation of the final map. 2) Prior to the issuance of building permits. 3) During construction.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-2c A view envelope for each property shall be established by creating a line starting at 6 feet at each side lot line and moving up at a 30 degree angle until both lines meet at the middle of the property. The area located under these lines is the view envelope. Structures shall not protrude outside the view envelope. The view envelope orients the building ridgeline parallel to the view corridors on narrower lots providing views for residents located behind the property.
IMPLEMENTATION AND VERIFICATION:
1) Establish a view envelope. 2) Structures must not protrude outside the envelope. 3) Delineate on the Composite Development Plan. 4) Submit plans to the Planning and Building and Safety Division for approval. 5) The Planning and Building and Safety Division shall verify compliance during site inspection.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the recordation of the final map. 2) Prior to the recordation of the final map. 3) Prior to the recordation of the final map. 4) Prior to issuance of Building Permits. 5) During construction.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-2d New development shall be subordinate to the natural setting and minimize reflective surfaces. Building materials including siding and roof materials shall be selected to blend in hue and brightness with the surroundings. Colors shall be earth tones, shades of grays, tans, browns, greens, pale yellows, and shall be consistent with the mountain character of the area.
IMPLEMENTATION AND VERIFICATION:
1) Colors must be consistent with the mountain character of the area. 2) Establish (include this measure) in the Home Owners Association Conditions Covenants and Restrictions. 3) Provide a note on the Composite Development Plan listing this requirement. 4) Design guidelines and plans must be submitted to the Planning and Building and Safety Division for approval.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) On-going. 2) Prior to recordation of the final map. 3) Prior to recordation of the final map. 4) Prior to the issuance of building permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-2e Outside parking/storage areas associated with the boat dock activities shall be completely screened from view by the placement of landscaping and plantings which are compatible with the local environment and, where practicable, are capable of surviving with a minimum of maintenance and supplemental water.
IMPLEMENTATION AND VERIFICATION:
1) Parking and storage areas associated with boat dock activities must be screened from view. 2) Specify (include this measure) in the Homeowners Association Conditions Covenants and Restrictions. 3) Submit a copy of landscape plans to the Planning Division for approval. 4) The Building and Safety Division shall verify compliance with approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) On-going. 2) Prior to the recordation of the final map. 3) Prior to issuance of Grading Permits. 4) Prior to occupancy of the first residential unit.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-2f Construction plans for each individual lot shall include the identification and placement of vegetation with the mature height of trees listed. Landscaping and plantings should not obstruct significant views, within or outside of the project, either when installed or when they reach mature growth. The removal of existing vegetation shall not be required to create views.
IMPLEMENTATION AND VERIFICATION:
1) Provide a note on the Composite Development Plan listing this requirement. 2) Landscape plans must be submitted to the Planning Division for review. 3) The Building and Safety Division shall verify compliance with approved plans during the site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the final map. 2) Prior to the issuance of building permits. 3) Prior to the issuance of Occupancy Permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-2g A Note shall be placed on the Composite Development Plan stating that during construction plans review and prior to issuance of building permits for each lot, the building inspector shall refer to the Mitigation Monitoring and Compliance Program regarding these aesthetic impact mitigation measures. The building inspector shall coordinate with the Advance Planning Division the review and approval of building plans in relation to these aesthetic impact mitigation measures, prior to approval and issuance of building permits.
IMPLEMENTATION AND VERIFICATION:
1) The Building and Safety Division must review building plans in relation to aesthetic impact mitigation measures. 2) The Building and Safety Division shall verify compliance with the approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to approval and issuance of building permits. 2) Prior to occupancy.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-3a Any entry sign for the development shall be a monument style sign compatible with the mountain character, preferably, rock or rock-appearance.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall include all proposed signage (compatible with the mountain character), on the landscaping plan. 2) The Building and Safety Division shall verify compliance during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to approval of the Landscape Plan. 2) Prior to occupancy of the first residential unit.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-3b Prior to recordation of the tract map (and/or any ground disturbance, whichever occurs first), landscaping plans for lettered lots B and C shall be submitted to and approved by the San Bernardino County Planning Department.
IMPLEMENTATION AND VERIFICATION:
1) Landscaping plans shall be submitted to the San Bernardino County Planning Division for review and approval. 2) The San Bernardino County Building and Safety Division shall verify compliance with the approved plans during site inspection.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the recordation of the tract map. 2) Prior to occupancy of the first residential unit.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-4a All exterior lighting shall be designed and located as to avoid intrusive effects on adjacent residential properties and undeveloped areas adjacent to the project site. Low-intensity street lighting and low-intensity exterior lighting shall be used throughout the development to the extent feasible. Lighting fixtures shall use shielding, if necessary to prevent spill lighting on adjacent off-site uses.
IMPLEMENTATION AND VERIFICATION:
1) The intrusive effects of exterior lighting shall be minimized. 2) The Building and Safety Division shall verify compliance during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) On-going. 2) Prior to the issuance of building permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-4b Lighting used for various components of the development plan shall be reviewed for light intensity levels, fixture height, fixture location and design by an independent engineer, and reviewed and approved by the County Building and Safety Division.
IMPLEMENTATION AND VERIFICATION:
1) The various lighting components of the development plan shall be submitted to the County Building and Safety Division for review and approval. 2) The Building and Safety Division shall verify compliance with the approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the issuance of Building Permits. 2) During Construction.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-4c The project shall use minimally reflective glass. All other materials used on exterior buildings and structures shall be selected with attention to minimizing reflective glare.
IMPLEMENTATION AND VERIFICATION:
1) Submit a copy of CC&Rs and/or design guidelines to the Planning Division for review and approval. 2) Provide a note on the Composite Development Plan listing this requirement. 3) The Building and Safety Division shall verify compliance during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the recordation of the final map. 2) Prior to recordation of the final map. 3) During Construction.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-4d Vegetated buffers shall be used along State Route 38 to reduce light intrusion on residential development and on forested areas located adjacent to the project site.
IMPLEMENTATION AND VERIFICATION:
1) Vegetation buffers on the open space lots shall be included on the Landscaping Plans which shall be submitted to the San Bernardino County Planning Division for review and approval. 2) Vegetation Buffers on individual lots adjacent to State Route 38 shall be included in the CC&Rs. 3) These vegetation buffers will be verified by the Building and Safety Division.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to approval of the Landscaping Plan. 2) Prior to recordation of the final map. 3) Prior to issuance of occupancy permits (for residential lots adjacent to State Highway 38).

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
AESTHETICS/LIGHT AND GLARE 5.4-4e Mitigation Measures 5.4-4a through 5.4-4d shall be included within the Conditions, Covenants and Restrictions (CC&Rs) of the Home Owner's Association (HOA).			
IMPLEMENTATION AND VERIFICATION:			
1) Submit a copy of the CC&Rs to the Planning Division for review and approval. 2) Building and Safety Division shall verify compliance with approved CC&Rs during site inspection.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to recordation of final map. 2) During construction.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-4f All outdoor light fixtures shall be cutoff luminaries and shall only use high- or low-pressure sodium lamps.
IMPLEMENTATION AND VERIFICATION:
1) Submit a copy of the CC&Rs and/or design guidelines to the Planning Division for review and approval. 2) The Building and Safety Division shall verify compliance with approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of final map. 2) During Construction.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AESTHETICS/LIGHT AND GLARE 5.4-4g The Project Applicant/Developer shall install light colored, reflective roof products. Such roofs shall utilize light colored, reflective materials that meet the performance standards developed by the Energy Star Labeled Roof Program, as well as the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standards 90.1 and 90.2 on energy efficient buildings. This condition shall be verified by the County of San Bernardino Building and Safety Division prior to issuance of building permits.
IMPLEMENTATION AND VERIFICATION:
1) Submit a copy of the CC&Rs and/or design guidelines to the Planning Division for review and approval. 2) Provide a note on the Composite Development Plan listing this requirement. 3) The Building and Safety Division shall verify compliance with approved plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the final map. 2) Prior to recordation of the final map. 3) During construction.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
TRAFFIC AND CIRCULATION 5.5-1 For existing traffic conditions, the intersection of Stanfield Cutoff and Big Bear Boulevard currently requires the eastbound right turn lane to be converted to an eastbound through lane, through the intersection. The eastbound right turn lane is restricted to an eastbound through lane, and involves roadway widening. The project's pro rata share of these off-site road improvements is estimated to be $17,748.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit evidence to the Planning Division that the project's pro rata share of off-site road improvements has been satisfied.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the issuance of building permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
TRAFFIC AND CIRCULATION 5.5-3 For future traffic conditions, the intersection of Stanfield Cutoff and North Shore Drive shall require a traffic signal. The project's pro rata share of the signal is $56,523.			
IMPLEMENTATION AND VERIFICATION:			
1) The applicant shall submit evidence to the Planning Division that the project's pro rata share of off-site road improvements has been satisfied.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to the issuance of building permits.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
TRAFFIC AND CIRCULATION 5.5-4a Parking shall be restricted on State Route 38.			
IMPLEMENTATION AND VERIFICATION:			
1) The applicant shall submit evidence to the Planning Division that parking is restricted on State Route 38.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to the issuance of building permits.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
TRAFFIC AND CIRCULATION 5.5-4b A 150-foot eastbound left turn pocket shall be striped for traffic on North Shore Drive turning left into the project entry locations.
IMPLEMENTATION AND VERIFICATION:
1) Submit evidence of left turn pocket to the Department of Public Works, and the Department of Public Works shall verify compliance.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the occupancy of the first residential unit.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
TRAFFIC AND CIRCULATION 5.5-4c For future traffic conditions, intersection geometrics as recommended in Table 1b of the Kunzman Associates June 2003 *Traffic Analysis report*, shall be implemented.			
IMPLEMENTATION AND VERIFICATION:			
1) Submit intersection geometries to the Department of Public Works for review and approval and, the Department of Public Works shall verify intersection geometries.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to the recordation of the final map.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:			
TRAFFIC AND CIRCULATION 5.5-4d All streets internal to the project shall be constructed to full ultimate cross-sections.			
IMPLEMENTATION AND VERIFICATION:			
1) Submit evidence of compliance to the Department of Public Works and, the Department of Public Works shall verify compliance.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to the issuance of the first building permit.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:			
TRAFFIC AND CIRCULATION 5.5-4e A STOP sign shall be installed to control outbound traffic on all site access roadways onto North Shore Drive.			
IMPLEMENTATION AND VERIFICATION:			
1) Submit evidence of stop sign installation on access roadways, to the Department of Public Works and, the Department of Public Works shall verify compliance.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to the occupancy of the first residential unit.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:			
TRAFFIC AND CIRCULATION 5.5-4f The County of San Bernardino shall periodically review traffic operations in the vicinity of the site once the project is constructed in order to assure that the traffic operations are satisfactory.			
IMPLEMENTATION AND VERIFICATION:			
1) The County of San Bernardino Public Works Department shall verify compliance with the mitigation measure.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) During Project implementation.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
TRAFFIC AND CIRCULATION 5.5-4g Landscape plantings and signs shall be limited to 36 inches in height within 25 feet of project driveways to assure good visibility.
IMPLEMENTATION AND VERIFICATION:
1) Applicant shall submit a copy of CC&Rs to the Planning Division for review and approval. 2) Limitations on landscape plantings and signs on individual lots shall be included in the CC&Rs. Compliance with these limitations will be verified by the Building and Safety Division.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the recordation of the final tract map. 2) Prior to the issuance of building permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AIR QUALITY 5.6-1 In accordance with the County Development Code and SCAQMD Rules, the Project Applicant shall incorporate the following measures during the construction phase of the Project to the satisfaction of the SCAQMD and County of San Bernardino. Compliance with this measure is subject to periodic field inspections by the SCAQMD and County of San Bernardino. Grading: ▪ Apply non-toxic soil stabilizers according to manufacturer's specifications to all inactive construction areas (previously graded for ten days or more); ▪ Replace ground cover in disturbed areas as quickly as possible; ▪ Enclose, cover, water two times daily or apply non-toxic soil binders in accordance to manufacturer's specifications to exposed piles (i.e., gravel, sand, dirt) with 5% or greater silt content; ▪ Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph; and ▪ All trucks hauling dirt, sand, soil, or other loose materials shall be covered and shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer). Paved Roads: ▪ Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads.
IMPLEMENTATION AND VERIFICATION:
1) Submit evidence to the Building and Safety Division that mitigation measures are being implemented. 2) The Building and Safety Division shall verify compliance with the mitigation measure.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) During the construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
AIR QUALITY 5.6-2 To the extent feasible, the project shall incorporate the installation of EPA-certified wood burning stoves or fireplaces. If this is not feasible, then the installation of a ceramic coating on the honeycomb inside a catalytic combustor shall be investigated as a feasible alternative. Alternatively, the use of natural gas fireplaces may be used as a feasible alternative.
IMPLEMENTATION AND VERIFICATION:
1) Provide a note on the Composite Development Plan and include in the Conditions Covenants and Restrictions. 2) Submit evidence of the installation of appropriate heating devices. 3) The Building and Safety Division shall verify installation during site inspection.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to Recordation. 2) During the construction phase. 3) During the construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
NOISE 5.7-1a Construction activities shall be limited to the hours of 7:00 a.m. to 7:00 p.m. Monday to Saturday and prohibited on Sundays and Federal Holidays.
IMPLEMENTATION AND VERIFICATION:
1) Applicant shall submit evidence of construction hours to the Building and Safety Division, and include the limitation of construction hours on all grading plans. 2) The Building and Safety Division shall verify construction does not take place during prohibited times.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to issuance of grading permits. 2) During the construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
NOISE 5.7-1b All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the County Engineer.			
IMPLEMENTATION AND VERIFICATION:			
1) Submit evidence of properly operating and maintained mufflers on all construction equipment to the County Building and Safety Division. 2) The County Building and Safety Division shall verify compliance with the mitigation measure.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) During the construction phase. 2) During the construction phase.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:			
NOISE 5.7-1c Stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receptors, to the satisfaction of the County Engineer.			
IMPLEMENTATION AND VERIFICATION:			
1) The County Building and Safety Division shall verify emitted noise is directed away from sensitive receptors during site inspection.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) During the construction phase.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
NOISE 5.7-1d Stockpiling and staging areas shall be located as far as practical from noise sensitive receptors during construction activities, to the satisfaction of the County Engineer.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit evidence to the County Building and Safety Division that construction staging areas are located away from sensitive receptors. The applicant shall indicate the location of the construction staging areas on the grading plans, erosion control plans, and/or SWWP. 2) The County Building and Safety Division shall verify that staging areas are not located near sensitive receptors during site inspection.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to issuance of grading permits. 2) During the construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-1a Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented. Pebble plain habitat acreages will be recalculated following the survey using criteria established by the Habitat Management Guide for Pebble Plain Habitat on the National Forest System (2002). Should avoidance/retention on-site of the 4.91 acres of Pebble Plain habitat in permanent open space under a Conservation Easement Agreement not occur, the Project Applicant shall pay compensation for the loss of special status botanical resources identified on the project site during the survey by funding the purchase, establishment of a conservation easement, and management of off-site habitat within the conservation easement by an entity approved by the CDFG. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio of 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development). Prior to the initiation of clearing or grading activities on the project site, the conservation easement will be established, the management entity will be approved by the CDFG, and a non-wasting endowment will be established for the monitoring and management of the preservation site by the management entity in perpetuity. If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the Project Applicant is responsible for mitigating impacts to a minimum of 11.8-acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the Federally-listed Threatened ash-gray Indian paintbrush. As such, the applicant would be required to fund the purchase and maintenance of 35.4-acres of offsite pebble plain and open Jeffrey pine forest habitat that contains special status plant species, including Ash-gray Indian paintbrush and others known to occur on the site.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit evidence of biological surveys to the Planning Division. 2) The conservation easement(s) shall be established and recorded on the tract map. 3) The applicant shall submit evidence to the County Planning Division that the conservation easement(s) is/are established, the management entity is approved, and a non-wasting endowment is established for the monitoring and management of the preservation site by the management entity in perpetuity.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to vegetation clearing, grading, or other disturbance. 2) Prior to recordation of the tract map 3) Prior to vegetation clearing, grading, or any other land disturbance.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.

APPROVED BY:		DATE APPROVED:	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-1b Trees identified on Exhibits 3 and 4 of the Bald Eagle Survey Report (Appendix E, see attached) as eagle perch locations shall be preserved in place upon project completion and shall not be removed under any circumstances. Any development that may occur within the project site and in the individual lots must avoid impacts to these trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall include this measure as a note on the Composite Development Plan. 2) The Building and Safety Division shall verify the implementation of appropriate tree preservation during construction.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation. 2) During the construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-1c Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed to identify all large trees (i.e., greater than 20-inches in diameter at 4.5 feet from the ground) within 600 feet from the high water line. Trees identified on the project site as having a diameter in excess of 20-inches at four feet from the ground within 600 feet of the shoreline shall be documented and tagged. Any development that may occur within the project site and in the individual lots must avoid impacts to tagged trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall include this measure as a note on the Composite Development Plan. 2) Forester to perform and certify compliance. 3) The applicant shall submit evidence to the Planning Division that tagged trees are protected. 4) The Building and Safety Division shall verify tree protection during site inspection.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the tract map. 2) Prior to vegetation clearing, grading, or any other land disturbance. 3) Prior to vegetation clearing, grading, or any other land disturbance. 4) During the construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-1d Seven days prior to the onset of construction activities, a qualified biologist shall survey within the limits of project disturbance for the presence of any active raptor nests. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG. If nesting activity is present at any raptor nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for raptors in the region of the project site normally occurs from February 1 to June 30. To protect any nest site, the following restrictions on construction are required between February 1 and June 30 (or until nests are no longer active as determined by a qualified biologist): (1) clearing limits shall be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying shall not be allowed within 200 feet of any occupied nest. Any encroachment into the 300/200 foot buffer area around the known nest shall only be allowed if it is determined by a qualified biologist that the proposed activity shall not disturb the nest occupants. Construction during the nesting season can occur only at the sites if a qualified biologist has determined that fledglings have left the nest.
IMPLEMENTATION AND VERIFICATION:
1) Submit evidence of biologist consultant services contract/agreement. 2) The applicant shall submit evidence of biological surveys to the Planning Division. 3) The Planning Division shall verify that no active raptor nests were found.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to issuance of building permits. 2) Prior to initiating the construction phase. 3) Prior to initiating the construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
BIOLOGICAL RESOURCES 5.8-1e Vegetation removal, clearing, and grading on the project site shall be performed outside of the breeding and nesting season (between March and September) to minimize the effects of these activities on breeding activities of migratory birds and other species.			
IMPLEMENTATION AND VERIFICATION:			
1) The applicant shall include a note on the grading plans that vegetation removal and grading will be performed outside the breeding season (i.e., March to September). 2) Applicant shall submit evidence to the Planning Division that vegetation removal and grading will be performed outside the breeding season. 3) The Building and Safety Division shall verify compliance during construction/grading.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to issuance of grading permits. 2) Prior to issuance of grading permits. 3) During the construction phase.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-1f The use of the boat dock for motorized boating shall be prohibited between the dates of December 1 and April 1. No motorized boats shall be allowed to launch or moor in the vicinity of the boat dock at any time during this period. This restriction shall be clearly displayed on signage at the entrance to the parking lot and on the boat dock visible from both land and water. This requirement shall also be published in the Homeowner's Association CC&Rs.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit to the Planning Division a copy of the HOAs CC&Rs inclusive of the restriction of this measure. 2) The applicant shall install the required signage.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the tract map. 2) During project construction, and prior to use of the boat dock.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-2a Street lamps on the project site shall not exceed 20 feet in height, shall be fully shielded to focus light onto the street surface and shall avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights shall utilize low color temperature lighting (e.g., red or orange).
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit evidence to the Planning Division that street lamps conform to the guidelines. 2) The Public Works Division shall verify that street lamps conform to these guidelines.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to final approval of road improvement plans. 2) During the construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-2b Outdoor lighting for proposed homes on the individual tentative tracts shall not exceed 1,000 lumens. Furthermore, residential outdoor lighting shall not exceed 20 feet in height and must be shielded and focused downward to avoid lighting spillover onto adjacent open space or properties. These restrictions on outdoor lighting of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This requirement shall also be published in the Homeowner's Association CC&Rs.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit to the Planning Division a copy of the HOA's CC&Rs inclusive of the restriction of this measure. 2) The individual lot owners shall submit evidence to the Building and Safety Division that the outdoor lighting conforms to these guidelines.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the tract map. 2) During the construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-2c To limit the amount of human disturbance on adjacent natural open space areas, signs shall be posted along the northeastern and eastern perimeter of the project site where the property boundary abuts open space with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash at all times." In addition, a requirement stating that residents shall keep out of adjacent open space areas to the north with the exception of designated trails will be published in the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents.
IMPLEMENTATION AND VERIFICATION:
1) Sign design and text message shall be included in the Landscape Plan submitted to the Planning Division for review and approval. 2) The applicant shall submit to the Planning Division a copy of the HOA's CC&Rs, inclusive of the restrictions of this measure. 3) The applicant shall install the signs.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the tract map. 2) Prior to recordation of the tract map. 3) Prior to issuance of the first occupancy permit.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-2d Prior to recordation of the final map, a landscaping plan for the entire tract shall be prepared (inclusive of a plant palette) with native trees and plant species, and, shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review shall determine that no non-native or invasive plant species are to be used in the proposed landscaping. The biologist should suggest appropriate native plant substitutes. A note shall be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform with the overall approved tract map landscaping plan. A requirement shall be included stating that residents shall include a restriction of the use of tree and plant species to only native trees/plants approved per the overall tract map landscaping plan, the Homeowner Association CC&Rs shall also restrict (individual lot owners) to use only native tree and plant species approved per the overall tract map landscaping plan.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit a landscaping plan for the entire tract for review and approval by a qualified biologist, prior to recordation of the final map. 2) The applicant shall include a note on the Composite Development Plan indicating the approved native plant materials. 3) The applicant shall submit a copy of the HOA's CC&Rs, inclusive of the restrictions of this measure to the Planning Division and Building and Safety Division. 4) The individual lot owners shall submit landscaping plans (which conform with the overall approved tract map landscaping plan) to the Planning Division and Building and Safety Division for review and approval.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the final tract map. 2) Prior to recordation of the final tract map. 3) Prior to recordation of the final tract map. 4) Prior to the issuance of individual building permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-2e Garages with automatic door openers shall be required. No exterior construction, grading or vegetation clearing shall be permitted between December 1 and April 1, which is the wintering period for bald eagles (i.e., the season when bald eagles are present in the Big Bear area).
IMPLEMENTATION AND VERIFICATION:
1) The applicant and/or subsequent individual lot owners shall submit evidence that automatic garage door openers are installed. 2) The applicant and/or subsequent individual lot owners shall not perform any exterior construction, grading, or vegetation clearing between December 1 and April 1, which will be verified by the Building and Safety Division. 3) Both requirements shall be noted on the Composite Development Plan and included in the Homeowners Association Conditions Covenants and Restrictions.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to issuance of occupancy permits. 2) During the construction phase. 3) Prior to Recordation.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
BIOLOGICAL RESOURCES 5.8-3 Per the direction of the California Department of Fish and Game, all unavoidable impacts to State and Federal jurisdictional lakes, streams, and associated habitat shall be compensated for with the creation and/or restoration of in-kind habitat on-site and/or off-site at a minimum 3:1 replacement-to-impact ratio. Additional requirements may be required through the permitting process depending on the quality of habitat impacted, project design and other factors.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit evidence (copies) of the required Federal and State Resources Agency's Permits (inclusive of details of compensation habitat), to the San Bernardino County Planning Division.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to issuance of grading permits, vegetation removal, and/or any other land-disturbing activity.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
CULTURAL RESOURCES 5.9-1 Project-related grading, grubbing, trenching, excavations, and/or other earth-moving activities in the project area shall be monitored by a qualified archaeologist. In the event that a material of potential cultural significance is uncovered during such activities on the project site, all earth-moving activities in the project area shall cease and the archeologist shall evaluate the quality and significance of the material. Earth-moving activities shall not continue in the area where a material of potential cultural significance is uncovered until resources have been completely removed by the archaeologist and recorded as appropriate.			
IMPLEMENTATION AND VERIFICATION:			
1) The applicant shall submit to the Planning Division a copy of a contract with a qualified archaeologist. 2) A qualified archaeologist shall perform the field monitoring. 3) The applicant shall submit the qualified archaeologists report of findings to the County Planning Division.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to grading, vegetation removal, and/or any other land-disturbing activity. 2) During the construction phase. 3) During the construction phrase.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
CULTURAL RESOURCES 5.9-2a Grading shall be monitored during excavation in areas identified as likely to contain paleontologic resources by a qualified paleontological monitor. Monitoring shall be accomplished for any undisturbed subsurface older alluvium, which might be present in the subsurface. The monitor shall be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments which are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert grading equipment to allow for removal of abundant or large specimens.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit to the Planning Division a copy of a contract with a qualified paleontologist. 2) A qualified paleontologist shall perform the field monitoring. 3) The applicant shall submit the qualified paleontologist's report of findings to the County Planning Division.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to grading, vegetation removal, and/or any other land-disturbing activity. 2) During the grading phase. 3) During the grading phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
CULTURAL RESOURCES 5.9-2b Recovered specimens shall be prepared to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.			
IMPLEMENTATION AND VERIFICATION:			
1) Submit evidence to the Planning Division that recovered specimens will be preserved.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) During the construction phase.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:			
CULTURAL RESOURCES 5.9-2c Identification and curation of specimens into a museum repository with permanent retrievable storage shall occur for paleontological resources.			
IMPLEMENTATION AND VERIFICATION:			
1) Submit evidence that specimens will be stored for paleontological resources to the Planning Division.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) During the construction phase.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:			
CULTURAL RESOURCES 5.9-2d A report of findings shall be prepared with an appended itemized inventory of specimens. The report shall include pertinent discussion of the significance of all recovered resources where appropriate. The report and inventory when submitted to the appropriate Lead Agency shall signify completion of the program to mitigate impacts to paleontologic resources.			
IMPLEMENTATION AND VERIFICATION:			
1) Submit the report of finding to the Planning Division for review.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) During the construction phase.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
GEOLOGY AND SOILS 5.10-1 The stability of south facing cut slopes shall be analyzed as part of the design-level geotechnical investigation. Utilizing 2:1 buttressed slopes using on site native soil materials, or constructing geotextile-reinforced soil buttresses for planned unstable cut slopes are typical engineering designs for stabilizing slopes. Either of these methods, or other methods must be approved by the San Bernardino County Department of Building and Safety.
IMPLEMENTATION AND VERIFICATION:
1) The design-level geotechnical investigation shall be submitted to the County Geologist for review/approval. 2) The Building Safety Division (i.e., County Geologist) shall verify compliance with the design-level geotechnical investigation.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to recordation of the tract map. 2) During the grading/construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
GEOLOGY AND SOILS 5.10-2a Due to the potential for erosion associated with younger alluvial deposits within the two major on-site stream channels, increased surface drainage quantities associated with development on-site shall be directed away from the stream channels.			
IMPLEMENTATION AND VERIFICATION:			
1) Demonstrate in the SWWP that surface drainage shall be directed away from stream channels. 2) The Department of Public Works shall verify compliance during site inspections.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to issuance of grading permits. 2) During the construction phase. 3) During the construction phase.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
GEOLOGY AND SOILS 5.10-2b Prior to the issuance of Grading Permits, the Project Applicant shall prepare a Soil Erosion and Sedimentation Plan for submittal and approval by the County Building and Safety Department.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit a copy of the Soil Erosion and Sedimentation Plan to the Building and Safety Division. 2) The Building and Safety Division shall review/approve the Soil Erosion and Sedimentation Plan prior to issuance of grading permits.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the issuance of Grading Permits. 2) During the grading/construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
GEOLOGY AND SOILS 5.10-3 Engineering design for all structures and roadways shall be based on the current California Uniform Building Code at the time of project development. Construction plans shall be in accordance with seismic design standards set forth by the County's Development Code and Uniform Building Code.
IMPLEMENTATION AND VERIFICATION:
1) Applicant shall submit a copy of the construction plans to the Building and Safety Department for review and approval. 2) The Building and Safety Department shall verify compliance with the construction plans during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the issuance of Grading Permits. 2) During the grading/construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:			
GEOLOGY AND SOILS 5.10-4 Residential structures shall be located in areas which provide a minimum of five feet of freeboard above the high water line for any structures.			
IMPLEMENTATION AND VERIFICATION:			
1) Applicant shall submit a copy of the construction plans to the Building and Safety Department for review and approval. 2) The Building and Safety Department shall verify compliance with the construction plans during site inspections.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to the issuance of grading permits. 2) Prior to grading/construction phase.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:			
GEOLOGY AND SOILS 5.10-5 Prior to grading permit issuance, a quantitative geotechnical analysis and design-level geotechnical engineering report shall be required and submitted to the County of San Bernardino Department of Building and Safety for their approval.			
IMPLEMENTATION AND VERIFICATION:			
1) The applicant shall submit a quantitative geotechnical analysis and design-level geotechnical investigation to the County Geologist for review and approval. 2) The Building and Safety Division (County Geologist) shall verify compliance with the approved geotechnical analysis and design-level geotechnical investigation.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to recordation of the tract map. 2) During grading/construction phase.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:
GEOLOGY AND SOILS 5.11-1 The proposed cross culverts shall be sized for 100-year burn and bulking flow rates. The burn and bulking method would increase the runoff from the natural areas. The method provided in the Los Angeles County Hydrology Manual is recommended. In addition, the cross culverts shall all be designed with headwalls to prevent CMP crushing, and shall be maintained adequately.
IMPLEMENTATION AND VERIFICATION:
1) Applicant shall submit evidence to the Department of Public Works and the Building and Safety Division that proposed cross culverts shall be sized for 100-year flow rates. 2) The Department of Public Works and the Building and Safety Division shall verify compliance during site inspections.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to issuance of grading permits. 2) During the grading/construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
GEOLOGY AND SOILS 5.11-2a Within three months of project approval, the Project Applicant shall submit a plan for a detailed geohydrologic investigation. The plan must present the possible sources of groundwater selected for the project and the methodology proposed to investigate those sources. If the on-site wells are to be utilized to serve this project, it must be determined if either could draw water from Big Bear Lake. The plan must be prepared by a California Registered Geologist.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall submit a plan for a detailed geohydrologic investigation to the County Geologist, and to the Division of Environmental Health Services. 2) The Building and Safety Division (County Geologist) and the Division of Environmental Health Services shall verify compliance with recommendations of the investigation.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Within three months of project approval. 2) Prior to issuance of building permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
GEOLOGY AND SOILS 5.11-2b Within six months of plan approval, the Project Applicant shall submit the results of the geohydrologic investigation. The report must be prepared by a California Registered Geologist.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall, within six months of project approval, submit results of the geohydrologic investigation prepared by a California Registered Geologist to the Building and Safety Division (County Geologist) for review/approval. 2) The Building and Safety Division (County Geologist) shall verify compliance with recommendations.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Within six months of plan approval. 2) During the grading/construction phase.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:
GEOLOGY AND SOILS 5.11-2c Concurrently or within three months of approval by the geohydrologic report, the Project Applicant shall submit a groundwater monitoring plan in accordance with San Bernardino County's "Guidelines for Preparation of a Groundwater Monitoring Plan." The plan must be prepared by a California Registered Geologist.
IMPLEMENTATION AND VERIFICATION:
1) The applicant shall, concurrently or within three months of approval of the hydrogeologic report, submit a groundwater monitoring plan prepared by a California Registered Geologist, to the County Geologist and the Division of Environmental Health Services for review/approval. 2) The County Building and Safety Division (County Geologist) and the Division of Environmental Health Services shall verify compliance with the approved Groundwater Monitoring Plan.
COMPLIANCE RECORD:

WHEN REQUIRED:	1) Concurrently or within three months of approval by the geohydrologic report. 2) Prior to issuance of the first residential building permit.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

MITIGATION MEASURE:	
GEOLOGY AND SOILS	
5.11-3	Prior to Grading Permit issuance and as part of the Project's compliance with the NPDES requirements, a Notice of Intent (NOI) shall be prepared and submitted to the Santa Ana Regional Water Quality Control Board providing notification and intent to comply with the State of California general permit. Also, a Storm Water Pollution Prevention Plan (SWPPP) shall be completed for the construction activities on-site. A copy of the SWPPP shall be available and implemented at the construction-site at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction-site to the "maximum extent practicable." At a minimum, the following shall be implemented from the *California Storm Water Best Management Practice Handbook - Construction Activity*: ▪ CA 1 Dewatering Operations – This operation requires the use of sediment controls to prevent or reduce the discharge of pollutants to storm water from dewatering operations. ▪ CA 2 Paving Operations – Prevent or reduce the runoff of pollutants from paving operations by proper storage of materials, protecting storm drain facilities during construction, and training employees. ▪ CA 3 Structural Construction and Painting – Keep site and area clean and orderly, use erosion control, use proper storage facilities, use safe products and train employees to prevent and reduce pollutant discharge to storm water facilities from construction and painting. ▪ CA 10 Material Delivery and Storage – Minimize the storage of hazardous materials on-site. If stored on-site, keep in designated areas, install secondary containment, conduct regular inspections and train employees. ▪ CA 11 Material Use – Prevent and reduce the discharge of pesticides, herbicides, fertilizers, detergents, plaster, petroleum products and other hazardous materials from entering the storm water. ▪ CA 20 Solid Waste Management - This BMP describes the requirements to properly design and maintain trash storage areas. The primary design feature requires the storage of trash in covered areas. ▪ CA 21 Hazardous Waste Management - This BMP describes the requirements to properly design and maintain waste areas. ▪ CA 23 Concrete Waste Management – Prevent and reduce pollutant discharge to storm water from concrete waste by performing on and off-site washouts in designated areas and training employees and consultants. ▪ CA 24 Sanitary Septic Water Management – Provide convenient, well-maintained facilities, and arrange regular service and disposal of sanitary waste. ▪ CA 30 Vehicle and Equipment Cleaning – Use off-site facilities or wash in designated areas to reduce pollutant discharge into the storm drain facilities. ▪ CA 31 Vehicle and Equipment Fueling – Use off-site facilities or designated areas with enclosures or coverings to reduce pollutant discharge into the storm drain facilities. ▪ CA 32 Vehicle and Equipment Maintenance – Use off-site facilities or designated areas with enclosing or coverings to reduce pollutant discharge into the storm drain facilities. In addition, run a "dry site" to prevent pollution discharge into storm drains. ▪ CA 40 Employee and Subcontractor Training – Have a training session for employees and subcontractors to understand the need for implementation and usage of BMPs. ▪ ESC 2 Preservation of Existing Vegetation – Minimize the removal of existing trees and shrubs since they serve as erosion control. ▪ ESC 10 Seeding and Planting – Provide soil stability by planting and seeding grasses, trees, shrubs, vines, and ground cover. ▪ ESC 11 Mulching – Stabilize cleared or freshly seeded areas with mulch. ▪ ESC 20 Geotextiles and Mats – Natural or synthetics material can be used for soil stability. ▪ ESC Dust Control – Reduce wind erosion and dust generated by construction activities by using dust control measures. ▪ ESC 23 Construction Road Stabilization – All on-site vehicle transport routes shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust. ▪ ESC 24 – Stabilized Construction Entrance – Stabilize the entrance pad to the construction area to reduce amount of sediment tracked off-site.

- ESC 30 Earth Dikes – Construct earth dikes of compacted soil to divert runoff or channel water to a desired location.
- ESC 31 Temporary Drains and Swales – Use temporary drains and swales to divert off-site runoff around the construction-site and stabilized areas and to direct it into sediment basins or traps.
- ESC 40 Outlet Protection – Use rock or grouted rock at outlet pipes to prevent scouring of soil caused by high velocities.
- ESC 41 Check Dams – Use check dams to reduce velocities of concentrated flows, thereby reducing erosion and promoting sedimentation behind the dams. Check dams are small and placed across swales and drainage ditches.
- ESC 50 Silt Fence – Composed of filter fabric, these are entrenched, attached to support poles, and sometimes backed by wire fence support. Silt fences promote sedimentation behind the fence of sediment-laden water.
- ESC 51 Straw Bale Barrier – Place straw bales end to end in a level contour in a shallow trench and stake them in place. The bales detain runoff and promote sedimentation.
- ESC 52 Sand Bag Barriers – By stacking sand bags on a level contour, a barrier is created to detain sediment-laden water. The barrier promotes sedimentation.
- ESC 53 Brush or Rock Filter – Made of 0.75 to 3-inch diameter rocks placed on a level contour or composed of brush wrapped in filter cloth and staked to the toe of the slope provides a sediment trap.
- ESC 54 Storm Drain Inlet Protection – Devices that remove sediment from sediment laden storm water before entering the storm drain inlet or catch basin.
- ESC 55 Sediment Trap – A sediment trap is a small, excavated, or bermed area where runoff for small drainage areas can pass through allowing sediment to settle out.

IMPLEMENTATION AND VERIFICATION:

1) The applicant shall submit a copy of the Notice of Intent and SWPPP to the Santa Ana Regional Water Quality Control Board for review and approval and a copy of the approved Notice of Intent and SWPPP to the County Building and Safety Division.
2) The Santa Ana Regional Water Quality Control Board and the County Building and Safety Division shall verify compliance with the Notice of Intent and SWPPP.

COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to grading permit issuance. 2) Prior to grading permit issuance.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	DATE:

MITIGATION MEASURE:

GEOLOGY AND SOILS

5.11-4a Prior to Grading Permit issuance, a Water Quality Management Plan shall be developed and shall include both Non-Structural and Source Control BMPs. The WQMP shall conform to the San Bernardino County Draft NPDES permit and WQMP standards. The following are the minimum required controls to be implemented as a part of the *Water Quality Management Plan (WQMP) for Urban Runoff*.

- Education for Property Owners, Tenants and Occupations – The Property Owners Association is required to provide awareness educational material, including information provided by San Bernardino County. The materials shall include a description of chemicals that should be limited to the property and proper disposal, including prohibition of hosing waste directly to gutters, catch basins, storm drains or the lake.
- Activity Restrictions – The developer shall prepare conditions, covenants and restriction of the protection of surface water quality.
- Common Area Landscape Management – For the common landscape areas on-going maintenance shall occur consistent with County Administrative Design Guidelines or city equivalent, plus fertilizer and pesticide usage consistent with the instructions contained on product labels and with regulation administered by the State Department of Pesticide Regulation or county equivalent.
- Common Area Catch Basin Inspection – Property Owners Associations shall have privately owned catch basins cleaned and maintained, as needed. These are intended to prevent sediment, garden waste, trash and other pollutants from entering the public streets and storm drain systems.
- Common Area Litter Control – POAs shall be required to implement trash management and litter control procedures to minimize pollution to drainage waters.
- Street Sweeping Private Streets and Parking Lots – Streets and Parking lots shall be swept as needed, to prevent sediment, garden waste, trash and other pollutants from entering public streets and storm drain systems.

The following controls from the *California Storm Water Best Management Practice Handbook - Municipal* shall be employed:

- SC10 Housekeeping Practices – This entails practices such as cleaning up spills, proper disposal of certain substances and wise application of chemicals.
- SC32 Used Oil Recycling – May apply to maintenance and security vehicles.
- SC72 Vegetation Controls – Vegetation control typically includes chemical (herbicide) application and mechanical methods. Chemical methods are discussed in SC10. Mechanical methods include leaving existing vegetation, cutting less frequently, hand cutting, planting low maintenance vegetation, collecting and properly disposing of clippings and cuttings, and educating employees and the public.
- SC73 Storm Drain Flushing – Although general storm drain gradients are sufficiently steep for self-cleansing, visual inspection may reveal a buildup of sediment and other pollutants at the inlets or outlets, in which case flushing may be advisable.

IMPLEMENTATION AND VERIFICATION:

1) The applicant shall submit a Water Quality Management Plan to the County Building and Safety Division to review compliance with the County NPDES.
2) The County Building and Safety Division shall verify compliance with the Water Quality Management Plan.

COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the issuance of a grading permit. 2) Prior to the issuance of a grading permit.

SUBMITTED:	DATE SUBMITTED:
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	DATE:	INSPECTED BY:	DATE:

CORRECTION REQUIRED: (attach copies of correspondence)	DATE:

MITIGATION MEASURE:

GEOLOGY AND SOILS

5.11-4b The Water Quality Management Plan (WQMP) shall include Structural or Treatment BMPs. The structural BMPs utilized shall focus on meeting potential TMDL requirements for noxious aquatic plants, nutrients, sedimentation and siltation. The structural BMPs shall conform to the San Bernardino County NPDES permit and the San Bernardino WQMP standards.

Consistent with the WQMP guidelines contained in the Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for San Bernardino County, Structural BMPs shall be required for the proposed Project. They shall be sized to comply with one of the following numeric sizing criteria or be considered by the permittees to provide equivalent or better treatment.

Volume Based BMPs shall be designed to infiltrate or treat either:

- The volume of runoff produced from the 85th percentile 24-hour storm event, as determined from the local historical rainfall record; or
- The volume of the annual runoff produced by the 85th percentile 24-hours rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or
- The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practice Handbook – Industrial/Commercial (1993); or
- The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event.

OR

Flow – based BMPs shall be designed to infiltrate or treat either:

- The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or
- The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or
- The maximum flow rate of runoff, as determined from the local historical rainfall record that achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

The following are the minimum required controls to be implemented as a part of the *Water Quality Management Plan (WQMP) for Urban Runoff*.

- Control of Impervious Runoff – Surface runoff shall be directed to landscaped areas or pervious areas.
- Common Area Efficient Irrigation – Physical implementation of the landscape plan consistent with County Administrative Design Guidelines or city equivalent, which may include provision of water sensors, programmable irrigation timers, etc.
- Common Area Runoff-Minimizing Landscape Design – Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration.
- Catch Basin Stenciling – "No Dumping – Flows to Lake" or equivalent effective phrase shall be stenciled on catch basins to alert the public as to the destination of pollutant discharging into storm drain.
- Debris Posts – These shall be installed to prevent large floatable debris from entering the storm drains. They shall be placed upstream of the cross culverts.
- Inlet Trash Racks – These shall be installed where appropriate to reduce intake and transport through the storm drain system of large floatable debris. Trash racks shall be provided where drainage from open areas enters storm drain or cross culverts.

IMPLEMENTATION AND VERIFICATION:			
1) The applicant shall submit a Water Quality Management Plan to the County Building and Safety Division to review compliance with the County NPDES, TMDLs and other WQMP standards. 2) The County Building and Safety Division shall verify compliance with the Water Quality Management Plan.			
COMPLIANCE RECORD:			
WHEN REQUIRED:	1) Prior to the issuance of a grading permit. 2) Prior to the issuance of a grading permit.		
SUBMITTED:		**DATE SUBMITTED:**	
1.		1.	
2.		2.	
APPROVED BY:		**DATE APPROVED:**	
INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**
CORRECTION REQUIRED: (attach copies of correspondence)			**DATE:**

MITIGATION MEASURE:

GEOLOGY AND SOILS

5.11-4c Storm water treatment under the NPDES Permit and the future TMDL requirements shall include the construction of treatment BMPs. Treatment BMPs appropriate for on-site use shall include infiltration trenches and basins, swales, inlet filtration, and/or water quality basins. All storm water runoff shall be treated before leaving the site to reduce pollutants in Big Bear Lake.

Infiltration Trenches and Basins

Infiltration Trenches and/or Basins shall be used on site to meet potential future TMDLs for noxious aquatic plants and nutrients. Infiltration trenches and basins treat storm water runoff through filtration. A typical infiltration trench is essentially an excavated trench that is lined with filter fabric and backfilled with stones. Depth of the infiltration trench shall range from three to eight feet and shall be located in areas with permeable soils, and water table and bedrock depth situated well below the bottom of the trench. Trenches shall not be used to trap coarse sediments since large sediment would likely clog the trench. Grass buffers may be installed to capture sediment before it enters the trench to minimize clogging. Infiltration basins shall be used for drainage areas between five and 50 acres. Infiltration basins shall be either in-line or off-line, and may treat different volumes such as the water quality volume or the 2-year or 10-year storm.

Swales

The project shall implement either vegetative swales, enhanced vegetated swales utilizing check dams and wide depressions, a series of small detention facilities designed similarly to a dry detention basin, or a combination of these treatment methods into a treatment train (series of Structural BMPs). The Water Quality Management Plan shall address treatment for the Project to assure that runoff from the site is treated to the "maximum extent practicable".

The swales shall be treated as water quality features and shall be maintained differently than grass areas. Specifically, pesticides, herbicide, and fertilizers, which may be used on the grass areas, shall not be used in the vegetation swales.

Filtration

Filtration shall be implemented as a treatment method and shall use drop-in infiltration devices or inline devices. Drop-infiltration devices at all curb inlets within the internal parking lots shall be implemented to provide potential pollutant removal. Existing examples of these filtration devices include the Drain Pac Storm Drain Inserts and Fossil Filters. These types of devices are efficient at removing oil and grease, debris, and suspended solids from treated waters. Some of these devices have also exhibited high efficiencies at removing heavy metals and other pollutants.

Inline devices suggested for use onsite include the Continuous Deflection Separator (CDS® unit). Once the runoff has entered the storm drain, an in-line diversion would direct the treatment flow to a CDS® unit. The CDS® unit is a non-blocking, non-mechanical screening system, which would provide a second line of defense for solids removal. Adsorption materials can be added within the CDS® unit to aid in the removal of oil and grease. The treated flow will exit the CDS® unit and continue downstream.

To assure the efficiency of these filtration devices, monitoring shall be conducted. The use of street sweeps on the parking lots and streets shall aid in reducing the amounts of sediment and debris that flow through the devices. This will extend the effectiveness of the devices during a storm and will lower the frequency of required maintenance. The devices shall be checked and cleaned, if necessary, once a month during the rainy season, following any precipitation and at the end of the dry season prior to the first precipitation event of the rainy season.

	Consideration shall be given to using these filtration units in other areas besides the parking lot inlets. Another potential location is at the downstream end of the tributary pipes that feed the discharge point. Siting these units at a downstream point would allow for the treatment of a greater amount of runoff.

IMPLEMENTATION AND VERIFICATION:

1) The applicant shall submit a copy of the Stormwater treatment BMPs to the County Building and Safety Division for review.
2) The County Building and Safety Division shall review BMPs to verify compliance with NPDES and TMDL requirements.

COMPLIANCE RECORD:

WHEN REQUIRED:	1) Prior to the issuance of grading permits. 2) Prior to the issuance of grading permits.

SUBMITTED:	**DATE SUBMITTED:**
1.	1.
2.	2.
APPROVED BY:	**DATE APPROVED:**

INSPECTED BY:	**DATE:**	**INSPECTED BY:**	**DATE:**

CORRECTION REQUIRED: (attach copies of correspondence)	**DATE:**

14.0 Comments and Responses

14.0 COMMENTS AND RESPONSES

14.1 CEQA REQUIREMENTS

In accordance with Section 15088, 15089 and 15132 of the California Environmental Quality Act (CEQA) Guidelines, the County of San Bernardino has prepared the Environmental Impact Report (EIR) for the Moon Camp Tentative Tract #16136 Residential Subdivision Project (SCH #2002021105).

This Comments and Responses section combined with the Draft EIR, which was circulated from March 30, 2004 to May 13, 2004, make up the Final EIR. CEQA requires a 45-day public review period for a project of this nature. Although the public review period ended on May 13, 2004, the County did accept comment letters after this date, as late as July 2, 2004, to which responses will be provided. Any additional County recommendations or requirements during the certification process will make up the final components of this EIR.

The following is an excerpt from the CEQA Guidelines, Section 15132:

"The Final EIR shall consist of:

(a) The Draft EIR or a version of the draft.

(b) Comments and recommendations received on the Draft EIR either verbatim or in summary.

(c) A list of persons, organizations and public agencies commenting on the Draft EIR.

(d) The responses of the Lead Agency to significant environmental points raised in the review and consultation process.

(e) Any other information added by the Lead Agency."

This Comments and Responses section includes all of the above-required components and shall be attached to the revised Draft EIR to make up the Final EIR. Each comment letter is followed by the corresponding responses. A response is provided for each comment raising significant environmental issues, as received by the County during the Draft EIR review period. Added or modified text is double underlined (example) while deleted text is struck out (~~example~~).

14.2 LIST OF COMMENTORS: 45-DAY DRAFT EIR REVIEW

FEDERAL, STATE AND LOCAL GOVERNMENT AGENCIES

1. Wes Reeder, County of San Bernardino
2. Greg Holmes, Department of Toxic Substances Control
3. Leslie MacNair, California Department of Fish and Game
4. Dennis Castrillo, California Governor's Office of Emergency Services
5. Jeffrey M. Smith, Southern California Association of Governments
6. Allison L. Stewart, United States Department of Agriculture
7. Terry Roberts, California Governor's Office of Planning and Research: State Clearinghouse and Planning Unit

PRIVATE/SPECIAL INTEREST GROUPS

8. Rogelio A. Rawlins, The Gas Company
9. Janet Davidson, Friends of Fawnskin
10. Sandy Steers, Friends of Fawnskin
11. Kassie Siegel, Center for Biological Diversity
12. Thomas Brandau, Friends of Fawnskin
13. Sandy Steers, Friends of Fawnskin
14. Ervin Nichols, The Sierra Club
15. Phillip R. Goode, William H. Marquette, and John R. Varsik, Big Bear Solar Observatory
16. Dorothy Myers, San Bernardino Audubon Society

INDIVIDUALS

17. Betty Conroy
18. Peg Allen
19. Barbara J. Finlayson-Pitts, Ph.D. and James N. Pitts, Jr., Ph. D.,
20. Herbert V. Clotts
21. Robert R. Henrich
22. Donald L. Eads, M.D.
23. Mary Lu Drake
24. Christine Florio
25. Everett H. Greenberg
26. Robert S. Drake
27. Joseph and Barbara Francuz
28. Jane E. MacNett
29. James C. McGrew and Lola E. McGrew
30. Roman M. Silberfeld
31. William C. Hazewinkel
32. Robert R. Henrich
33. Lindi Holland
34. Anne Browning McIntosh, AICP
35. James C. McGrew
36. Ervin Nichols

37. Peter J. Tennyson
38. Nancy Walker
39. Joseph and Barbara Francuz
40. Martha Brown
41. Robin and Scott Eliason
42. Marla J. Henrich
43. Dr. Gerald and Natalie Marks
44. William Hazewinkel and Nancy Walker
45. Beverly Ornelas
46. Sandy Steers
47. R. Lee and Marilyn Whitney
48. Thomas and Kimberly Brickley
49. Roman Silberfeld
50. Peter J. and Mary Tennyson
51. Gary and Judith Schkade
52. Stephen Youngerman
53. Marc and Mildred Mandel

COMMENT NO. 1

INTEROFFICE MEMO

DATE April 15, 2004

PHONE (909) 387-4240
MAIL CODE 0181

FROM WES REEDER, County Geologist
Building and Safety Division

TO MATT SLOWIK, Senior Associate Planner
Advance Planning Division

SUBJECT COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT, MOONCAMP DEVELOPMENT PROJECT, FAWNSKIN

Comments were previously provided for the Administrative Draft Environmental Impact Report (Interoffice memorandum dated September 12, 2002) and the Screencheck Draft Environmental Impact Report (August 5, 2003). Many of those previous comments are still applicable to the Draft Environmental Impact Report (DEIR).

Generally, there are two areas of concern, which include groundwater and the need for geotechnical and geologic design-level investigations.

Groundwater

The DEIR concludes that impacts related to water are considered as significant and unavoidable. The mitigation listed in table 2.2 of the DEIR includes a requirement for a video inspection of the existing on-site water wells prior to issuance of building permits. However, it is unclear just what "impact" this is intended to mitigate. The way this issue is presented in the DEIR is inconsistent with my understanding of the nature of the anticipated impacts and inconsistent with our previous discussions. 1-1

The water issue includes several subissues that appear to have been lumped into one overall impact. These subissues are: 1-2

- Current lack of a designated water purveyor
- Overdraft of the underlying aquifer
- Possible connection of the on-site wells with the waters of Big Bear Lake
- Need for additional off-site wells and/or construction of a new water reservoir

As you are aware, release of the DEIR was delayed several months pending publication of the Focused Geohydrologic Evaluation by Geoscience Support Services, Inc. for the City of Big Bear Lake Department of Water and Power (DWP). The report, dated December 3, 2003 was intended to supercede a previous Geohydrologic Investigation conducted by Geoscience in July 2000. However, the DEIR spends much time discussing the older report. In addition, page 5.11-6 states that the western one-third of the site lies within the Grout Creek Hydrologic Subunit and references the 2000 Geoscience report. This is incorrect. The DEIR then continues to discuss groundwater conditions within the Grout Creek Hydrologic Unit, although no project-related wells are currently proposed there. 1-3

The conclusion of the recently released 2003 study is simple and clear. The entire Moon Camp site is located within Subunit A of the North Shore Hydrologic Subunit. Subunit A is estimated to have an average groundwater recharge of 29-acre feet per year. According to page 5.3-16 of the DEIR, the DWP has estimated an Average Daily Demand for project water at 41,400 gallons. This equates to approximately 46 acre-feet per year. Therefore, there is a net deficit of 12-acre feet (46-29=12). The DEIR misses this point altogether. 1-4

The DEIR is inconsistent with respect to the overdraft discussion. Page 5.11-20 states "*the proposed project may result in groundwater overdraft*". Page 5.11-23 states that the groundwater basin "*is in a state of overdraft*". Page 8-15 states that "*a potential groundwater overdraft condition would occur*" due to the project. To indicate that groundwater overdraft may occur, would occur and is occurring is inconsistent. 1-5

The possible connection between the on-site wells and the waters of Big Bear Lake was mentioned in both of the Geoscience reports and in the DEIR. However, it is not treated as a separate issue. It should be considered independent from the impact of groundwater overdraft in that it may be possible to mitigate this impact by relocating wells up slope and away from the lake. 1-6

Page 5.3-16 of the DEIR states that the project applicant "*would be required to deposit funds with the DWP for new well construction unless a proven source of supply is provided by the developer at locations satisfactory to DWP and not exceeding sub-basin safe yields*". However, it is unknown whether DWP will be the water purveyor. In addition, if new wells are considered as part of the project description (on or off site) their potential impacts should be included in the environmental analysis. 1-7

Page 5.3-17 of the DEIR indicates that the existing Cline Miller Reservoir is not capable of serving the project. Apparently, a new reservoir 300% to 400% larger would be required. In addition, a 12-inch transmission pipeline would be required to connect the project to the new reservoir. It is unclear why these are not considered part of the project description. 1-8

Geotechnical/Geologic Design Criteria

To date, only a geologic feasibility study has been submitted and approved through the Building and Safety Division. Design-level geologic and geotechnical investigations are required prior to recordation and prior to issuance of grading or building permits. The need for additional studies was indicated in the DEIR but placed as mitigation for expansive soils (see Section 5.10-5 on page 5.10-15 and elsewhere in the DEIR). The requirement for an engineering geology investigation and a liquefaction analysis has nothing to do with the potential for expansive soils. 1-9

The DEIR implies that specific design has been recommended and approved for this project. Section 5.10-1 on page 5.10-15 (and elsewhere) states "*south facing cut slopes **shall** utilize 2:1 buttressed slopes using on site native materials, or by constructing geotextile-reinforced soil buttresses where cut slopes are planned*". (Emphasis added.) The design and methods utilized for cut slope stability must be approved by Building and Safety. As stated, no design-specific reports have been submitted for technical review. The DEIR should simply state that there is a potential for instability of south facing cut slopes and that this instability can be mitigated through standard engineering design as recommended in the required geologic and geotechnical reports. 1-10

WR:ljg

cc: Randy Scott, Division Chief, Advance Planning Division

Response to Commentor No. 1
Wes Reeder, County of San Bernardino
April 15, 2004

1-1 The purpose of the video logs is to determine if any modifications to the existing non-operative wells are necessary prior to use. Analysis and Mitigation Measure 5.3-6a of the Draft EIR have been updated to reflect the nature of the video inspection logs and requirement for step-drawdown and constant rate pumping tests.

Page 5.3-16, Paragraph 5 of the Draft EIR has been revised in the Final EIR as follows:

> Potential Water Supply Wells FP-2 and FP-3. As stated above, the project site includes two existing on-site water wells located within the North Shore Hydrologic Subunit that could potentially supply water to the project. ~~The two wells referenced may have potential to meet the Moon Camp area demand requirements.~~ The wells, which were drilled in 1987, are located on the Moon Camp property and are not currently in operation. The most recent data available regarding the wells was collected in 1987 and is summarized in Table 5.3-2, *Summary of Data on Wells FP-2 and FP-3*.

Page 5.3-17, Paragraph 1 of the Draft EIR has been revised in the Final EIR as follows:

> Although the yields indicate that the wells show adequate potential to supply water to the project, the North Shore Hydrologic Subunit has been identified to likely be in a state of overdraft and more specifically, subarea A is estimated to have a recharge rate of approximately 29-acre feet per year, which is not enough to meet the 46 acre-feet per demand of the proposed project. ~~Although overdraft conditions have been noted for the groundwater basin, the yield of the wells (as tested in 1987), show adequate water supply potential. However, prior to use, video logs should be run on each well to examine the condition of the casing and screen. Based on review of the video logs, it can be determined if any modifications are necessary prior to use. Following the video inspection (and redevelopment if necessary), updated values of production rates and pumping levels should be obtained through step-drawdown and constant rate pumping tests. Water samples should also be taken during testing and analyzed in accordance with standard requirements for a potable water supply.~~

Page 5.3-23, Mitigation Measure 5.3-6a of the Draft EIR has been revised in the Final EIR as follows:

5.3-6a	~~Prior to approval of building permits, a video inspection of water supply casings and screen shall be conducted in order to update~~ Values of production rates and pumping levels for on-site water supply wells shall be obtained through step-drawdown and constant rate pumping tests. Water samples shall be taken during the inspection for testing and analysis in accordance with standard requirements.

1-2 The sub-issues identified by the Commentor are addressed in Section 5.3, *Public Services and Utilities*, and Section 5.11, *Hydrology and Drainage*. Also, refer to Response to Comment Nos. 1-3 to 1-6.

1-3 Section 5.11, *Hydrology and Drainage*, of the Draft EIR has been revised to state the applicable use of data included within the 2000 and 2003 reports prepared by Geosciences (GSS). The GSS 2003 report includes current data on groundwater supplies in the North Shore and Grout Creek Hydrologic Subunits. The findings in the GSS 2003 report regarding groundwater supplies are assumed to supercede the GSS 2000 report findings. However, the data regarding groundwater quality and well operations in the GSS 2000 report are still applicable and cited in the Final EIR, where appropriate. The Final EIR text has been updated to cite that the project is located entirely within tributary subarea A of the North Shore Hydrologic Subunit. Although the project is located within subarea A of the North Shore Hydrologic Subunit, groundwater conditions are also analyzed for the Grout Creek Hydrologic Subunit because water resources from this area could potentially be utilized as a water resource for the project. The EIR concludes that future studies and analysis will be required to provide proof of a proven water supply source for the project, regardless of whether the water resources come from the North Shore and/or Grout Creek Hydrologic Subunits or any other source.

Page 5.11-6, beginning with Paragraph 5 of the Draft EIR has been revised in the Final EIR as follows:

As stated above, ~~T~~the groundwater conditions cited in this EIR are based on two separate reports prepared by Geoscience Support Services, Inc. (GSS). The GSS 2000 report includes data on the groundwater quality, on-site well operations (Wells-FP-2 and FP-3) and groundwater supply potential. ~~in 2000 and a~~ The GSS 2003 report ~~Focused Geohydrologic Evaluation of the Maximum Perennial Yield for the North Shore and Grout Creek Hydrologic Subareas, prepared in 2003~~ includes current data on groundwater supplies in the North Shore and Grout Creek Hydrologic Subunits. The findings in the GSS 2003 report regarding groundwater supplies are assumed to supercede the 2000 findings. The GSS 2003 report presents a focused geohydrologic evaluation of the maximum perennial yield of the North Shore and Grout Creek Subunits that includes dividing each subunit into smaller tributary subareas. However, the data regarding groundwater quality and well operations in the GSS 2000 report are still applicable and cited in this section.

It is also noted that the wells analyzed in the GSS 2000 report are not included in the GSS 2003 report, as they are non-operational. Well FP-2 is located on the Moon Camp project site.

Although the project area is located entirely within tributary subarea A of the North Shore Hydrologic Subunit, potential groundwater resources are analyzed for both the North Shore and the Grout Creek Hydrologic Subunits as they are both considered potential sources to supply water to the project.

~~According to the 2000 report, the entire project site is within subunit A of the North Shore subarea of Big Bear Lake. The western one-third lies within the Grout Creek subarea. The North Shore subarea is similar in several respects to the Grout Creek subarea. For example, a considerable amount of the water bearing (older alluvial) material present is above the known groundwater surface. Only a band of these materials adjacent to Big Bear Lake are continuously saturated.~~

~~According to a recent geohydrologic investigation of the Moon Camp Area by Geoscience Support Services (GSS, 2000), the older alluvial deposits represent the main water-bearing formation beneath the site. Groundwater level data from two U.S. Forest Service wells located within the project area suggest that Big Bear Lake provides recharge to the aquifer beneath the project area. Additional groundwater recharge emanates from gravity drainage from the higher elevations north of the Moon Camp area.~~

~~Based on studies by GSS (2000), the main water-bearing zones within the older alluvial deposits consist of intermixed and interlayered sand and gravels. However, lithologic data from the two U.S. Forest Service wells indicate that these sand and gravel aquifers are not continuous over wide areas and tend to follow subsurface channels (GSS, 2000). In mid 2000, groundwater beneath the southern margin of the site was approximately 5 to 10 feet below the level in the lake. More recent groundwater level observations from the three exploratory borings drilled for the liquefaction analysis appears to be similar with respect to the level of the lake.~~

~~The results from GSS 2000 geohydrologic investigation indicate the recoverable amount of groundwater in the Moon Camp area is estimated at 230 acre-feet per year. Based on the nature of the aquifer materials, thickness of the aquifer and the discharge rate of existing wells in the Moon Camp area is estimated at 230 acre-feet per year. Based on the nature of the aquifer materials, thickness of the aquifer and the discharge rate of existing wells in the Moon Camp area, the potential to develop a 100 gallon per minute (gpm) water well supply is considered by GSS (2000) to be good. Chemical analyses of the groundwater from the two on-site water wells indicate that the groundwater is of superior quality. However, the iron concentration (0.69 mg/l) in one well exceeds the state maximum concentration limit for iron (0.3 mg/l) (GSS, 2000).~~

The following insert, to be added following Paragraph 3 on Page 5.11-8 of the Draft EIR, is included in the Final EIR:

NORTH SHORE HYDROLOGIC SUBUNIT

Groundwater in the North Shore Hydrologic Subunit generally occurs in the unconsolidated alluvial deposits on the lower slopes of the surrounding mountains and in the fractures and weathered portions of the bedrock. Groundwater in the alluvium occurs at depths ranging from approximately 5 feet (ft) in the western portions of the Subunit and near the RV Park wells to approximately 50 ft near Division Well Nos. 6 and 7 (refer to Figure 2 in the GSS 2003 report for well location in the North Shore and Grout Creek Subunits).

Groundwater flows by gravity drainage from areas of high elevation (the mountain slopes) into areas of low elevation, ultimately collecting in the sediments beneath Big Bear Lake. Groundwater recharge likely occurs as deep percolation of runoff through the younger alluvium and fractures in the bedrock during periods of prolonged precipitation.

The primary sources of groundwater discharge from the North Shore Subunit are underflow and groundwater pumping from wells within the Subunit. The DWP currently operates four vertical production wells within the North Shore Subunit (RV Park Well Nos. 1 and 2 and Division Well Nos. 6 and 7). Combined average annual groundwater production from DWP wells between 1993 and 2002 is 282 acre-feet per year acre-ft/yr. Pumping data for the 20 private wells in the Subunit were not available. However, assuming that they are domestic sources and that an average single family home uses approximately 200 gallons per day per year (gpd/yr), it is estimated that production from these wells is approximately 4.5 acre-ft/yr.

Groundwater levels in the central portion of the North Shore Hydrologic Subunit, as measured in RV Park Well No. 1, have declined approximately 20 feet between 1996 and 2002. The groundwater level in this well is relatively stable, however, with most of the decline occurring after year 2000, a period of relatively dry climatic conditions. Groundwater levels in Division Well No. 6, located in the eastern portion of the Subunit, have declined approximately 80 ft between 1992 and 2003. Recent groundwater level declines in the eastern portion of the Subunit can also be correlated with dry climatic conditions, although the greater degree of decline is also a reflection of higher groundwater production in the area.

Estimates of Average Annual Groundwater Recharge (North Shore Subunit)

Estimates of average annual groundwater recharge were assigned to each tributary subarea using the watershed model. Required input parameters for the watershed model for which no measured data were available were obtained from the EPA database of hydrologic parameters. Based on the watershed modeling results, the estimates of average annual groundwater recharge for the North Shore Hydrologic Subunit range from approximately 150 to 430 acre-ft/yr with a midpoint of approximately 290 acre-ft/yr. This range of recharge is approximately 2 to 7 percent of average annual precipitation for the Subunit, which is within the range of accepted recharge estimates for other groundwater basins in southern California (3 to 7 percent) determined by the Metropolitan Water District of Southern

California (MWD). The midpoint of the range is approximately 4.5 percent of precipitation for the Subunit.

Estimates of average annual groundwater recharge for the six tributary subareas range from 27 acre-ft/yr (subarea E) to 73 acre-ft/yr (subarea B) (refer to Table 5.11-3, *Summary of Groundwater Recharge Results North Shore Tributary Subareas*). These groundwater recharge estimates represent the average of the watershed model output range, which is based on the average of typical and possible input values. The data suggests that the RV Park wells are producing groundwater at a rate (approximately 14 acre-ft/yr), which is well within their subarea's (subarea B) average annual groundwater recharge. Combined average annual groundwater production from Division Well Nos. 6 and 7 is exceeding that subarea's (subarea F) average annual groundwater recharge. However, it is important to note that these wells are in the alluvial portion of the subarea, which is in hydraulic continuity with the alluvial portions of the adjacent hydrologic subunit (i.e. the Division Subunit to the south). Accordingly, production from these wells should be evaluated in the context of the groundwater basin in this area and not the watershed tributary to the wells.

Maximum Perennial Yield (North Shore Subunit)

According to the GSS 2003 report, the midpoint of the estimated range of average annual groundwater recharge (approximately 290 acre-feet per year) is considered a good estimate of maximum perennial yield for the North Shore Hydrologic Subunit, given the available data.

The following insert, to be added below Table 5.11-3 on Page 5.11-8 of the Draft EIR, is included in the Final EIR:

GROUT CREEK HYDROLOGIC SUBUNIT

Groundwater within the Grout Creek Subunit occurs in both the bedrock and alluvium. The Cedar Dell slant wells (located in subarea C) are drilled into the Mesozoic granitic rock and typically produce approximately 20 gallons per minute, collectively. Groundwater in the alluvium occurs at depths ranging from approximately 20 to 90 ft and flows to the south toward Grout Bay (Big Bear Lake) at a gradient of 0.024 to 0.043 ft/ft. Pumping test and lithologic data from the Barbara Lee Lane Well and specific capacity data from Wells 12P01, 13C01, and Northshore Well Nos. 1, 2, and 3 were used to estimate aquifer transmissivity. Estimates range from 700 to 1,900 gpd/ft.

Groundwater recharge likely occurs within the Grout Creek streambed during periods of extended runoff, near the contact between the bedrock and alluvium and, to a lesser extent, as percolation of precipitation directly on the alluvium. Groundwater recharge also occurs through fractures in the bedrock formations.

The primary sources of groundwater discharge from the Grout Creek Subunit are underflow and groundwater pumping from wells within the Subunit. DWP currently

operates two vertical production wells, two slant wells in bedrock, and one spring within the Grout Creek Subunit. Average annual groundwater production from DWP wells within the Subunit from 1989 to 2002 has been approximately 134 acre-ft/yr. With the exception of pumping from Barbara Lee Lane Well No. 1, all of the municipal groundwater production in the Grout Creek Hydrologic Subunit is from tributary subarea C. Pumping data for the 29 private wells in the Subunit were not available. However, assuming that they are domestic sources and that an average single family home uses about 200 gpd/yr, it is estimated that production from these wells is approximately 6.5 acre-ft/yr.

Estimates of Average Annual Groundwater Recharge (Grout Creek Subunit)

Groundwater level elevations in North Shore Well Nos. 1 and 3, both located at the discharge end of tributary subarea C, have been relatively stable between 1995 and 2003, with seasonal fluctuations and a minor decline during the relatively dry climatic cycle from 1999 to December 2003. The average annual groundwater recharge of the Grout Creek Subunit was estimated using the underflow method and the watershed model.

The underflow method indicated an average annual groundwater recharge estimate of approximately 200 acre-ft/yr. It should be noted, however, that the underflow calculation only accounts for outflow in the alluvial aquifer and does not account for outflow through the bedrock in the Subunit. It is assumed that some outflow occurs within the bedrock aquifer, which is one reason why the underflow estimate for the Grout Creek Subunit is lower than the perennial yield estimate from the watershed model (described below).

Based on the watershed modeling results, the average annual groundwater recharge for the Grout Creek Hydrologic Subunit (subareas A through D) is estimated to range from approximately 260 to 840 acre-ft/yr with a midpoint of approximately 550 acre-ft/yr (refer to Table 5.11-4, *Summary of Groundwater Recharge Results Grout Creek Tributary Subareas*). This range of recharge is approximately 2 to 8 percent of average annual precipitation for the Subunit. The midpoint of the range is approximately 5 percent of precipitation for the Subunit. Assumed input parameters for the watershed model are based on the average of EPA' s suggested parameter ranges.

The relative disparity between the average annual recharge estimates obtained from the underflow analysis and watershed model is partly due to the estimated nature of the input parameters used in each analysis. In the case of the underflow analysis, the transmissivity parameter is estimated based on review of lithologic logs and pumping tests in wells within the Big Bear area that are perforated in similar aquifer materials. More representative values can be obtained via formal aquifer pumping tests using the wells in the Subunit. For the watershed model, 18 of the 20 required input parameters are estimated from the EPA' s database, which is not specific to the mountains of Southern California. Additionally, the underflow analysis does not account for all of the recharge within the bedrock. As data is collected in the future, the range of recharge will become less.

Estimates of average annual groundwater recharge for the four tributary subareas range from 66 acre-ft/yr (subarea D) to 217 acre-ft/yr (subarea C). These average annual recharge values represent the average of the watershed model output range, which is based on the average of typical and possible input values. These data suggest that average annual groundwater production from the Grout Creek Hydrologic Subunit (approximately 134 acre-ft/yr), which occurs almost entirely from tributary subarea C, is within the average annual recharge for both the tributary subarea and the hydrologic subunit.

Maximum Perennial Yield (Grout Creek Subunit)

The maximum perennial yield of the Grout Creek Hydrologic Subunit is within the range of average annual groundwater recharge specified by the watershed model, but is more likely to be in the lower end of the range than the upper end. As mentioned previously, by definition, maximum perennial yield is the amount of water that can be developed economically, legally and politically. In consideration of this, subareas A and B of the Grout Creek Subunit are remote and are located on land under the jurisdiction of the United States Forest Service (USFS). There is no established distribution system in subareas A and B of the Grout Creek Subunit. Furthermore, access to the area would likely require a lengthy negotiation process with the USFS. Given these factors, developing groundwater resources in these subareas is not currently practical.

At this time, it is recommended to use the sum of the midpoint recharge estimates for tributary subareas C and D (217 acre-ft plus 66 acre-ft; see Table 5.11-4) as the maximum perennial yield for the Grout Creek Subunit (total of 283 acre-ft/yr). It should be emphasized that as groundwater production is initiated in each subarea, it will be very important to monitor groundwater levels in dedicated non-pumping monitoring wells (i.e., "key wells") located in each tributary subarea from which groundwater is extracted. As was recommended for the North Shore Hydrologic Subunit, future management of the groundwater resources in each tributary subarea should rely more on established groundwater level thresholds than the perennial yield estimates.

The results of the groundwater recharge analysis for the Grout Creek Subunit are as follows:

Table 5.11-4
Summary of Ground Water Recharge Results
Grout Creek Tributary Subareas

Tributary Subarea	Area (acres)	Annual Precipitation	Average Annual Ground Water	Average Annual Ground Water	Average of Ground Water
A	1,074	33.44	74	249	161
B	850	29.01	50	160	105
C	1,668	29.93	104	331	217

D	592	26.74	32	99	66
Total (A to D)	4,184	119	260	839	549
Total (C and D only)	2,260	56.67	136	430	283

Tributary subareas A and B are excluded from the totals because they are not currently practicable to developed due to their remote locations and are located on land under the jurisdiction of the U.S. Forest Service.

1-4 Section 5.11, *Hydrology and Drainage*, of the Draft EIR has been revised to compare the water demand generated by the proposed project and the recharge rate of tributary subarea A of the North Shore Hydrologic Subunit in which the project area is located. According to the 2003 GSS report, the groundwater recharge rate of the subarea A is approximately 29-acre feet per year and the anticipated water demand for the proposed project is approximately 46 acre-feet per year. Thus, the Commentor is correct in their evaluation that there is a net deficit of 17-acre feet per year (46-29=17) in tributary subarea A in regards to the anticipated water demand of the project.

Page 5.11-23, Paragraph 2 of the Draft EIR has been revised in the Final EIR as follows:

As stated in Section 5.3, *Public Services and Utilities*, the project would require approximately 46 acre-feet per year of water to meet the average daily water demand for the proposed residential uses. If water was obtained from existing well(s) (FP-2 and/or FP-3), which are located in subarea A of the North Creek Hydrologic Subunit, subarea A alone would not have the requisite water resources to meet the ADD over the course of a one-year period, as it only averages approximately 29 ac-ft/yr of groundwater recharge. Thus, it can be concluded that additional water resources beyond what is available from on-site wells or wells located within subarea A of the North Shore Hydrologic Subunit would need to be obtained to meet the water demands of the project.

~~Regarding the two existing wells located within the Moon Camp Project site, no mention was given in the latest GSS report as to the potential hydrologic interconnection of the groundwater aquifer with Big Bear Lake. Given the proximity of these wells to the lake, it appears highly probably that the water extracted from one or both of these wells could include some component of lake water.~~

Based upon the conclusions rendered by GSS and subsequent peer review, additional review is necessary to conclude hydrologic subunit effects. Although mitigation measures requiring further testing are referenced, based upon the evidence presented to date, it is concluded that impacts to groundwater resources are~~overdraft is~~ a significant adverse effect and until additional technical review is conducted to verify conditions, the Project would result in an unavoidable impact.

1-5 Section 5.11, *Hydrology and Drainage*, of the Draft EIR has been revised to state that based upon the information/studies available as of the publication of the Draft EIR, there is the potential that the groundwater basin is in a state of overdraft. This conclusion is based upon the available data from the 2003 GSS report and the necessity to conduct additional studies to determine the state of groundwater conditions in the North Shore and Grout Creek Hydrologic Subunits.

Page 5.11-23, the first bullet point of the Draft EIR has been revised in the Final EIR as follows:

> It is stated that the reason for the recent groundwater level declines in the eastern portion of North Shore can be correlated with dry climatic conditions although the greater degree of decline is also a reflection of higher groundwater production in the area. Based on Mr. Magorien's review of the data, the production rate from Division Well No. 6 (see report Table 4) is the much more correlatable with the drop in water levels. Based upon information/studies available as of the publication of the Draft EIR, there is the potential that~~It appears~~ the North Shore Subunit is in an overdraft situation given ~~their~~the analyzed pumping rates.

Page 5.11-23, Paragraph 1 of the Draft EIR has been revised in the Final EIR as follows:

> Based on the information presented in the 2003 GSS report, as well as the 2000 report, it is concluded by Mr. Magorien in the peer review that the groundwater basin associated with the North Shore Hydrologic Subunit in which the Moon Camp Project area is situated~~, is in~~ has the potential to be in a state of overdraft. Any additional groundwater withdrawals from this Subunit will only exacerbate this potential overdraft condition. Considerably more investigative studies involving exploratory drilling and aquifer testing to assess the actual nature of the groundwater regime in the vicinity of the Moon Camp Project are is warranted. Furthermore, although there appears to be groundwater resources available within the neighboring Grout Creek hydrologic unit, a more thorough hydrogeologic investigation is also warranted for this hydrologic unit before additional groundwater resources can be exploited for a project the size of Moon Camp.

Page 5.11-27, Mitigation Measure 5.11-2 of the Draft EIR has been revised in the Final EIR as follows:

> **GROUNDWATER**
>
> Refer to Mitigation Measures 5.3-6a and 5.3-6b for mitigation regarding operations and groundwater quality from existing on-site wells.
>
> ~~5.11-2 Based upon the technical analysis presented, a potential groundwater overdraft condition would occur and no additional mitigation measures~~

~~have been identified.~~

5.11-2a Within three months of project approval, the Project Applicant shall submit a plan for a detailed geohydrologic investigation. The plan must present the possible sources of groundwater selected for the project and the methodology proposed to investigate those sources. If the on-site wells are to be utilized to serve this project, it must be determined if either could draw water from Big Bear Lake. The plan must be prepared by a California Registered Geologist.

5.11-2b Within six months of plan approval, the Project Applicant shall submit the results of the geohydrologic investigation. The report must be prepared by a California Registered Geologist.

5.11-2c Concurrently or within three months of approval by the geohydrologic report, the Project Applicant shall submit a groundwater monitoring plan in accordance with San Bernardino County's "Guidelines for Preparation of a Groundwater Monitoring Plan." The plan must be prepared by a California Registered Geologist.

1-6 According to the GSS 2000 and 2003 reports, there exists a potential connection between groundwater levels of the on-site wells and water of Big Bear Lake.

The following paragraph, to be added below Paragraph 3 on Page 5.11-23 of the Draft EIR, will be included in the Final EIR:

Interference with Big Bear Lake Water Levels

Regarding the two existing wells located within the Moon Camp Project site, no mention was given in the latest 2003 GSS report as to the potential hydrologic interconnection of the groundwater aquifer with Big Bear Lake. The GGSS 2000 report states that the water level in the lake is approximately 5 to 10 feet higher than the water level elevation of Well FP-2, indicating that there is the potential for recharge from the lake. Thus, given the proximity of the existing on-site wells to the lake, it appears highly probable that the water extracted from one or both of these wells could include some component of lake water. It may be possible to mitigate this impact by relocating wells up slope and away from the lake. However, further study is necessary to determine the interconnection of lake water to the subareas of the North Shore and Grout Creek Subunits.

1-7 The Commentor is correct is his comments. Section 5.3, *Public Services and Utilities*, of the Draft EIR has been revised to clarify that the Big Bear Department of Water and Power (DWP) and/or the County Special District could be the water purveyor for the project and that funds would be deposited to the appropriate agency, as necessary.

Page 5.3-16, Paragraph 2 and the proceeding text of the Draft EIR has been revised in the Final EIR as follows:

Water Demand. The DWP has estimated the ADD for the Fawnskin area to be approximately ~~450~~ 250 gallons per day per EDU (gpd/EDU). [Note to Reviewer: The updated calculation is based upon further analysis by SO & Associates Engineers, dated September 7, 2004.] The letter report has been incorporated in to the EIR Appendix.] The MDD considers water usage over an 8 to 10-hour period each day. The Project's ADD and MDD are as follows:

Average daily demand (ADD) = 92 EDU x 250 gpd/EDU
= 25.77 AF/year

Maximum day demand (MDD) = 2.5 x ADD/1,440 minutes per day
= 57,500 gpd (about 40 gpm)

Assuming the ADD calculated above, the project would require approximately 25.77 acre-feet of water per year to supply the proposed residential uses.

Fire Flow Requirements. The existing water distribution system was originally designed for approximately 750-gpm fire flow for two hours. The current requirement per the County Fire Department for the Fawnskin area is between 1,000 gpm and 1,500 gpm depending on the building square footage. The fire flow may be further increased in the future. As such, the water distribution system was analyzed to handle the maximum day demand of the proposed development plus fire flow up to 1,500 gpm.

Water Supply and Storage Requirements. The State Health Department requires storage to account for one peak day usage. The DWP typically experiences one peak day during a summer holiday when tourists and part-time residents become full-time users. The coefficient of ~~450~~ 250 gpd/EDU and corresponding MDD is representative of that day and is the basis for calculating the water demand and storage requirement for the proposed Project as presented in prior discussions and outlined below:

Domestic Water Supply requirement (max day) = 40.0 gallons per minute

Operational Storage = (0.3 x MDD)	=	17,250 gallons
Emergency Storage = (1.0 x MDD)	=	57,500 gallons
Subtotal (without fire storage)	=	74,750 gallons

Fire Storage (1,500 gpm x 2 hours) = 180,000 gallons
Total Storage Requirement = 255,000 gallons

Based on proposed development requirements (at MDD), ~~two new wells would be required~~ the project would need to have a water supply that~~to~~ could provide a minimum of 72.0 gallons per minute. As discussed below and in Section 5.11, *Hydrology and Drainage*, two existing on-site wells could potentially supply a portion of the water demand to the project. The project site is located within tributary subarea A of the North Shore Hydrologic Subunit. The groundwater recharge for subarea A is estimated to be approximately 29 acre-feet per year. Since the project would require approximately 46 acre-feet per year, it is concluded that on-site wells alone could not supply the necessary water resources to support the proposed residential uses. If the on-site wells were utilized to supply a portion of the water supply to the project, ~~T~~the Project Applicant would be required to deposit funds with the DWP and/or BBCSD to equip the wells to meet the appropriate water agency's standards.~~for new well construction unless a proven source of supply is provided by the developer at locations satisfactory to DWP and not exceeding sub-basin safe yields.~~ As stated in Section 5.11, ~~Hydrology and Drainage, the testing of overdraft conditions for~~ the groundwater basin associated with the North Shore Hydrologic Subunit ~~is inconclusive~~has the potential to be in an overdraft situation, thus, it has been concluded that impacts to groundwater resources are significant and unavoidable. Therefore, additional studies and analysis will need to be provided by the Project Applicant to indicate a proven source of water supply for the project.

1-8 The modifications necessary to the water distribution system, including the Cline Miller Reservoir and associated piping, were identified as recommendations in the Water Feasibility Study (March 2002) to accommodate the necessary water storage and distribution requirements for the project. Although the Project Applicant would fund the identified improvements, any modifications to the water distribution system would be subject to approval by the appropriate water agency. The water agency would conduct any additional environmental review, as required by CEQA, for the identified water system improvements. These improvements to the water distribution system were incorporated into the EIR as mitigation measures.

1-9 The Commentor is correct in his comments. Currently, there is insufficient information concerning the expansive nature of the alluvial soils beneath the project site. This impact would need to be evaluated in design-level geotechnical analysis/studies, which include a quantitative geotechnical analysis and a design-level geotechnical engineering report. Implementation of the recommended mitigation measures from the design-level geotechnical engineering report would reduce potential impacts regarding expansive soils to less than significant levels.

Page 5.10-14, Paragraph 2 of the Draft EIR have been revised in the Final EIR as follows:

Currently, there is insufficient information concerning the expansive nature of the alluvial soils beneath the project site. This impact will need to be evaluated in ~~additional~~ design level geotechnical analysis/studies~~.~~, which include ~~1)~~ a quantitative geotechnical analysis~~,~~ ~~2), a design level geotechnical engineering report,~~ and ~~3)~~ a design-level engineering geology report. Implementation of the

recommended mitigation measures ~~of~~ from the design-level geotechnical engineering report ~~the recommended mitigation measure and conclusions rendered in the referenced reports~~ would reduce impacts to less than significant levels.

Page 5.10-15, Mitigation Measure 5.10-5 of the Draft EIR have been revised in the Final EIR as follows:

EXPANSIVE SOILS

5.10-5 Prior to grading permit issuance, ~~geologic analysis/studies shall be required including 1)~~ a quantitative geotechnical analysis and~~of liquefaction, 2) a~~ design-level geotechnical engineering report shall be required and submitted to the County of San Bernardino Department of Building and Safety for their approval. ~~and 3) a design level engineering geology report.~~

1-10 The Commentor is correct in his comments. Section 5.10, *Geology and Soils*, of the Draft EIR has been revised to state that the potential for instability of south facing cut slopes can be mitigated by standard engineering design as recommended in the geologic and geotechnical reports.

Page 5.10-15, Mitigation Measure 5.10-1 of the Draft EIR has been revised in the Final EIR as follows:

SLOPE STABILITY

5.10-1 The stability of ~~S~~south facing cut slopes shall be analyzed as part of the design-level geotechnical investigation. ~~u~~Utilize~~e~~ing 2:1 buttressed slopes using on site native soil materials, or ~~by~~ constructing geotextile-reinforced soil buttresses ~~where~~for planned unstable cut slopes ~~are planned~~ are typical engineering designs for stabilizing slopes. Either of these methods, or other methods must be approved by the San Bernardino County Department of Building and Safety~~Geologist for slope reinforcement may be utilized~~.

COMMENT NO. 2

Department of Toxic Substances Control

Terry Tamminen
Agency Secretary
Cal/EPA

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

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April 30, 2004

Mr. Matthew W. Slowik
Senior Associate Planner
Land Use Services, Planning Division
County of San Bernardino
385 North Arrowhead Avenue, First Floor
San Bernardino, California 92415-0182

NOTICE OF COMPLETION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE MOON CAMP RESIDENTIAL SUBDIVISION TT NO. 16136 PROJECT (SCH #2002021105)

Dear Mr. Slowik:

The Department of Toxic Substances Control (DTSC) has received your Notice of Completion (NOC) of a draft Environmental Impact Report (EIR) for the above-mentioned Project.

Based on the review of the document, DTSC's comments are as follows:

1) A copy of the NOC should be filed with the State Clearinghouse, 1400 Tenth Street, P.O. Box 3044, Sacramento, California 95812-3044, telephone number (916) 445-0613. 2-1

2) DTSC's comments dated March 11, 2002, regarding the Notice of Preparation of a draft EIR have not been properly addressed in the currently submitted draft EIR. If a DTSC comment in the aforementioned letter is not applicable to the project site, it should be stated in the draft EIR. 2-2

3) The Initial Study Environmental Checklist Form, Section VII, Hazards and Hazardous Materials, subsection (d) of the NOP states that the project site is not identified by the County of San Bernardino as a hazardous waste site (December 1, 1994). It also states that the County Fire Department HazMat Division responded to a Project Notice for Tentative Tract No. 16136 that "No hazardous materials conditions apply to this project" (July 24, 2001). The draft EIR needs to identify any known or potentially contaminated sites within the proposed Project area. For all identified sites, the draft EIR should evaluate 2-3

whether conditions at the site pose a threat to human health or the environment. A Phase I Assessment may be sufficient to identify these sites. Following are the databases of some of the regulatory agencies:

- National Priorities List (NPL): A list is maintained by the United States Environmental Protection Agency (U.S.EPA).
- CalSites: A Database primarily used by the California Department of Toxic Substances Control.
- Resource Conservation and Recovery Information System (RCRIS): A database of RCRA facilities that is maintained by U.S. EPA.
- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS): A database of CERCLA sites that is maintained by U.S.EPA. 2-3
- Solid Waste Information System (SWIS): A database provided by the California Integrated Waste Management Board which consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations.
- Leaking Underground Storage Tanks (LUST) / Spills, Leaks, Investigations and Cleanups (SLIC): A list that is maintained by Regional Water Quality Control Boards.
- Local County and City maintain lists for hazardous substances cleanup sites and leaking underground storage tanks.

4) The draft EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. If hazardous materials/wastes were stored at the site, an environmental assessment should be conducted to determine if a release has occurred. If so, further studies should be carried out to delineate the nature and extent of the contamination, and it will be necessary to estimate the potential threat to public health and/or the environment posed by the site. It may also be necessary to determine if an expedited response action is required to reduce existing or potential threats to public health or the environment. If no immediate threat exists, the final 2-4

remedy should be implemented in compliance with state regulations and policies. 2-4

5) All environmental investigation and/or remediation should be conducted under a workplan which is approved by a regulatory agency that has jurisdiction to oversee hazardous waste cleanup. 2-5

Prior to approving the draft EIR, please address all of DTSC's comments. As the lead agency, it is your responsibility to ensure that all of DTSC's concerns are properly addressed.

DTSC provides guidance for preparation of a PEA, and cleanup oversight, through its Voluntary Cleanup Program (VCP). For additional information on the VCP, please visit DTSC's web site at www.dtsc.ca.gov.

If you have any questions regarding this letter, please contact Mr. Johnson P. Abraham, Project Manager, at (714) 484-5476.

Sincerely,

Greg Holmes
Unit Chief
Southern California Cleanup Operations Branch
Cypress Office

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044

Mr. Guenther W. Moskat, Chief
Planning and Environmental Analysis Section
CEQA Tracking Center
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806

Response to Commentor No. 2
Greg Holmes, Department of Toxic Substances Control (DTSC)
April 30, 2004

2-1 A copy of the Notice of Completion (NOC) has been filed with the State Clearinghouse. The State Clearinghouse has indicated that they submitted the Draft EIR to selected state agencies for review (refer to Comment Letter Number 7, dated May 14, 2004).

2-2 In a letter dated March 2002, the DTSC provided the following comments regarding the Notice of Preparation (NOP) for the Draft EIR:

- The Draft EIR needs to provide the site history and past operations of the site.
- The Draft EIR should identify and determine whether current and/or historic uses at the site have resulted in any release of hazardous wastes/substances at the project site.
- If any past uses have resulted in the release of hazardous materials, appropriate mechanisms and/or remediation of the site needs to be identified.
- The site may fall under the "Border Zone of a Contaminated Property" if the site is located within 2,000 feet of an adjacent contaminated site.
- Project implementation may require soil excavation and filling, which will require appropriate sampling prior to the disposal of the excavated soil.
- If the project requires modifications or demolition to any existing structures, appropriate measures need to be taken regarding potential contaminates.
- If during construction activities, soil and/or groundwater contamination are suspected, construction in the project area should cease and the appropriate health and safety procedures should be implemented.

The Initial Study prepared for the proposed project in February 2002 addressed the potential impacts associated with Hazards and Hazardous Materials. The Initial Study concluded that the project would include hazardous materials that are typical of residential developments (i.e., household chemicals, pesticides, etc.). It is also stated that the project would include the storage of fuels associated with the marina facility. All hazardous materials would be subject to all local, state and federal regulations pertaining to the transport, use and storage of such material, which would ensure that any potentially significant impact regarding hazardous materials would be reduced to less than significant levels (please refer to Response VII (a-c) in the Initial Study).

Response VII (d) in the Initial Study indicates that the project site is not identified as a hazardous waste site per the County of San Bernardino "Identified Hazardous Waste Sites" map, dated December 1, 1994. To confirm that the project site is not

located on a hazardous waste site, RBF Consulting conducted a government records search via the California State Water Resources Control Board GeoTracker website on June 15, 2004. No listed properties were located within the boundaries of the project site. One (1) listed leaking underground storage tank (LUST) site was reported off-site to the east. However, the potential for a recognized environmental condition within the boundaries of the subject site caused by surrounding off-site properties is considered to be low due to the groundwater flow direction from the subject site, the distance from the subject site, and/or the status of the identified sites.

Additionally, it is noted that the project site has historically been undeveloped and consists of native forestlands. Based upon the March 15, 2002 field visit conducted by RBF Consulting, review of available aerial photographs, and interviews, the potential that adverse environmental conditions have been created by historical on-site activities is considered to be low. Per review of these field observations and records review, no recognized environmental conditions have been noted within the boundaries of the project site.

It is also recognized that if during construction activities, unknown wastes or suspect materials are discovered during construction by the contractor, which they believe may involve hazardous waste/materials, the contractor would implement typical operating procedures that would involve the following:

- Immediately stop work in the vicinity of the suspected contaminant, removing workers and the public from the area;
- Notify the Project Engineer of the implementing Agency;
- Secure the area as directed by the Project Engineer; and
- Notify the implementing agency's Hazardous Waste/Materials Coordinator.

The above is typical protocol in such in an instance when hazardous materials are suspected, however, the Contractor would consult with the appropriate implementing agency to determine the site-specific procedures in dealing with a suspected hazardous material.

2-3 Please refer to Response to Comment No. 2-2. RBF Consulting conducted a records search via the California State Water Resources Control Board GeoTracker website on June 15, 2004. No listed properties were located within the boundaries of the project site. One (1) listed leaking underground storage tank (LUST) site was reported off-site to the east. However, the potential for a recognized environmental condition within the boundaries of the subject site caused by surrounding off-site properties is considered to be low due to the groundwater flow direction from the subject site, the distance from the subject site, and the status of the identified sites.

2-4 Please refer to Response to Comment No. 2-2. Since the proposed project site and the adjacent properties are not recognized as having the potential for creating a significant risk to the public or the environment, it is not necessary to identify any contaminated sites.

2-5 Please refer to Response to Comment No. 2-4. No further environmental investigation and/or remediation are necessary to implement the project.

STATE OF CALIFORNIA - THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
Eastern Sierra-Inland Deserts Region
4775 Bird Farm Rd.,
Chino Hills, California 91709
Phone (909) 597-9823
Fax (909) 597-0067

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May 11, 2004

Mr. Matthew Slowik
San Bernardino County Land Use Services Department
385 N. Arrowhead, 1st Floor
San Bernardino, CA 92415-0182

Re: Draft Environmental Impact Report - SCH No. 2002021105
Moon Camp Tentative Tract No. 16136 Residential Subdivision

Dear Mr. Slowik:

The California Department of Fish and Game (Department) appreciates this opportunity to comment on the Draft Environmental Impact Report (DEIR) for the above-referenced project with regards to impacts to biological resources. The Department has some concerns with the proposed project with regards to impacts to biological resources. The project proposes a 95-lot residential subdivision with lots ranging in size from 0.17 acres (7,292 square feet) to 2.11 acres. Other components include access roads and a proposed boat dock with 100 boat slips. State Route 38 (also known as North Shore Drive) will be relocated to allow development of the lakeshore lots. The proposed project is located on the northwest shore of Big Bear Lake, in the community of Fawnskin, San Bernardino County, California. The site is situated between Flicker Road to the north, Big Bear Lake to the south, Polique Canyon Road to the east, and Oriole Lane/Canyon Road to the west. State Route 38 currently bisects the property.

The Department is responding as a Trustee Agency for fish and wildlife resources [Fish and Game Code sections 711.7 and 1802 and the California Environmental Quality Act Guidelines (CEQA) section 15386] and as a Responsible Agency regarding any discretionary actions (CEQA Guidelines section 15381), such as a Lake and Streambed Alteration Agreement and/or California Endangered Species Act Incidental Take Permit.

Jurisdictional Waters

The Department is concerned that the jurisdictional map (Exhibit 5.8-2) and the corresponding discussion (on Pages 5.8-7 through 5.8-8) did not include the areas along the lake shore as jurisdictional areas to the Department. The lake shore would be included within our jurisdiction, pursuant to Section 1600 *et seq.* of the Fish and Game Code. This area should be identified as jurisdictional even if no impacts will occur to this area. Under Section 1600 *et seq.* of the Fish and Game Code, the Department requires the project applicant to notify the Department of any activity that will substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or

3-1

lake or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. The lake level will vary considerably from one time to the next due to water availability in a given year (rainfall, drought etc.). The jurisdictional area along the lake edge should be based on current as well as historical lake levels and should include the area up to the ordinary high water mark. Also, the existing habitats along the lake shore indicate they are associated with the lake. Therefore, any areas along the lake shore that contain wet meadow, marsh, and/or riparian habitat should also be included as jurisdictional pursuant to Section 1600 *et seq.* of the Fish and Game Code. In addition, if any impacts will occur within the jurisdictional areas along the lake shore, then these impacts will need to be included in a notification to the Department for a Lake and Streambed Alteration Agreement, along with appropriate mitigation for its loss. The Department recommends the Jurisdictional Map be revised to include jurisdictional areas along the lake shore as well as the corresponding discussion on Pages 5.8-7 and 5.8-8. 3-1

Pages 5.8-59 through 5.8-60 also need to be revised to reflect the lake as a jurisdictional area to the Department. On Page 5.8-60, under the heading "California Department of Fish and Game", the text should also be revised to incorporate the Departments new timelines for processing a notification package, pursuant to Section 1600. The Department now has 30 days to review the package. Once the Department has determined the notification to be complete, the Department has another 60 days to prepare a draft Lake and Streambed Alteration Agreement, if deemed necessary. 3-2

The Department is also concerned that mitigation for impacts to the streams, lakes, and associated habitat was not included in the DEIR. Instead, mitigation was deferred to the regulatory permit processes for a 404, 401, and Lake and Streambed Alteration Agreement by the U.S. Army Corps, the Regional Water Quality Control Board, and the Department, respectively. The Department believes it is not appropriate to defer mitigation to another permitting process during CEQA. Impacting a lake and/or stream and associated habitat is considered a significant impact under CEQA. Therefore, mitigation is required under CEQA to reduce the impact to less than significant.

3-3

The Guide to the California Environmental Quality Act 1999 discusses the responsibility of the lead agency to mitigate potential project impacts and not defer this responsibility to other agencies with regulatory powers if potentially feasible mitigation measures are within its authority and power (*Citizens for Quality Growth*). The Department believes that it is well within the Lead Agency's authority to identify project impacts, present alternatives, and propose mitigation measures to offset these impacts. Section 15002 of the CEQA Guidelines defines the purpose of CEQA to:

1) Inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities,
2) Identify ways that environmental damage can be avoided or significantly reduced,
3) Prevent significant, avoidable damage to the environment by requiring changes in project through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible, and
4) Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

Section 151370 of the CEQA guidelines includes a definition of mitigation. It states that mitigation includes:

1) Avoiding the impact altogether by not taking a certain action or parts of an action,
2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation,
3) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment,
4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action,
5) Compensating for the impact by replacing or providing substitute resources or environments. 3-3

Nowhere in this list of definitions does it state that conformance with regulatory requirements is mitigation.

Permit negotiations conducted after and outside of the CEQA process deprive the public of its rights to know what project impacts are and how they are being mitigated in violation of Section 15002. Also, because mitigation to offset the impacts were not identified in the CEQA document, the Department does not believe that the Lead Agency can make the determination that "impacts to jurisdictional water present on the project site would be reduced to a less than significant level through compliance with the regulatory process (i.e. 404 permit, CDFG agreement, 401 certification)", without knowing what the specific mitigation measures are that will reduce those impacts. Therefore, the Department recommends the Lead Agency include the following mitigation measure in the DEIR.

Mitigation Measure for Lake and Stream and Associated Habitat Impacts:

All unavoidable impacts to State jurisdictional lakes, streams, and associated habitat shall be compensated for with the creation and/or restoration of in-kind habitat on-site or off-site at a 3:1 replacement-to-impact ratio. 3-4

Additional mitigation requirements through the Department's Lake and Streambed Alteration Agreement process may be required depending on the quality of habitat impacted, proposed mitigation, project design, and other factors. We recommend submitting a notification early on, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources. To obtain a Lake and Streambed Alteration Agreement notification package, please call (562) 590-5880 or obtain on-line at the Department's website "www.dfg.ca.gov".

Special Status Plants

Mitigation Measure 5.8-1a on Page 5.8-63 of the DEIR indicates that, at a minimum, 11.8-acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the federally-listed Threatened ash-gray Indian paintbrush, would need to be mitigated for by funding the purchase of 35.4 acres of offsite habitat from the California Wildlife Foundation (if the agreed mitigation ratio is 3:1). The Department agrees that 3:1 replacement-to-impact ratio would be acceptable if the habitat value of the land to be preserved is equal to or of greater importance biologically than the habitat being impacted. The 3-5

Department is also concerned that the mitigation requirement only requires the funding of the purchase of land. The Department believes since the mitigation area is large, the project proponent needs to identify appropriate land, purchase the land, and preserve it in perpetuity through a conservation easement in the name of an approved entity. An endowment account also needs to be provided to ensure long-term monitoring and management of the preserved area. We recommend that the mitigation requirement for the compensation for loss of habitat doesn't limit the funding to the CA Wildlife Foundation. The Department recommends the project proponent actually identify and purchase the land to be preserved prior to commencing project activities and supply the entity to manage the habitat with a non-wasting endowment for the monitoring and management of the preservation site in perpetuity. The Department recommends revising Mitigation Measure 5.8-1a accordingly. 3-5

The Department believes the intention of Mitigation Measure 5.8-1a was to provide compensation for the loss of special status botanical resources. In the last paragraph of Measure 5.8-1a, it states that "the applicant is responsible for the mitigation of a minimum of 11.8-acres of pebble plain and open Jeffrey pine forest". The Department recommends revising the Mitigation Measure to clarify that the project applicant shall purchase and preserve a minimum of 35.4 acres (3:1 replacement-to-impact ratio) of open Jeffrey Pine and pebble plain habitat, that contains sensitive plant species, including Ash-gray Indian paintbrush as well as others know to occur on the site. It is the Department's understanding that this would be additional to any pebble plain habitat purchased to meet the requirement in Mitigation Measure 5.8-1g. Please clarify and revise accordingly. 3-6

Bald Eagles

The Department is concerned with potential impacts to bald eagles. The bald eagle is a species listed as State Endangered and Federally Threatened. Bald eagles are known to utilize the site, especially along the lake shore. They were observed using several trees on the project site for perch and roost locations. The DEIR indicated that a records search demonstrated that some of the most utilized perch and roost trees on the north shore of the lake are located on the project site. In 2002 surveys conducted by Bon Terra Consulting, bald eagles were observed utilizing nine trees on the project site. In Exhibit 5.8-3 of the DEIR, locations of nine perch trees on the project site are shown, of which seven are located along the lakeshore south of the proposed relocation of Lake Shore Drive. In surveys conducted in 1989-1990, it was found that 80 of the 176 mapped eagle sightings (45%) were located on the project site. The highest recorded use of a single perch tree was tree number 886, which had 51 sightings. The surveys found that this tree is the most important perch tree on the property and is potentially the most important on the north shore of Big Bear Lake. Based on the DEIR, it appears that approximately 31 lots are proposed for development along the lakeshore, one of which will be a parking lot and the others will have homes constructed on them. The Department believes that due to the sensitivity of the area and importance of the area to bald eagles, the amount of development within the lake shore portion of the site should be greatly reduced. The Department agrees that the proposed noise mitigation measures will help reduce, to some extent, the impacts on the eagles, but due to the amount of development in the area of these perch locations, the measures are not enough to prevent impacting the eagles. The Department believes that impacts to the bald eagles will be significant even with the measures proposed. 3-7

Therefore, we recommend looking at alternatives that would reduce the number of homes along the lake shore and avoid development in areas around the perch trees. 3-7

Thank you for this opportunity to comment. Please contact me at (949) 458-1754, if you have any questions regarding this letter or need further coordination on these issues.

Sincerely,

Leslie MacNair
Staff Environmental Scientist
Habitat Conservation Planning

cc: Nancy Ferguson, USFWS, Carlsbad
State Clearinghouse, Sacramento

Response to Commentor No. 3
Leslie MacNair, California Department of Fish and Game (CDFG)
May 11, 2004

3-1 The Delineation of Jurisdictional Waters referenced in the Draft EIR has been updated to include the areas along the lakeshore as jurisdictional areas to the CDFG. The jurisdictional area along the lake edge is reflective of the ordinary high water mark. The updated analysis cites the requirement for the project to obtain a 1602 Streambed Alteration Agreement from the CDFG.

Page 5.8-7 of the Draft EIR, Paragraph 5 has been revised in the Final EIR as follows:

> Vegetation within the drainages of the Project site consisted of upland habitat, dominated by Jeffery pines. Soils within the drainage were documented to be silty-sand (large grain). Soil samples taken on-site were generally dry and lacked characteristics of hydric soils (i.e., odor, streaking, mottling). ~~No flow within the on site drainages was observed during the March 15, 2002 field visit. However, evidence of an OHWM was observed within the drainages, primarily indicated by sediment deposits.~~ No flow within the on-site drainages was observed during the March 15, 2002 field visit. However, evidence of an OHWM was observed within the drainages, primarily indicated by sediment deposits. It should also be noted that Big Bear Lake adjoins the project site to the south. Based on discussions with the Big Bear Municipal Water District, the current water level of Big Bear Lake (as of June 28, 2004) is 6,727.8-feet above mean sea level (msl). The high water mark is reported to be 6,743.2 feet above msl.

Page 5.8-8, Paragraphs 4 and 5 of the Draft EIR, has been revised in the Final EIR as follows:

> Based on the results of the field observations and data collection, 0.15-acre of Corps jurisdictional "waters of the U.S." were identified within the Project site. ~~The drainages are ephemeral.~~ In addition to on-site ephemeral drainages, the Corps considers Big Bear Lake jurisdictional. The Corps' jurisdictional limits are delineated at the high water line, which is reported to be at 6,743.2-foot elevation (and below).
>
> California Department of Fish and Game (1602) Jurisdiction. Based on the results of the field observations and data collection, 0.15-acre of CDFG jurisdictional streambed~~waters~~ was~~were~~ identified within the Project site. As with the Corps, Big Bear Lake would be considered jurisdictional by the CDFG, including the approximate 4.14-acre lake shoreline.

3-2 As stated in Response to Comment No. 3-1, the Delineation of Jurisdictional Waters has been updated to reflect the CDFG comments. The CDFG discussion now reflects the most current lake and streambed alteration program, including Sections 1600-1616 and the timelines/thresholds contained therein.

Page 5.8-59, Paragraphs 3 and 4 of the Draft EIR have been revised in the Final EIR as follows:

WATERS OF THE U.S. (NON-WETLAND) DETERMINATION

Based on the results of the field observations and data collection, RBF identified 0.15-acre of Corps jurisdictional "waters of the U.S." within the proposed Project site. The drainages are ephemeral; Big Bear Lake, although not included in the acreage calculation, is also considered jurisdictional by the Corps. Utilizing the most current development plans, it was determined that ~~roadway~~ the proposed improvements would impact approximately 0.2~~0~~4-acre of Corps jurisdiction. Discharges include approximately 0.04-acres to ephemeral drainages and approximately 0.20-acres of impact as a result of fill material associated with the proposed marina.

CALIFORNIA DEPARTMENT OF FISH AND GAME (1602~~3~~) JURISDICTION

Based on the results of the field observations and data collection, RBF identified 0.15-acre of CDFG jurisdictional streambed~~waters~~. Utilizing the most current development plans, it was determined that ~~roadway~~ the proposed improvements would impact 4.38~~0.04~~-acres of CDFG jurisdiction (includes streambed, shoreline, and lake impacts) (refer to Exhibit 5.8-2, *Jurisdictional Map)*.

Page 5.8-60, Paragraph 1 of the Draft EIR, has been revised in the Final EIR as follows:

California Department of Fish and Game

~~As noted above, the drainage within the proposed Project area meets the CDFG's definition as streambed and thus would be regulated by the CDFG. An agreement from the Department would be required. The CDFG agreement requires a fee and approximately 45 days processing time.~~ As noted above, areas within the Project site meet the CDFG's definition as streambed and lakebed. Since improvements associated with the proposed project would impact CDFG Jurisdiction, a 1602 Streambed Alteration Agreement (SAA) must be obtained prior to construction. A processing fee and CEQA c~~C~~ompliance is necessary in order for the Agreement to be issued.

Page 5.8-60, Paragraph 3 of the Draft EIR, has been revised in the Final EIR as follows:

~~Overall, impacts to the jurisdictional water present on the Project site would be reduced to a less than significant level through cojpliance with the regulatory process (i.e., 404 permit, CDFG agreement, 401 certification.)~~ Implementation of the recommended mitigation measure (Mitigation Measure 5.3-8a) regarding a 3:1 replacement-to-impact ratio for all unavoidable impacts to jurisdictional areas would ensure that significant impacts to jurisdictional waters are reduced to a less than significant level. Compliance with the regulatory process (i.e., 404 permit, CDFG agreement, 401 certification) would ensure the enforcement and implementation of the recommended mitigation measure. It is also noted that additional mitigation requirements may be required through the permitting process depending on the quality of habitat impacted, project design and other factors.

Page 5.11-6, Paragraphs 1, 2 and 3 of the Draft EIR, have been revised in the Final EIR as follows:

WATERS OF THE U.S. (NON-WETLAND) DETERMINATION

~~The unnamed drainages within the Project site exhibited evidence of flow (i.e., sediment/silt deposition) sufficient to document the Ordinary High Water Mark (OHWM) (i.e., channel bed and bank lines), thus meeting the criteria for jurisdictional waters.~~ Evidence of an Ordinary High Water Mark (OHWM) was observed within the on-site ephemeral drainages, primarily indicated by sediment deposits. It should also be noted that Big Bear Lake adjoins the project site to the south. Based on discussions with the Big Bear Municipal Water District, the current water level of Big Bear Lake (as of June 28, 2004) is 6,727.8-feet above mean sea level (msl). The high water mark is reported to be 6,743.2 feet above msl. Refer to ~~Appendix 15.10, *Jurisdictional Delineation*, and~~ Exhibit 5.8-2, *Jurisdictional Map*, for an illustration of jurisdictional boundaries.

Based on the results of the field observations and data collection, RBF identified 0.15-acre of Corps jurisdictional "waters of the U.S." within the proposed project site. ~~The drainages are ephemeral.~~ In addition to on-site ephemeral drainages, the Corps considers Big Bear Lake jurisdictional. The Corps' jurisdictional limits are delineated at the high water line, which is reported to be at 6,743.20-foot elevation (and below).

CALIFORNIA DEPARTMENT OF FISH AND GAME (1602~~3~~) JURISDICTION

Based on the results of the field observations and data collection, RBF identified 0.15-acre of CDFG jurisdictional streambed~~waters~~ located within the boundaries of the Project site (refer to Exhibit 5.8-2, *Jurisdictional Map)*. As with the Corps, Big Bear Lake would be considered jurisdictional by the CDFG, including the approximate 4.14-acre lake shoreline. Utilizing the most current development plans, it was determined that the proposed improvements would impact 4.38-acres

of CDFG jurisdiction (includes streambed, shoreline, and lake impacts). Refer to Section 5.8, *Biological Resources*, for further discussion regarding jurisdictional waters.

3-3 Rather than deferring to the regulatory process to reduce impacts to jurisdictional waters to less than significant levels, the analysis has been updated to include mitigation that all unavoidable impacts to State jurisdictional lakes, streams, and associated habitat be compensated for with the creation and/or restoration of in-kind habitat on-site or off-site at a 3:1 replacement-to-impact ratio. Additionally, the analysis of jurisdictional waters has been updated to reflect the definition of mitigation, per Section 151370 of the CEQA guidelines.

Page 5.8-58, Impact Statement 5.8-3 of the Draft EIR has been revised in the Final EIR as follows:

JURISDICTIONAL WATERS

5.8-3 *Development of the proposed Project ~~does not have~~has the potential to impact jurisdictional waters. Analysis has concluded that potentially significant impacts would be reduced to a less than significant level~~impact would occur in this regard after regulatory compliance~~ with implementation of the recommended mitigation measures.*

The following paragraph, to be added below Paragraph 1 on Page 5.8-59 Draft EIR, will be included in the Final EIR:

Mitigation may be required by the regulatory agencies during the permit process. Compensatory mitigation for the loss of jurisdictional function and values is a fundamental component of the applicant regulatory programs. Mitigation can take several forms. It can consist of (1) avoidance or minimization of impacts, (2) compensation in the form or habitat creation, restoration and enhancement, or (3) compensation through participation in a mitigation bank. The first type of mitigation is preferred by the agencies. For any project that impacts jurisdictional areas, it is also preferred by the agencies that compensation through the creation of habitat be performed on-site and in-kind (i.e., riparian woodland for riparian woodland). Conceptual mitigation will be discussed during the Pre-Application Field Meeting with the regulatory agencies. However, the exact requirements of any special permit conditions and mitigation established for this project would be dictated by the regulatory agencies following the review of the formally submitted project applications.

Page 5.8-66, Mitigation Measure 5.8-3 of the Draft EIR, has been revised in the Final EIR as follows:

JURISDICTIONAL WATERS

5.8-3 ~~No mitigation measures are recommended.~~ Per the direction of the California Department of Fish and Game, all unavoidable impacts to State and Federal jurisdictional lakes, streams, and associated habitat shall be compensated for with the creation and/or restoration of in-kind habitat on-site and/or off-site at a minimum 3:1 replacement-to-impact ratio. Additional requirements may be required through the permitting process depending on the quality of habitat impacted, project design and other factors.

3-4 As stated in Response 3-3, mitigation has been incorporated to include a requirement for a 3:1 replacement-to-impact ratio for all unavoidable impacts to State jurisdictional lakes, streams, and associated habitat.

3-5 Mitigation Measure 5.8-1a has been updated in accordance with the CDFG's comments.

Page 5.8-47, Paragraph 3 of the Draft EIR, has been revised in the Final EIR as follows:

Pebble Plains. A total of 0.69 acre of pebble plain habitat would be impacted by Project implementation. Approximately 379 acres of pebble plain are known to exist in the San Bernardino Mountains, 60 percent (227 acres) of which occurs on public lands. Development of the Project site would remove 0.18 percent of the remaining acreage of pebble plain known to occur on both public and private lands. Although the proposed Project would impact a small area of pebble plain habitat relative to the amount of this vegetation type within the San Bernardino Mountains, Mitigation Measure 5.8-1~~ga is recommended to~~ would ensure that impacts are reduced to less than significant levels.

Page 5.8-63, Mitigation Measure 5.8-1a of the Draft EIR, has been revised in the Final EIR as follows:

SPECIAL STATUS PLANTS AND VEGETION TYPES

5.8-1a ~~Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on listed special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could~~

~~not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented.~~

~~The project applicant shall pay compensation for the loss of special status botanical resources identified on the project site by the survey by funding the purchase and management of off-site habitat through contributions to a fund established by the California Wildlife Foundation on behalf of the CDFG. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development).~~

~~If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the project applicant is responsible for the mitigation of a minimum of 11.8 acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the federally-listed Threatened ash-gray Indian paintbrush (i.e., would be required to fund the purchase of 35.4 acres of offsite habitat from the California Wildlife Foundation if the agreed mitigation ratio is 3:1).~~

Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented. Pebble plain habitat acreages will be recalculated following the survey using criteria established by the Habitat Management Guide for Pebble Plain Habitat on the National Forest System (2002).

The Project Applicant shall pay compensation for the loss of special status botanical resources identified on the project site during the survey by funding the purchase, establishment of a conservation easement, and management of off-site habitat within the conservation easement by an entity approved by the CDFG. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio of 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development). Prior to the initiation of clearing or grading

activities on the project site, the conservation easement will be established, the management entity will be approved by the CDFG, and a non-wasting endowment will be established for the monitoring and management of the preservation site by the management entity in perpetuity.

If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the Project Applicant is responsible for mitigating impacts to a minimum of 11.8-acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the Federally-listed Threatened ash-gray Indian paintbrush. As such, the applicant would be required to fund the purchase and maintenance of 35.4-acres of offsite pebble plain and open Jeffrey pine forest habitat that contains special status plant species, including Ash-gray Indian paintbrush and others known to occur on the site.

3-6 Mitigation Measure 5.8-1g has been deleted. Mitigation Measure 5.8-1a has been revised to reduce impacts to special status vegetation types to less than significant levels. The Draft EIR text has been modified to reflect this change (refer to Response to Comment No. 3-5).

Page 5.8-65, Mitigation Measure 5.8-1g of the Draft EIR, has been deleted in the Final EIR as follows:

~~**SPECIAL STATUS VEGETION TYPES**~~

~~5.8-1g Exterior construction shall be prohibited between the dates of December 1 and April 1 (of each year). Significant impacts to pebble plain habitat can be mitigated to a less than significant level through off-site preservation. The project applicant shall pay compensation for the loss of special status botanical resources identified on the site, by the survey, by contributing to the funding of purchase and management of off-site habitat. The Applicant shall acquire habitat in the Big Bear Valley and dedicate to the CDFG or suitable conservation organization. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development. An area containing no less than 2.1 acres of pebble plain habitat in an area located adjacent to other open space areas within the project vicinity shall be preserved in perpetuity. The preserved areas shall be protected from future development through a conservation easement or other appropriate mechanism.~~

3-7 The County shall consider the Commentor's opinion and comments during their deliberation on the project. It is also noted that the "Reduced Density, Without Road Widening and Without Marina" Alternative would eliminate the widening of SR-38 and all development along the shore to the south of SR-38. This alternative would reduce the intensity of many of the impacts to biological resources on the project site, including perching and roosting bald eagles. Direct impacts to the tree most commonly used by perching bald eagles (i.e., tree number 886) would most likely be avoided. However, based upon available references, this alternative would directly impact bald eagle perch trees and indirectly impact the remaining recorded bald eagle perch trees. Therefore, although environmentally superior to the proposed project, the "Reduced Density, Without Road Widening and Without Marina" Alternative would nonetheless result in a significant impact to the bald eagle.

COMMENT NO. 4

STATE OF CALIFORNIA — ARNOLD SCHWARZENEGGER, Governor

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May 12, 2004

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Tracy Creason
San Bernardino County Land Use Services Department
385 N. Arrowhead Ave, Third Floor
San Bernardino, CA 92415-4147

Tracy Creason:

RE: Moon Camp Residential Subdivision, TT16136 Draft Environmental Impact Report SCH2002021105

We have reviewed the Draft Environmental Impact Report (DEIR) for the above referenced project. Several significant environmental issues have been identified in the DEIR that are of concern to OES. In reviewing the DEIR and other information available, we noted that the following conditions exist in the project area:

- The property is located adjacent to San Bernardino National Forest Service lands. In addition, the proposed project is located in a coniferous forest, creating an urban/wildland interface.
- The EIR indicates that the Insurance Service Organization (ISO) rating for Fawnskin is a 9 based on a scale of 1 to 10. This rating indicates that due to circumstances related to fire protection and terrain, this area is a high risk for fire.
- The National Forest Service Remote Sensing Laboratory GIS files show the project site to be in an area of high tree mortality (between 11%-100% mortality rate).
- The project site is located in an area where bark beetle infestation has been a problem and may over time increase the risk of fire.
- The project site is also located within a Fire Safety Overlay District, also indicating that there is a risk of fire in the area.

These conditions indicate a high probability that the project site could be impacted by wildfires and pose a significant fire threat. In addition, there are several elements of the proposed subdivision that are of a concern in regard to public safety.

Public Safety Concerns Identified in the DEIR

According to the DEIR, the County of San Bernardino Fire Department provides fire protection to the Fawnskin area. The project area is served by Fire Station No. 49, approximately three quarters (3/4) of a mile northwest of the project site. The local fire station consists of only two full time personnel and eight to ten volunteer fire fighters. The DEIR states that this lack of man power must be mitigated through increased fire flow, the installation of individual sprinkler systems in the homes, and a 100-foot fuel modification zone extended beyond property lines and a 300-foot modification zone in areas of steeper slopes. This fuel modification zone will

4-1

encroach upon forest service land and will require a permit from San Bernardino National Forest. There is no indication in the DEIR if the National Forest Service will grant this request. 4-1

The DEIR states that the project will extend water supply capacities beyond existing limits. Project developers propose to examine and rehabilitate if necessary two existing wells that should supply adequate yield. In addition, a new 300,000 – 400,000 gallon water storage reservoir has been proposed. The applicant also proposes measures to mitigate the limited water availability by restricting individual wells within the proposed subdivision and strict water conservation measures. However, there is no explanation of how these water conservation measures will be enforced. 4-2

All water supplies for the area are derived from groundwater sources. There has been inconclusive testing of potential overdraft conditions with the North Shore Hydrologic Subunit. As a result, the DEIR concludes that the project will have impacts that are significant and unavoidable due to inconclusive testing of the potential overdraft conditions for the North Shore Hydrologic Subunit. 4-3

Public Safety Mitigation

OES is concerned with using increased fire flow and individual sprinkler systems as mitigation when there are serious concerns about long-term water supply availability from groundwater sources. OES is also concerned about the ability of the fire department to initially respond to a major fire in the area given the conditions noted previously, the lack of adequate water supply, and the size and makeup of the fire department. Additionally, other development projects are also planned in the area that will compound the water supply and public safety issues. 4-4

To improve public safety, the Final EIR should explore other mitigation measures that will reduce the water supply and fire safety impacts noted in the DEIR. These mitigation measures could include but are not limited to: 4-5

- Requiring that a homeowners association be formed to fund additional permanent fire fighting positions or improving the fire fighting equipment that serves the proposed subdivision.

- Requiring the developer to retrofit existing residential or commercial development in the area with water conservation devices that would provide additional water supply to the proposed subdivision.

- Requesting the fire department to determine how surface water from Big Bear Lake could be used for fire fighting purposes. This may involve the purchase of specialized equipment such as pumps or hoses that the proposed subdivision would fund.

Thank you for the opportunity to comment on your DEIR. If you have any questions regarding our comments, please contact Mary Ann Hadden, Associate Environmental Planner at (916) 845-8269.

Sincerely,

Dennis Castrillo
OES Environmental Officer

Response to Commentor No. 4
Dennis Castrillo, California Governor's Office of Emergency Services
May 12, 2004

4-1 In their letter dated May 14, 2004, the San Bernardino National Forest Service (NFS) Mountaintop District indicated that it would not support the issuance of a permit or easement on NFS land for the fuel modification zone that would extend beyond the project boundaries (refer to Comment Letter No. 6). Exhibit 3-4, *Site Plan*, has been updated to illustrate that the proposed project would include a fuel modification zone entirely located within the project's boundaries. Therefore, it would not be necessary for the project to obtain an easement or permit from the NFS to comply with the FS1 Fire Safety Overlay District requirements, as set forth in the County's General Plan (refer to Response to Comment No. 13-27).

Page 5.1-11 of the Draft EIR, Paragraph 4 and the proceeding text has been revised in the Final EIR as follows:

The Project site is located within the following four Overlay Districts: the Fire Safety (FR~~S~~) Overlay District; Geologic Hazard (GH) Overlay District; the Biotic Resources (BR) Overlay District; and the Scenic Resources (SR) Overlay District. The FR~~S~~ Overlay District is created to provide greater public safety in areas prone to wildland brushfires, by establishing additional development standards for these areas. ~~The FR Overlay District is created to provide greater public safety in areas prone to wildland brushfires, by establishing additional development standards for these areas. The FR Overlay District is divided into two review areas, each of which represents a different level of wildland hazard. A different set of requirements is applied in each review area. The provisions for these requirements are cumulative in that all of the requirements that are specified for Fire Safety Review Area 2 shall also apply to Fire Safety Review Area 1, in addition to those specified for only Fire Safety Review Area 1.~~ The project site is located within Fire Safety Area 1 (FS1).

- ~~Fire Safety Review Area 1 (FR1).~~ Fire Safety ~~Review~~ Area 1 includes wildland areas that are marginally developable, areas which are not likely to be developed, and the area of transition between wildlands and areas that are partially developed or are likely to be developed in the future. The area of transition is often characterized by an abrupt slope change. Natural hazards are prevalent throughout Area 1, especially in areas with natural ungraded slopes greater than thirty percent (30%). Area 1 includes areas of very high to extreme fire hazard.

- ~~Fire Safety Review Area 2 (FR2). Land within Area 2 is relatively flat, and is either partially or completely developed, or, if it is not developed, is usually suitable for development. Present and future development within Area 2 is exposed to the impacts of wildland fires and other natural hazards primarily due to its proximity to Area 1.~~

Since ~~T~~the ~~P~~project ~~site~~ is located within a FS1 designated area, it is ~~located~~

~~within Fire Safety Review Area 2 (RR2), therefore would be~~ subject to compliance with various requirements relative to construction, building separations, project design, and erosion and sediment control as specified in Section 85.020220, ~~Area FR1 and FR2 Requirements~~ *Building Standards for FS1*.

Page 5.3-1 of the Draft EIR, Paragraph 4 has been revised in the Final EIR as follows:

The Project site is located within a Fire Safety (FR~~2~~S) ~~Overlay District~~ Area ~~2~~1 (FR~~2~~S1), as designated by the County of San Bernardino General Plan Hazard Maps. FS1 areas are subject to compliance with various requirements relative to construction, building separations, project design, and erosion and sediment control as specified in Section 85.020220, ~~Area FR1 and FR2 Requirements~~ *Building Standards for FS1*, of the County Development Code. The provisions of the FR~~2~~S1 District apply to all phases of development. Refer to Section 5.1, *Land Use and Relevant Planning*, for further discussion of Fire Safety Overlay District requirements.

Page 5.3-11 of the Draft EIR, Paragraphs 1, 2 and 3 have been revised in the Final EIR as follows:

The San Bernardino County Fire Department has indicated that ~~the manpower demand as a result of the proposed project would need to be mitigated through increased fire flow~~ due to the size and scale of the proposed project, specific fire flow requirements would need to be met. Instead of 1,500 gpm at 2 hours (which is based on a maximum square foot house of 3,600 square feet), the fire flow requirement would be 1,750 gpm at 2 hours, based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm at 2 hours, based on homes greater than 4,800 square feet. ~~Fire sprinklers would be required for each residence in lieu of additional manpower.~~ Homes above 5,000 square feet would have a larger sprinkler requirement.

A fuel modification area and plan program would be required ~~which would not terminate at a property line~~for the proposed project under the provisions of the FS1 Fire Safety Overlay District. ~~The 100 foot fuel modification requirement would extend beyond the property lines. Where such fuel modification zone extends on to U.S. Forest Service land, an easement or permit would be required. The 100 foot fuel modification zone may be greater in steeper areas (up to 300 feet), as determined by the fire agency.~~Per the requirements of the FS1 Overlay District, the project would require a 30-foot setback from the National Forest. The project proposes 100-foot fuel modification zone adjacent to National Forest land, located to the north and east of the project area. As shown in Exhibit 3-4, *Site Plan*, the fuel modification zone would be located within the project boundaries on Lots 15 to 16 and 20 to 29. A Fuels Management Plan would be established for the project to implement the fire safety requirements of the FS1 Overlay District. The Fuels Management Plan would be subject to review and approval by the San Bernardino

National Forest Service and the San Bernardino County Fire Department.

The fire flow requirements and ~~fuel modification~~Fuel Management Plan~~requirements~~ along with additional mitigation measures listed would reduce impacts to fire protection services to a less than significant level.

4-2 A Homeowners Association would enforce the water conservation measures identified in Mitigation Measure 5.3-6d.

Page 5.3-23, Mitigation Measure 5.3-6d of the Draft EIR, Paragraph 7 has been revised in the Final EIR as follows:

5.3-6d The following water conservation measures are the minimum measures that shall be complied with in conjunction with domestic water supply to the project. A Homeowners Association shall be responsible for enforcing the water conservation measures. Additional measures may be imposed as a result of a contract for water supply between CSA 53-C and the City of Big Bear Lake DWP:

4-3 Comment is noted.

4-4 The identified mitigation measures (5.3-1a to 5.3-1e) and project plans would be subject to review and approval by the Fire Department. The Fire Department has indicated that the recommended mitigation measures are appropriate to meet fire protection service needs for development of the project site. The project will also include a Fuels Management Plan, which will include a Fuel Modification Zone adjacent to National Forest Lands to the north and east of the project site (refer to Response to Comment Nos. 4-1 and 13-13). Water storage for fire fighting purposes would be provided through implementation of Mitigation Measure 5.3-6c, which states that Project Applicant would advance funds towards the expansion of the Cline Miller Reservoir. The EIR concludes that impacts to groundwater resources are significant and unavoidable and that additional technical review needs to be provided to prove that water resources are available to meet the long-term water demands of the project. It will be the responsibility of the Project Applicant to prove that water resources are available to meet the water demands of the project, which include fire flow requirements. The County will consider the Commentor's opinion and comments during their deliberation on the project.

Page 5.3-22 of the Draft EIR, Mitigation Measures 5.3-1b to 5.3-1f have been revised in the Final EIR as follows:

5.3-1b ~~Fire sprinklers for each residence shall be provided in lieu of additional manpower.~~ All residences less than 5,000 square feet shall be subject to the standard fire sprinkler requirement (NFPA 13D). Homes above 5,000 square feet shall be subject to the NFPA13R~~have a larger~~ sprinkler requirement ~~(FPA13R)~~.

5.3-1c A ~~f~~Fuels ~~modification program~~Management Plan, with specifications, shall be prepared and subject to approval by the County of San Bernardino Fire Department and San Bernardino National Forest Service. The Fuels Management Plan shall implement the fire safety requirements of the FS1 Fire Safety Overlay District, including a 30-foot minimum setback requirement from the National Forest. The fuel modification zone shall be located entirely within the project's boundaries. ~~The 100 foot fuel modification requirement shall not terminate at a property line. The 100 foot fuel modification requirement shall extend beyond property lines. Where such fuel modification zone extends onto U.S. Forest Service land, an easement or permit shall be required to be obtained.~~ The minimum~~100 foot~~ fuel modification zone requirements may be greater in steeper areas (up to 300 ft.), as determined by the Fire ~~Agency~~ Department.

5.3-1d Cul-de-sac lengths shall be no longer than 350 feet.

5.3-1e A Homeowner's Association or a Special District shall be established to ~~assure~~ implement the Fuels Management Plan. The Fuels Management Plan shall specify any professional assistance, if necessary, to implement the action portion of the plan. The Plan shall determine if a Registered Professional Forrester is necessary for professional guidance to implement the Plan. ~~Long-term vegetation maintenance. An annual vegetation maintenance program shall be included.~~ The HOA or Special District is to be responsible for fuel modification in common areas.

~~5.3-1f Fire resistance/drought tolerant landscaping shall be required and referenced in the Homeowner's Association or Special District Standards.~~

4-5 The identified mitigation measures in the EIR have been recommended to reduce potentially significant impacts to less than significant levels to the maximum extent feasible. However, the County may want to explore the recommended mitigation measures by the OES in future water and fire safety planning. The County will consider the Commentor's opinion and comments during their deliberation on the project.

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Riverside County Transportation Commission: Robin Lowe, Hemet

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May 12, 2004

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385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

RE: SCAG Clearinghouse No. I 20040198 Moon Camp Residential Subdivision TT No. 16136 DEIR

Dear Mr. Slowik:

Thank you for submitting the **Moon Camp Residential Subdivision TT No. 16136 DEIR** for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies. 5-1

We have reviewed the **Moon Camp Residential Subdivision TT No. 16136 DEIR**, and have determined that the proposed Project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and California Environmental Quality Act (CEQA) Guidelines (Section 15206). The proposed project is not a residential development of more than 500 dwelling units. Therefore, the proposed Project does not warrant comments at this time. Should there be a change in the scope of the proposed Project, we would appreciate the opportunity to review and comment at that time.

A description of the proposed Project was published in SCAG's **April 1-15, 2004** Intergovernmental Review Clearinghouse Report for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this Project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1867. Thank you.

Sincerely,

JEFFREY M. SMITH, AICP
Senior Regional Planner
Intergovernmental Review

Printed on Recycled Paper 559-a/20/04

Response to Commentor No. 5
Jeffrey M. Smith, Southern California Association of Governments
May 12, 2004

5-1 The Southern California Association of Governments (SCAG) has reviewed the Draft EIR and has determined that the proposed project is not regionally significant per SCAG Intergovernmental Review Criteria and CEQA guidelines (Section 15206). No further response to this comment is necessary at this time.

United States Department of Agriculture | Forest Service | San Bernardino National Forest Mountaintop District | P.O. Box 290 Fawnskin, CA 92333 909-866-3437 (Voice) 909-866-2867 (FAX) 909-866-3233 (TTY)

File Code: 2670/5400
Date: May 14, 2004

Matthew Slowik
Senior Associate Planner
County of San Bernardino, Land Use Services Dept,
Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

Subject: Moon Camp DEIR

Dear Mr. Slowik:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Report for the proposed Moon Camp Residential Subdivision and associated proposed actions (DEIR). The San Bernardino National Forest has several concerns regarding this proposed project, listed as follows:

1. The San Bernardino National Forest finalized a Habitat Management Guide for Pebble Plain habitat on National Forest System (NFS) lands in September, 2002. This document contains a set of habitat definitions for pebble plains that allow for consistent mapping standards. Important pebble plain habitat supporting multiple threatened, endangered, and sensitive plant species occurs on NFS land along the ridge immediately north of the proposed project. Based on species composition and the distribution of Morical soils described in the DEIR, substantially more pebble plain habitat occurs on the Moon Camp property than is presented in the DEIR. It is likely that most of the area described as "open Jeffrey pine forest", approximately 17 acres, falls within pebble plain habitat as currently defined. 6-1

2. We are concerned that the project will result in increased use and unplanned trail formation on NFS land to the north of the project, which supports pebble plains and other sensitive habitat. Under 'On-Site Recreation' on page 5.2-1, the DEIR states that the "site provides access to the San Bernardino National Forest to the north." However, mitigation measure 5.8-2c states that signs will be posted along the National Forest boundary "directing people to keep out..." We have found such signage to be ineffective in protecting sensitive areas while also providing a negative message to our visiting public. Therefore, we believe measure 5.8-2c will not effectively reduce potentially significant impacts to adjacent NFS lands and special status biological resources. 6-2

3. We are concerned about the conservation of bald eagle habitat in Big Bear Valley. As a federal land management agency, we are obligated to utilize our authorities to conserve bald eagles and other listed threatened and endangered species. Habitat loss along the Big Bear Lakeshore caused by developments such as the proposed project has become a significant cumulative impact to bald eagles as applied to management of NFS lands, thereby constraining our abilities to provide for public uses. We encourage the County to consider such effects beyond the Moon Camp property boundary when contemplating overriding considerations of significant impacts. 6-3

4. Under 'Public Access' on page 5.2-5, the DEIR states that the Forest Service has no plans to extend the Alpine Pedal Path through the project area. While there is no plan to do so currently, the SBNF has a longer term objective to extend the Pedal Path west through the Fawnskin area to NFS land near the Gray's peak trailhead and/or the Grout Bay picnic area. The project as proposed would foreclose potential routes to this end. We encourage the county to consider incorporating into the proposed project a public access path that could tie in to an extended Pedal Path on the east and the proposed Marina Point public lake access path on the west. 6-4

5. Mitigation measure 5.3-1c states that the required fuel modification zones will extend beyond property boundaries, including on to NFS lands. The SBNF would not support the issuance of such permits or easements and recommend that that project be designed to provide required fuel modification zones within the subject property. While the SBNF intends to treat NFS lands along the boundary with the community of Fawnskin to reduce ground fuels and ladder fuels, this treatment is not intended to fully meet the required fuel modification zone for residential structures. It has been SBNF policy to encourage new developments adjacent to NFS lands to provide all necessary infrastructure, including fuel modification zones, water tanks, and secondary access roads, within the development itself. 6-5

We appreciate the opportunity to provide these comments. Please feel free to contact us for additional information on biological resources, fire and fuels management, or National Forest lands management in general. With any questions or comments, please contact Gar Abbas on my staff at (909) 382-2807.

Sincerely,

Allison Stewart

ALLISON L. STEWART
District Ranger

Response to Commentor No. 6
Allison L. Stewart, United States Department of Agriculture, San Bernardino Forest Service
May 14, 2004

6-1 The area designated open Jeffrey pine forest was identified according to topography, soil types, and plant species composition observed during focused surveys in 2002. According to the 2002 Pebble Plain Habitat Management Guide, a point system to qualify pebble plain habitat was developed. To qualify as a pebble plain a given area must possess enough indicator species to attain a score of four points. Strong indicator species, each worth two points, often occur on pebble plains and rarely occur off pebble plains. Weak indicator species, each worth one point, often occur on pebble plains and frequently occur off pebble plains. The project site contains one strong indicator species, silver-haired ivesia, which was restricted to the 0.62 acre of pebble plain habitat mapped on Exhibit 5.8-3 of the EIR. Two weak indicator species, Parish's rock-cress and ash-gray Indian paint brush, were observed within the mapped pebble plain habitat and in scattered patches within the open Jeffrey pine habitat type. Therefore, the 0.62 acres of pebble plain attained the required four points and the area designated open Jeffrey pine forest attained only two points according to the 2002 Pebble Plain Habitat Management Guide point system. Implementation of Mitigation Measure 5.8-1a would ensure that botanical surveys are repeated prior to clearing or grading during a year of at least 40 percent average rainfall to more precisely map the concentration of special status plants and habitats. Following surveys, the habitat types and acreages will be revised according to the habitat definitions in the 2002 Pebble Plain Habitat Management Guide and mitigated appropriately at a 3:1 ratio. Please see the revisions to Mitigation Measure 5.8-1a in Response to Comment No. 3-5.

6-2 The proposed project would not provide access to National Forest Service (NFS) land to the north of the project site that is not already provided by existing roads (e.g., Flicker Road and Polique Canyon Road) and would not be expected to increase the human disturbance of surrounding areas by the general public. Since human disturbance would be expected to increase as a result of the proposed project, Mitigation Measure 5.8-2c was proposed to increase the awareness of the residents about the sensitive resources in surrounding areas. Mitigation Measure 5.8-2c has been revised in response to the concerns regarding the "negative message" to the visiting public.

Page 5.8-65, Mitigation Measure 5.8-2c of the Draft EIR has been revised in the Final EIR as follows:

5.8-2c	To limit the amount of human disturbance ~~to~~ on adjacent natural open space areas, signs shall be posted along the northeastern and eastern perimeter of the project site where the property boundary abuts open ~~space directing people to keep out of the adjacent natural open space areas and to keep dogs leashed in areas adjacent to natural open space areas. This requirement shall be published in the Homeowner Association CC&Rs~~ with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash

at all times."

In addition, a requirement stating that residents shall keep out of adjacent open space areas to the north with the exception of designated trails will be published in the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents.

6-3 The County will consider the Commentor's opinion and comments during their deliberation on the project.

6-4 The Forest Service has acknowledged that currently no plans have been prepared to extend the Alpine Pedal Path through the project area. However, the Forest Service does have a long-term objective to extend the Path west through Fawnskin to NFS land near the Gray's Peak trailhead and/or Grout Bay picnic area. As a result, the subsection pertaining to Public Access on Page 5.2-5 of the Draft EIR has been revised as follows:

PUBLIC ACCESS

5.2-2 *Implementation of the Moon Camp project would ~~not~~ affect public access along the north shore of Big Bear Lake. Mitigation requiring dedication of an easement along the south side of North Shore Drive has been incorporated. ~~The Project site is Private Property. Affects on public access are concluded as less than significant.~~*

The Moon Camp Project would include 31 residential/numbered lots south of the realignment of North Shore Drive. Additionally, the marina facilities, inclusive of Lot "C" would be located south of North Shore Drive. Lot "C", consisting of approximately 19,683 square feet (0.45 acres), would be the gated entrance to the marina facilities. Lot "C" would be situated between the "high water line" and the roadway improvements at the southwestern portion of the project site. The Lot "C" marina access ramp would affect public access from west to east along the shoreline of the Lake.

The County of San Bernardino General Plan Goal C-54 states the intention to "provide public access to all water bodies and water courses." Furthermore, Policy/Action OR-48 states that, "Because the County seeks to improve the ability of the public to enjoy water-related recreation, the County shall seek to improve public access to rivers, lakes, creeks, lakes and other bodies of water." Additionally, Policy/Action OR-49 states that "Because public access to water for recreational uses is important to the County, easements and dedications allowed in the Subdivision Map Act to acquire access to lakes, streams, public lands and other locally and regionally significant natural features shall be required for all new development." ~~However, since the Project site is private property, public access is not assured~~. As the project abuts existing homes to the east and the proposed Marina Point Development to the west, ~~P~~public access to the lakeshore would be maintained below the high water line of the lake.~~maintained at the eastern and~~

~~western boundaries of the site~~. Public access to the lakeshore also continues to be maintained at other locations along the perimeter of the lake. However, since the Project site is private property, public access is not assured.

~~It is further noted that~~ Although the U.S. Forest Service has indicated that there are no current plans to extend the Alpine Pedal Path through the project area, as a result of redesign of portions of the project area, south of North Shore Drive, a pedal path easement could be established. Thus, mitigation incorporating and easement has been incorporated for the project, to be conditioned, prior to recordation of a map. ~~Thus, it is concluded that access is provided to the lakeshore in close proximity to the project site resulting in a conclusion of less than significant impact.~~

In addition, Mitigation Measure 5.2-2, on Page 5.2-6 of the Draft EIR, has been revised in the Final EIR as follows:

5.2-2	~~No mitigation measures are recommended.~~ The proposed project shall be conditioned to incorporate a pedal path easement along the south side of North Shore Drive, prior to map recordation.

6-5 Commentor refers to lack of the SBNF lack of support for the proposed fuel modification zones. Please refer to Response to Comment No. 4-1, which addresses this concern.

Arnold
Schwarzenegger
Governor

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Jan Boel
Acting Director

RECEIVED
MAY 2004

May 14, 2004

Matthew Slowik
San Bernardino County Land Use Services Department
385 N. Arrowhead Ave., 1st Floor
San Bernardino, CA 92415-0182

Subject: Moon Camp
SCH#: 2002021105

Dear Matthew Slowik:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on May 13, 2004, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

7-1

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2002021105
Project Title Moon Camp
Lead Agency San Bernardino County Land Use Services Department

Type EIR Draft EIR
Description GPA/OLUD to establish a 95-lot residential subdivision, with 92 numbered lots and 3 lettered lots.

Lead Agency Contact

Name Matthew Slowik
Agency San Bernardino County Land Use Services Department
Phone 909-387-4147 **Fax**
email
Address 385 N. Arrowhead Ave., 1st Floor
City San Bernardino **State** CA **Zip** 92415-0182

Project Location

County San Bernardino
City
Region
Cross Streets Canyon Road and Polique Canyon Road
Parcel No. 0304-082-14, 0304-091-12, 13, 21
Township 2N **Range** 1W **Section** 13 **Base** SBBM

Proximity to:

Highways 38
Airports
Railways
Waterways Big Bear Lake
Schools
Land Use BV/RL-40 (Rural Living - 40 acre minimum lot size)

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Drainage/Absorption; Fiscal Impacts; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Sewer Capacity; Soil Erosion/Compaction/Grading; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Growth Inducing; Landuse; Cumulative Effects

Reviewing Agencies Resources Agency; Department of Fish and Game, Region 6; Department of Forestry and Fire Protection; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Office of Emergency Services; California Highway Patrol; Caltrans, District 8; Regional Water Quality Control Board, Region 8; Department of Toxic Substances Control; Native American Heritage Commission; State Lands Commission

Date Received 03/30/2004 **Start of Review** 03/30/2004 **End of Review** 05/13/2004

Note: Blanks in data fields result ufficient information provided by lead agency.

Response to Commentor No. 7
Terry Roberts, California Governor's Office of Planning and Research: State Clearinghouse and Planning Unit
May 14, 2004

7-1 The Commentor acknowledges that the Draft EIR has complied with State Clearinghouse review requirements and has been forwarded to select state agencies for review. No further response to this comment is necessary at this time.

Southern California
Gas Company
1981 W. Lugonia Avenue
Redlands, CA 92374-9720
Mailing Address:
PO Box 3003
Redlands, CA 92373-0306

RECEIVED
APR 2004

The Gas Company®

A Sempra Energy® utility

April 21, 2004

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Attention: Matthew W. Slowik

Re: (EIR) MOONCAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.

Thank you for the opportunity to respond to the above-referenced project. Please note that Southern California Gas Company has facilities in the area where the above named project is proposed. Gas service to the project could be provided without any significant impact on the environment. The service would be in accordance with the Company's policies and extension rules on file with the California Public Utilities Commission at the time contractual arrangements are made.

You should be aware that this letter is not to be interpreted as a contractual commitment to serve the proposed project, but only as an informational service. The availability of natural gas service, as set forth in this letter, is based upon present conditions of gas supply and regulatory policies. As a public utility, The Southern California Gas Company is under the jurisdiction of the California Public Utilities Commission. We can also be affected by actions of federal regulatory agencies. Should these agencies take any action, which affects gas supply, or the conditions under which service is available, gas service will be provided in accordance with revised conditions. 8-1

Typical demand use for:

a.	Residential	(System Area Average/Use Per Meter)	Yearly
	Single Family		799 therms/year dwelling unit
	Multi-Family 4 or less units		482 therms/year dwelling unit
	Multi-Family 5 or more units		483 therms/year dwelling unit

These averages are based on total gas consumption in residential units served by Southern California Gas Company, and it should not be implied that any particular home, apartment or tract of homes will use these amounts of energy.

b. Commercial

Due to the fact that construction varies so widely (a glass building vs. a heavily insulated building) and there is such a wide variation in types of materials and, a typical demand figure is not available for this type of construction. Calculations would need to be made after the building has been designed. 8-1

We have Demand Side Management programs available to commercial/industrial customers to provide assistance in selecting the most effective applications of energy of our energy conservation programs, please contact our Commercial/Industrial Support Center at 1-800-GAS-2000.

Sincerely,

Rogelio A. Rawlins
Technical Services Supervisor

Response to Commentor No. 8
Rogelio A. Rawlins, The Gas Company
April 21, 2004

8-1 The Commentor acknowledges that gas service to the project could be provided without any significant impact to the environment. No further response to this comment is necessary at this time.

COMMENT NO. 9

Friends of Fawnskin

PO Box 422, Fawnskin, CA92333
Phone: 909-866-9682
FriendsofFawnskin@Yahoo.com

10 May 2004

VIA FAX (909-387-3223) AND U.S. MAIL

Mr. Matthew W. Slowik
County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Mr. Slowik,

I am writing to request that the County extend the May 17 deadline for public responses to the DEIR for the Moon Camp Development Project. The DEIR is a huge document, difficult to read and requires extensive time to evaluate properly There are many very complex impacts presented and a long list of documents and reports referred to in the DEIR but not provided. We are spending a great deal of extra time finding and reviewing the information in these other documents, plus locating information on issues that were omitted from the DEIR. 9-1

Thank you for your consideration in this request. I look forward to hearing from you.

Sincerely,

Janet T. Davidson

a friend

Board of Directors
Norman Silberfeld (Chair)
Robert Drake (Chair)
Tom Brandau
Tom Brickley
Barbara Finlayson-Pitts
Buffy Francuz
Joe Francuz
Bill Hazewinkel
Peter Jorris
Patricia Klous
Jim McGrew
Todd Murphy
Fry Nichols
Jim Pitts
Paul Schuh
Sandy Steers
Peter Tennyson

Response to Commentor No. 9
Janet Davidson, Friends of Fawnskin
May 10, 2004

9-1 County Staff is not formally extending the public review period, which started on March 30, 2004 and ended on May 13, 2004. The California Environmental Quality Act (CEQA) requires a 45-day public review period for a project of this nature.

The Commentor is also referred to Section 15207 of the CEQA Guidelines which states that:

> *"If any public agency or person who is consulted with regard to an EIR or negative declaration fails to comment within a reasonable time as specified by the lead agency, it shall be assumed, absent a request for a specific extension of time, that such agency or person has no comment to make. Although the lead agency need not respond to late comments, the lead agency may choose to respond to them."*

Although the public review period ended on May 13, 2004, the County did accept comment letters received after this date, as late as July 2, 2004, to which responses are provided.

Friends of Fawnskin

PO Box 422, Fawnskin, CA92333
Phone: 909-866-9682
FriendsofFawnskin@Yahoo.com

10 May 2004

VIA FAX (909-387-3223) AND U.S. MAIL

Mr. Matthew W. Slowik
County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Mr. Slowik,

I am writing to request that the County extend the May 17 deadline for public responses to the DEIR for the Moon Camp Development Project. The DEIR is a huge document, difficult to read and requires extensive time to evaluate properly. There are many very complex impacts presented and a long list of documents and reports referred to in the DEIR but not provided. We are spending a great deal of extra time finding and reviewing the information in these other documents, plus locating information on issues that were omitted from the DEIR. 10-1

Thank you for your consideration in this request. I look forward to hearing from you.

Sincerely,

Sandy Steers
for the Friends of Fawnskin

[redacted]
Roxanne Silberfeld (Chair)
Robert Drake (Chair)
Tom Brandau
Tom Brickley

Barbara Finlayson-Pitts
Buffy Francuz
Joe Francuz
Bill Hazewinkel
Peter Jarris

Patricia Kloss
Jim McGrew
Todd Murphy
Erv Nichols
Jim Pitts

Paul Schuh
Sandy Steers
Peter Tennyson

Response to Commentor No. 10
Sandy Steers, Friends of Fawnskin
May 10, 2004

10-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

CENTER FOR BIOLOGICAL DIVERSITY

CALIFORNIA AND PACIFIC OFFICE

protecting and restoring natural ecosystems and imperiled species through science, education, policy, and environmental law

VIA FACSIMILE AND U.S. MAIL

May 11, 2004

Mr. Matt Slowik, Senior Associate Planner
County of San Bernardino
385 N. Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182
Facsimile: (909) 387-3223

Re: Request for Extension of Time to Prepare Comments on the Draft Environmental Impact Report for the Moon Camp Residential Subdivision Tentative Tract No. 16136, SCH # 2002021105

Dear Mr. Slowik,

I write on behalf of the Center for Biological Diversity ("the Center") to request an extension of time to submit comments on the Draft Environmental Impact Report for the Moon Camp Residential Subdivision Tentative Tract No. 16136, SCH # 2002021105 ("Moon Camp DEIR"). The Center is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 9,000 members throughout California and the western United States, including in County of San Bernardino where the project is located. 11-1

The Moon Camp proposal is an extremely significant development proposal which will have grave environmental consequences, for example with regard to the bald eagle, a species listed as threatened under the federal Endangered Species Act, endangered under the California Endangered Species Act, and Fully Protected by the state of California. The Moon Camp DEIR consists of two large volumes that deal with a detailed and technical subject matter. Due to the importance of the environmental issues and the volume of documents to be reviewed, an extension of four weeks, to June 14, 2003, is warranted in this instance. Such an extension would give the Center and other organizations and individuals a fuller opportunity to prepare comments that should prove useful to the County in its review of this project.

Tucson • Phoenix • Silver City • San Diego • Berkeley • Shaw Island

Kassie Siegel, Staff Attorney
PO Box493, Idyllwild, CA 92549
TEL.: (909) 659-6053 x. 302 • FAX: (909) 659-2484
Email: ksiegel@biologicaldiversity.org • www.biologicaldiversity.org

Please notify me by phone at (909) 659-6053 x. 302 or by fax at (909) 659-2484 or by U.S. mail to the address on this letterhead as to whether the County will grant the requested extension of time. Thank you very much for your consideration of this very important matter. 11-1

Sincerely,

Kassie Siegel
Center for Biological Diversity

Response to Commentor No. 11
Kassie Siegel, Center for Biological Diversity
May 11, 2004

11-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern. Commentor also refers to impacts to the bald eagle. Please refer to Response to Comment Nos. 3-7, 13-88, 13-95 and 41-14, which address these concerns.

FRIENDS OF FAWNSKIN
P.O. Box 422
Fawnskin, California 92333
909-866-9682

RECEIVED
MAY 1 2004

May 11, 2004

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Avenue 1st Floor
San Bernardino, California 92415-0182

Attn: Matthew Slowik, Sr. Assoc. Planner

BY FAX & U.S. MAIL: 909-387-3223

RE: "DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK."

Dear Mr. Slowik,

Due to the length and complexities of this DEIR we would like to request more time to respond and comment. It is an important but necessary task to research and substantiate our comments, and to do so properly and accurately, more time is needed. 12-1

Thank you for your consideration.

Yours truly,

Thomas Brandau
For Friends Of Fawnskin Adv. Committee

Response to Commentor No. 12
Thomas Brandau, Friends of Fawnskin
May 11, 2004

12-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

RECEIVED
MAY 17 2004
LAND USE SERVICES DEPT.
PLANNING DIVISION

FRIENDS OF FAWNSKIN
P.O. Box 422
Fawnskin, California 92333
909-866-9682

May 15, 2004

HAND DELIVERED

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Avenue 1st Floor
San Bernardino, California 92415-0182

Attn: Matthew Slowik, Sr. Assoc. Planner

RE: "DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK."

I. INTRODUCTION and SUMMARY

On behalf of the membership of Friends Of Fawnskin we would like to thank the San Bernardino County Land Use Services Department Planning Division for the opportunity to comment on the Draft Environmental Impact Report for the proposed Moon Camp residential development project, General Plan amendment, land use district change, circulation amendment, tentative tract map and conditional use permit for a boat dock (collectively, DEIR). Friends Of Fawnskin (FOF) represents a membership of over 600 local residents of Fawnskin, California, all of whom would be directly and adversely affected by the development of the proposed Moon Camp project. FOF has been working consistently to maintain and protect the historic small-town, nature-oriented atmosphere of Fawnskin on the north shore of Big Bear Lake. Residents and visitors who have chosen to come to Fawnskin have done so primarily because of the current character of the town. We feel that it is imperative to the rights of these individuals that the basic essence of this character be preserved. 13-1

The FOF is strongly opposed to this proposed Moon Camp development project because this project, as proposed, would have extensive adverse effects on surrounding properties, on the entire community of Fawnskin and on the Big Bear Valley as a whole. The FOF urges the County not to allow the significant impacts and multiple harmful effects that would occur should this proposed project be approved. We support the RL-40 designation of this property as it is currently zoned in the County's General Plan and strongly advocate the maintenance of this designation.

In reviewing the DEIR, the FOF has found it to be incomplete, inaccurate, and defective. The DEIR fails to adequately evaluate the severe adverse effects of the proposed project and grossly downplays and understates the significant and unavoidable impacts that would be caused should it be approved. FOF's objections to this proposed project and the inadequacies of this DEIR are set forth below. Please include this letter in its entirety as part of our formal CEQA comments to be

included in the Environmental Impact Report. In summary, we object to this development project, as proposed, for the following reasons: 13-1

II. GENERAL PROCEDURAL COMMENTS

- The DEIR Cumulative Analysis in all areas fails to adequately assess the cumulative effect of the subject project in the context of other past, present and proposed future projects. Section 4.0 omits two large projects—the Castle Glen development in Big Bear Lake and the tripling in size of the Big Bear Discovery Center to accommodate increased tourist traffic. Those, plus the ones listed (Cedar Dell, Marina Point and proposed moving of the Zoo—all in Fawnskin) add extensively to the already significant cumulative impacts of this proposed project on Fawnskin, the North Shore and the Big Bear Valley. In addition, two other parcels (one 30 acres and one 7.5 acres) very near the Moon Camp property are in the early stages of proposed development. And the cumulative impact of all the combined projects is underestimated and downplayed throughout every section of the document. 13-2

- The DEIR fails to consider that there is still no defined water supply for the site and as such, according to current **state law, this proposed project absolutely cannot be approved**. (Our comments under the section on water present details on this.) 13-3

- The DEIR in all sections fails to define how each mitigation item will be implemented and who would be accountable for the implementation of these measures. It also fails to mention who will monitor and enforce proposed mitigation. Without the specific and enforceable details, such mitigations cannot credibly or verifiably reduce the level of significant impacts. 13-4

- The DEIR analysis failed to consider input from California Department of Transportation (necessary to give input to the rerouting of the scenic highway), the United States Forest Service (the proposed development is adjacent on the north and east to the USFS which has needs to address eagle and biological concerns), the California Department of Fish and Game (input necessary for shoreline and streambed areas), the Army Corps of Engineers (input necessary for dredging to deepen a site for boat docks), and the Big Bear Lake Municipal Water District (input necessary for dredging and the marina). 13-5

- The DEIR fails to consider the "No Project/No Development" and the "No Project/ Existing Designation" Alternatives as viable alternatives in Section 7.5 and fails to state specifically which is the "Environmentally Superior" option. 13-6

- The DEIR fails to analyze the impacts that would be caused by the increasing percentage of full-time use of the homes, when across the mountains, more and more homeowners are moving full-time to their mountain retreat (with Crestline now up to 70% full time and climbing rapidly). The impact of full occupancy of the 92 proposed houses must be evaluated in each area of the analysis. 13-7

For each of the above reasons, and for the reasons that follow, the DEIR should be rejected.

III. LAND USE and RELEVANT PLANNING

- In Section 5.1.1 the DEIR fails to reference or consult the valuable study mandated in General Plan Ordinance OR-3-d. "Prepare a report outlining the economic effects of open space, focusing on potential tourism revenues, the effect of open space on adjacent property values and the relative costs of providing open space management or urban services for a site." Since this property is now open space and since the current zoning serves to leave it in primarily an open space state, this study must be completed. 13-8

- In section 5.1-2, the DEIR states that according to the General Plan, a Land Use District Change requires that: "The proposed land use District change is in the public interest, there will be a community benefit, and other existing and permitted uses will not be compromised." This proposed zoning change is absolutely not in the public interest and would have substantial adverse effects on the community. These adverse effects would include a dramatic change in the size and character of the Community of Fawnskin, water, views, etc. The most critical of these adverse effects would be the resulting threats to public safety and public health. In addition, the existing use of a large portion of open space, which has been shown in studies to have significant tangible value, would be compromised with the proposed zoning change. The proposed change would obstruct public lake views from the highway in one of the few places remaining where the public can view the lake from the highway, and views from the lake and south shore of the scenic North Shore. 13-9

- In section 5.1-2, the DEIR states that according to the General Plan, a Land Use District Change requires that: "The proposed land use District change is consistent with the goals and policies of the General Plan, and will provide a reasonable and logical extension of the existing land use pattern in the surrounding area. " The proposed zoning change would not be a logical extension of the existing land use pattern. Since only about 42% of the properties boundaries are homes, this is not at all a logical extension of the land use pattern. A "logical extension" following the argument used in the DEIR would be for this property to be made available for public use and enjoyment, as is the majority of the property surrounding it. (58% of the properties boundaries are National Forest and lake, all public open space.) 13-10

- In section 5.1-2, the DEIR states that according to the General Plan, a Land Use District Change requires that: "The proposed land use District change does not conflict with provisions of this Code, or any applicable specific code." This proposed zoning change conflicts with the County's General Plan Code C-56 "Restrict development along scenic corridors." This proposed change would serve to increase rather than restrict development along a designated scenic highway. 13-11

- In section 5.1-2, the DEIR states that according to the General Plan, a Land Use District Change requires that: "The proposed land use District change does not conflict with provisions of this Code, or any applicable specific code." This proposed zoning change conflicts with the County's General Plan Code C-55 "Preserve and protect outstanding scenic resources of San Bernardino County for their continued future enjoyment." This proposed change would serve to degrade, not protect the outstanding scenic resources of this area. 13-12

- In section 5.1-2, the DEIR states that according to the General Plan, a Land Use District Change requires that: "The proposed land use District change does not conflict with provisions of this Code, or any applicable specific code." This proposed zoning change conflicts with the County's General Plan Code OR-59 "Because public health and safety can be protected through the use 13-13

of open space, the County may maintain open space where flood, *fire*, geologic, seismic hazards, noise or other conditions endanger public health and safety." This proposed change would pose a substantial risk to the protection of the public's health and safety by reducing the supply of water available for fighting fire and increasing the number of people that would need to be evacuated from Fawnskin in the event of wildfire threatening the community. It would also increase the ratio of structures to wildland in this urban/wildland interface, which fire fighters recognize as the most difficult and costly to defend, while this area is already under a State Emergency Proclamation. This change would therefore be contrary to this ordinance and irresponsible on the part of the County. 13-13

- In section 5.1-2, the DEIR states that according to the General Plan, a Land Use District Change requires that: "The proposed land use District change does not conflict with provisions of this Code, or any applicable specific code." This proposed zoning change would conflict with the County's General Plan Code D-51 "Ensure that the quality of life of County residents is not depreciated by future growth." This proposed changes would in fact serve only to depreciate the quality of life of the surrounding Fawnskin residents, as well as County residents throughout Big Bear Valley by allowing for future development of this property, with attendant traffic, pollution discharge and other detrimental effects. 13-14

- In section 5.1-2, San Bernardino County Development Code, the DEIR states that according to the General Plan, a Land Use District Change requires that: "The proposed land use District change does not conflict with provisions of this Code, or any applicable specific code." This proposed zoning change conflicts with the County's General Plan Code in Section III C, Mountain Region, "The physical/natural constraints of the region and the lack of adequate water supply and infrastructure facilities needed to support higher density development preclude higher intensity uses." Since the General Plan wisely saw fit to zone this property RL-40 to preclude higher density uses, this proposed change is in direct conflict with the General Plan. 13-15

- In section 5.1-2, the DEIR states that according to the General Plan, a Land Use District Change requires that: "The proposed land use District change will not have a substantial adverse effect on surrounding property." The proposed zoning change in fact would have a substantial adverse effect on the surrounding property, by increasing public health and public safety risks and by substantially blocking views and decreasing property values. Existing property owners of surrounding properties bought their property and homes with the knowledge that this Moon Camp property was zoned RL-40 and the property rights of all these individuals must be protected by the County. 13-16

- The proposed project would not satisfy any of the requirements stated in the General Plan for allowing a zoning change. Therefore, the DEIR statements are false and the DEIR failed to adequately assess the collective or combined effect of both the project in question and other foreseeable projects. See Kings County Farm Bureau v. City of Hanford, 221 Cal.App. 3d 692. 13-17

- The DEIR states in Section 5.1-3 that this proposed project, combined with other future development, would increase the intensity of land uses in the area, but concludes that the impacts are less than significant. This is an erroneous conclusion. The direct and cumulative effects of this proposed zoning change in total with the proposed Marina Point development project, the proposed Brookside development project, the expansion of the Discovery Center and 13-18

the other projects currently in development in Big Bear Valley would cause a significant and unavoidable impact to Fawnskin and the surrounding communities. 13-18

- The proposed zoning change would have the potential to increase the population of the Community of Fawnskin by at least 34%. Such a substantial increase in the size of a community has a multitude of adverse impacts on the infrastructure and the character of the area and would be a significant and unmitigable impact. 13-19

- In section 5.1-2, San Bernardino County Development Code, the DEIR states that according to the General Plan, a Land Use District Change requires that: "The proposed land use District change does not conflict with provisions of this Code, or any applicable specific code." This proposed zoning change conflicts with the Land Use Element policy, which the DEIR states is "relevant to the proposed Project." This policy, LU-2, states that one of the actions that shall be implemented is "(a) Require that the design and siting of new residential development meet locational and development standards that ensure compatibility with adjacent land uses and community character." The proposed project is designed as a suburban residential tract with cul-de-sacs, street lighting, curbs, etc, which in no way matches the surrounding unique historic small town community. Thus, the associated proposed zoning change once again conflicts with the County's code and therefore cannot be allowed. 13-20

- In section 5.1 and Table 5.1-1, the DEIR states that the surrounding residential property is Improvement Level-1, but the surrounding properties in reality have Improvement Level-3 – there are no curbs and gutters, there are no sidewalks, there is nearly no street lighting at all. Nowhere in Fawnskin do any of the residential areas match the "high density development in urban areas" as specified by IL-1. Allowing the development of this proposed project at an IL-1 level is completely out of character with the rural, mountain character of the existing community and would be a significant unmitigable impact. 13-21

- Section 5.1 in the DEIR states that in the amendment to the Transportation/Circulations Maps with the changing in alignment of State Route 38, a less that significant impact would occur. Considering that this is a County designated Scenic Highway and that the views from this Scenic Highway would be completely lost and replaced with a view of the wall of a gated community, this analysis is invalid and this change would create a significant and unavoidable impact. 13-22

In summary, the DEIR statement that "No unavoidable significant impacts related to Land Use and Relevant Planning have been identified" only emphasizes the inadequacy of this DEIR. For all of the reasons stated above, there are many **significant and unavoidable impacts related to Land Use and Relevant Planning.** For the potential increases in public safety and public health risks alone, it would be completely irresponsible of the County to approve the proposed zoning change. 13-23

IV. RECREATION

- Section 5.2-1, Expansion and/or construction of Recreational Facilities, of the DEIR states on page 5.2-4 that the proposed construction of marina facilities may have an adverse impact on the physical environment, but that these potential impacts are concluded to be less than significant. This analysis is invalid and the impacts have been significantly understated since 1) construction of these facilities would require dredging of the lake in shallow-water bald eagle 13-24

foraging habitat, and 2) since no analysis has been done on storage of boats during the seven months of the year when they are not in use and since the use of these facilities with residents pulling boats and trailers in and out of the facility has not been accounted for in the traffic study. The permanent impact of additional traffic on the lake, with related noise, fuel emissions and loss of space on the lake for fishing and boating activities due to entrance and exit traffice has not been addressed. 13-24

- Section 5.2-1 of the DEIR bases all calculations on a weekend use factor of 9%, which is the yearly average. This use is actually seasonal and is closer to 60% during summer weekends, with 90% expected on holiday weekends. The impacts these proposed facilities would have has been underestimated, making the analysis invalid. 13-25

- In section 5.2-2 of the DEIR statement that "Public access to the lakeshore would be maintained at the eastern and western boundaries of the site" is erroneous since the proposed project maps and plans show no public access corridors designated and since the lakefront portion of the proposed project would abut to existing homes on the east and to the proposed Marina Point development project on the west. The DEIR also failed to consider that all land below the high water line of Big Bear Lake is open to public access. Even if this land remains technically open, the perception that the land is private will be created by the adjacent gated community, and access to this public resource will inevitably be restricted. 13-26

V. PUBLIC SERVICES AND UTILITIES

A. Fire Protection

- Under Section 5.3, the analysis of Fire Protection is based on Fire Risk level 2, but all mountains areas in the County have been upgraded to Fire Risk level 1. This makes the DEIR's entire analysis of Fire Protection invalid. 13-27

- Section 5.3.1a states that "The fire flow requirement shall be 1750 gpm @ 2 hours based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm @ 2 hours for homes greater than 4,800 square feet" when nowhere in the DEIR does it explain where this water capacity will come from nor even that the findings are supported by County Fire. 13-28

- The DEIR in no way justifies how the fire sprinklers specified in Section 5.3.1b are an equivalent tradeoff for additional manpower. Especially in cases of forest fires, internal sprinklers would do nothing to stop the trees and brush around the homes from burning and spreading the fires. This mitigation completely underestimates the issue of fire risk in the mountains and ignores the risk created by additional sources of fire, such as chimneys, barbecues and potential traffic accidents or utility failures. 13-29

- Section 5.3-1c says that the fuel modification would not terminate at the property line, but nowhere in the DEIR is there an analysis of the likelihood of obtaining a permit from the U.S. Forest Service (and in fact, they were not even contacted during the analysis), so this mitigation has no merits unless the 100-foot fuel modification requirement is to be contained completely within the project boundaries. 13-30

- The mitigations listed in 5.3-1e and 5.3-1f are based on homeowners complying with HOA standards and offer no plan for enforcement. This is completely impractical and these mitigations do not reduce significance. 13-31

- The DEIR does not address Fire Evacuation plans for the area, so nothing was included in section 5.3-1 regarding the cumulative impact more houses will have on fire evacuations from Fawnskin and Big Bear Valley. In the October 2003 wildfire evacuation, with a few days of warning and with minimal tourists in the area, it still took 6 hours to get off the mountain. No analysis was done on the impact increasing the size and population of Fawnskin by 34% will have on fire evacuations, especially should a forest fire start in the Valley or near Fawnskin. A further analysis is required, which considers the situation in which access to either highway 18 or Highway 38 is impaired due to the location of a fire. 13-32

- 90% of all County (Fawnskin) Fire Department calls are for medical aide. The DEIR does not address what the cumulative impact of this additional proposed development will have on the local station (Station 49) regarding medical aide. 13-33

- No analysis was done on the how the additional homes of the proposed development would increase the urban/forest interface in Fawnskin and how much the fire risk will increase accordingly. 13-34

- The impact on fire risk from fuel storage and fuel spills at the proposed marina, and from fuel tanks on boats stored or parked at the proposed private marina have not been evaluated in the DEIR. 13-35

- The Insurance Service Organization (ISO) has stated that Fawnskin is in a high fire danger area (9 on a 1-10 basis). The EIR does not evaluate whether adding additional homes will increase the likelihood of fire insurance becoming unavailable for the Fawnskin residents and especially for second homeowners who already have a challenge in obtaining fire coverage. 13-36

For the reasons given above, the DEIR is incomplete, inaccurate, and defective in its analysis of fire protection and the development of the proposed project would clearly create **significant and unmitigable impacts to Fire Protection.** 13-37

B. Police Protection

- Section 5.3-2 uses the average response time for emergency calls to the entire unincorporated area is invalid – only average times to the Fawnskin area should be used due to its distance from the Sheriff's station compared with other unincorporated areas. This analysis should be required to address response time on summer and holiday weekends, the more likely time the proposed project will be most densely used. 13-38

- Section 5.3-2 uses the number of calls handled for the entire unincorporated area and not for calls within Fawnskin, nor does it evaluate the increase in calls to Fawnskin expected with an increase of 34% in Fawnskin's population that would be likely occur with the development of this proposed project. There is currently one officer for the entire area and police services are spotty at best and often non-existent. 13-39

- No analysis was done in the DEIR on police response times and abilities for "other than emergency" calls. 13-40

The conclusion that the impact police protection is less than significant is based on irrelevant and insufficient data. 13-41

C. Water

Although the DEIR does state that the water issue cannot be mitigated to below the level of significance, the analysis that is offered grossly understates the current water crisis.

- Section 5.3-6 incorrectly states that this proposed project is exempt from SB221 (which states adequacy of water supplies for the proposed project must be determined). As the DEIR points out, SB221 applies to any subdivision that increases connections by 10% or more. Since Fawnskin is actually a separate water system (we do not have water lines coming from the City of Big Bear Lake) and independent from the rest of the DWP's service area and the rest of the Valley it must be considered separately in the calculations. There are currently 673 connections in Fawnskin, 92 additional connections would be a 14% increase, so SB221 does apply. 13-42

- Section 5.3-6 bases potential water supply on 2 wells (FP-2 and FP-3) drilled on the property in 1987 and any assumption for potential water supply from these wells is inaccurate without further study. According to the Big Bear Lake Municipal Water District's Watermaster report (which was not utilized as reference material in the DEIR analysis) the average rainfall over the past 5 years compared to the 5 years prior to 1987 was 37% less at the dam and 51% less at the Big Bear Lake Fire Department. Without the presentation of this information and an associated analysis and evaluate of the potential well production, the DEIR is incomplete and inaccurate and understates the level of significance of the impact of this proposed project on water service. 13-43

- Section 5.3-6 fails to address the high potential for mineral contamination of the wells that were drilled in 1987. Many wells around the Valley are highly contaminated with fluoride, iron and other minerals and must be mixed with other water containing less minerals before it can be used. The DEIR does no evaluation of the potential mixing water requirements. 13-44

- Mitigation measure 5.3-6a states that water supply has to be proven prior to building permits. Given the current drought conditions in Fawnskin (and the mountains in general), with rate increases and water restrictions already in place, the County would be derelict in its duties of protecting the public health and resources available to current residents if it did not require **the water supply to be proven prior to approving any change in zoning and prior to approving this (or any) proposed development project.** 13-45

- Construction water has not been addressed in the DEIR. For construction work that would take place during the summer, which would be all work since the DEIR offers a mitigation measure in section 5.8-1g that prohibits exterior construction between December 1 and April 1 of each year, there would be a significant amount of water used. Although there are current requirements that construction water come from reclaimed sources, these requirements are routinely violated. The DEIR is incomplete in not addressing this impact. As a mitigation measure, the project sponsor should be required to pay for additional enforcement resources dedicated to the immediate area. 13-46

- The mitigations listed in Section 5.3-6d regarding landscape and outdoor watering are completely inadequate and illusionary. The mitigations listed are based on DWP's Stage 1 water restrictions, while we have already moved to Stage 2 water restrictions and DWP has announced that we could be moving to Stage 3 water restrictions before the end of summer. In addition, there is no information regarding how these mitigations would be enforced and current experience shows that the existing water usage restrictions already in force throughout the Valley are not being followed nor enforced. 13-47

- There is no analysis in the DEIR that takes into account the effect to the proposed water supply caused by of private wells recently dug in Fawnskin, so the water analysis once again is completely inadequate and understates the significant impact this proposed project would have on water service and availability. 13-48

D. Electricity

- Section 5.3-9 states that project implementation would result in an increased demand for electricity, but that impacts would be less than significant. We are currently facing increased rates to pay for system upgrades that Bear Valley Electric (BVE) is building, and this additional capacity is only calculated to handle peak period overloads. BVE says no more electricity can be brought up the hill, and we are already facing short supplies, so ANY additional development, including this proposed project, would create significant and unavoidable impacts on electricity service capabilities throughout Big Bear Valley. 13-49

- Section 5.3-9 states that an alternative for providing power to this proposed project would be to place a power source at the site. This alternative is totally unacceptable due to the extensive additional adverse impacts it would have on the community and environment in terms of noise, reduction in air quality, and harm to wildlife at a minimum, and none of these impacts were discussed or analyzed in the DEIR. 13-50

VI. Aesthetics/Light and Glare

Even though the DEIR states that there would be a significant and unavoidable impact that cannot be mitigated for the view areas on all sides of the proposed project, the DEIR analysis greatly understates and downplays the level of significance of the impacts regarding Aesthetics, Viewsheds, Light and Glare. 13-51

- Section 5.4 of the DEIR failed to consider the requirements of the San Bernardino County Light Ordinance, which has been adopted by CSA 53B, in who's area the proposed project is located. 13-52

- From the DEIR: "Implementation of the Moon Camp project would adversely impact scenic resources, scenic vistas and the visual character of the site and its surroundings. Analysis has concluded that a significant and unavoidable impact to the visual character and viewshed from the project site and surrounding areas would occur which cannot be mitigated to a less than significant level." The mitigation measures that follow are more a sales pitch and sugar-coating 13-53

for the proposed development than meaningful measures to correct or reduce the acknowledged impacts." 13-53

- The simulated views in Section 5.4 do not include the housing density that is proposed and they are not done to the correct scale. In addition, by choosing to show the views from an angle toward the east, the angle used seriously misleads as to how the view will appear from the houses above the proposed project. All of this serves to grossly understate the impacts this proposed project would have on the overall views. 13-54

- The views used in Section 5.4 show an exceptional number of full-grown trees (between and near the homes) when in actual construction it would be highly unlikely that these trees would survive and new trees would take 50-100 years to grow to that size. This downplays, distorts and misrepresents the overall impacts the proposed project would have. 13-55

- The DEIR in section 5.4 fails to consider the visual impact of a 100-boat marina and the cumulative visual impact of the adjoining proposed Marina Point 175-boat marina, nor does it makes plans for nor account for the visual impact of parking for usage of this proposed marina. 13-56

- The DEIR does not address off-site storage locations for the 100 boats and trailers associated with the proposed marina, nor does it include any mitigations to keep them from being stored at each of the homes, thus increasing the level of significance of the impacts of this proposed project to the aesthetics. 13-57

VII. Traffic and Circulation

The analysis of traffic and circulation in the DEIR is inadequate because it is based on false assumptions:

- The "project" and "baseline" traffic analysis in the DEIR is based on the constant growth rate of traffic over the past 10 years. This is not accurate, given the accelerating growth in Southern California, and particularly in San Bernardino and Riverside Counties. The growth rate within Big Bear Valley itself (as stated in the DEIR in section 6.3) shows that the annual average in population growth from in the 2 years 2000-2002 is 14 times the annual average from 1990-2000 and the annual average in number of houses built from 2000-2002 is over 8 times the annual average from 1990-2000. 13-58

- The DEIR also assumes that peak hour traffic in the area is the "standard" AM and PM peaks. Given the mix of residential and recreational traffic, it is not clear as to when the peak period actually is. 13-59

- In the intersection analysis (both the ICU and delay), the DEIR uses values of lane capacity that, although acceptable under ideal dry weather conditions, would be wildly optimistic (and practically unachievable) under snowy or slick road conditions. If a peak month is during the winter tourist season, the whole traffic analysis is in error, and grossly underestimates the negative impact generated by the proposed development. The analysis as it now stands assumes an intersection capacity based on the most ideal conditions (e.g., dry weather, 12-ft lane widths, no parking, fairly aggressive driving, perfect visibility, etc.) Both the existing level of 13-60

service (LOS) and negative impacts would be exacerbated if these conditions are not fully met; for example, recalculation of existing LOS using a reduced capacity might move some of the intersection approaches into a LOS category that has a different (*i.e.* lower) threshold for being designated as "significantly impacted." Also, such proposed mitigation measures as widening approaches might be rendered totally ineffectual if, for example, plowing only provides a limited travelway. 13-60

- Section 5.5.31: The DEIR failed to state why the developer is only paying a pro-rata share of a traffic signal at the Stanfield Cutoff. If this proposed project causes the impact, it should bear the full cost. Also, if traffic impacts from this proposed project are significant enough to require a signal at Standfield Cutoff, then the DEIR does not support its own conclusion that there is no significant impact to Fawnskin from this traffic. 13-61

- The DEIR does not consider alternate routes since all exits from the 92 residential sites funnel into a two-lane highway (Route 38), along with 134 sites at the adjacent proposed Marina Point development. 13-62

- The DEIR failed to correctly consider the impact that straightening Route 38 will create. A straightened Route 38 will become the "Gateway" to the Big Bear Valley; the most direct route to Stanfield Cutoff, the valley's central crossing, and will become the route of choice for all commercial traffic. This negates all traffic figures, trips, and volume studies assumed by the DEIR. By not considering this impact the DEIR analysis is completely inadequate and invalid. 13-63

- The DEIR does not take into account CalTrans information that Route 38 currently has a poor (congested) rating, and cannot adequately support the increased traffic ninety-two more homes and a marina would bring. 13-64

- The DEIR does not address the potential for an increase in accidents and traffic jams at both ends of the proposed straightened portion of State Route 38. Straightening this portion of the highway would substantially increase the average speed of traffic through this section, but curved portions of the roadway would still remain at both ends of this straight section, causing traffic to make sudden and hazardous reductions in speed. 13-65

Given all of the above information, the development of the proposed project **with or without the straightening of the highway** would cause **significant and unmitigable impacts regarding traffic and circulation** in the area. 13-66

VIII. Air Quality

- The DEIR fails to include either dispersion or photochemical modeling to predict the impact of the project on the concentrations of pollutants that will actually occur in the air in Big Bear Valley, nor the formation of toxic *secondary* pollutants *formed* by chemical reactions in air, e.g. ozone. It simply uses an emissions model to calculate the number of pounds per day of *primary* pollutants that will be emitted *directly* by the project, and compares these to regional threshold values given in South Coast Air Management District (SCAMD) "look-up tables". 13-67

- The DEIR fails to address emissions of three important air pollutants: SO_x, lead, and toxic air contaminants (TACs). In the latter case for example, the threshold specified by the SCAMD is a maximum incremental cancer risk that is $\geq$ 10 in 1 million. The EIR does not identify the increased carcinogens that will be associated with the project and does not assess their impact against such a standard. 13-68

- The DEIR does not adequately address the impacts of the increased wood smoke emissions from fireplaces and wood stoves. 13-69

- Table 5.6-1 does not include California's standard for visibility reducing particles, the current levels in Big Bear Valley, and how the project would impact this. In addition, it does not address these same issues with respect to the California annual standard for PM_{10} (20 $\mu g\ m^{-3}$ annual arithmetic mean). 13-70

- The serious impacts of the project on health are not adequately addressed in the DEIR. This is of particular concern with respect to fine particles ($PM_{2.5}$) from diesels and from wood combustion. 13-71

- The DEIR omits the most important effect which cannot be mitigated (at least for those impacted) and that is increased mortality. It is the increase in deaths due to particles that form the basis for the most recent particle standards [e.g. see Colburn and Johnson, *Science*, 299 665 (2003)]. 13-72

- Emissions of toxic air contaminants, TACs (California)/hazardous air pollutants, HAPs (federal) from all of the sources associated with the project, both mobile sources and stationary sources, are not treated adequately, despite existing standards for TACs/HAPs. 13-73

- The mitigation measures cited for air quality include the use of EPA certified fireplaces and the use of a catalytic converter on the chimneys. However, there is no legal mandate to do so and hence assuming that this will happen is highly dubious. The DEIR does not address the continuing cost of monitoring and enforcing the maintenance of such devices or the fact that enforcement resources are already inadequate. These mitigations are therefore illusionary. 13-74

- Page 5.6-18 describes future hydrocarbon emissions standards for watercraft. However, it is not clear if these were included in the emissions estimates, or if they were, if it was assumed that all watercraft associated with the project would meet these new standards. This would be equivalent to assuming that the project residents would be continuously purchasing new boats as the standards changed, a highly unlikely scenario. Furthermore, there is no treatment of emissions other than hydrocarbons from watercraft, and the associated impacts on air quality. 13-75

- Nothing has been included in the air quality analysis in section 5.6 to evaluate the effects of a local power generating plant that was suggested in the DEIR as a possible mitigation for impacts to electricity service. 13-76

Given the above reasons, the overall air quality analysis in the DEIR is completely inadequate and even though the DEIR has concluded that the development of this proposed project would cause significant and unavoidable impacts on air quality, those impacts have been grossly underestimated. 13-77

IX. Noise

- The noise section of this DEIR utilizes data which is decades old, making the analysis inadequate. The noise levels that would generated, both during construction and of a permanent nature, would have significant continuing negative impact to wildlife and recreational use as well as to neighboring residents. 13-78

- The statement in section 5.7-1 paragraph 3: "A 3 dBA change in sound pressure level is considered a "just detectable" difference in most situations" is incorrect. A 3-decibel increase doubles the sound pressure level of any signal. All of the conclusions that come from this flawed data are incorrect, and are the basis for much of the noise analysis of the DEIR. 13-79

- In Section 5.7.2: the DEIR failed to consider the funneling effect of noise from the highway into the adjacent residential areas. The proposed project site is at a crossroads in Fawnskin. The terrain rises sharply to the north and residences dot the hillside. The construction and permanent noise from the development will have a continuous negative impact to the quiet enjoyment of the lake, and the residents on the hills above, are, in some cases, less than 100 airborne feet from the project. 13-80

- Section 5.7-4 the last paragraph states "Existing sensors within the vicinity of the project...." In fact, the sensors used in the analysis are not in the vicinity of the proposed project and therefore are not registering correct SPL's. Most of the DEIR's noise data are from sensors that are completely out of the area of the site. No accurate measurement of current SPL levels is found in this document, so this analysis is flawed and inadequate. 13-81

- Per the chart 5.7-5: 85db, which is at the top end of "clearly unacceptable" as community noise exposure, will be exceeded by the construction and permanent noise from the proposed project. A realistic analysis of the gross noise generated from this project is in excess of what is labeled "clearly unacceptable." 13-82

- From 5.7-7 last paragraph: "The (computer) model does not account for ambient noise levels or topographical differences between the roadway and adjacent land uses". The steep rise of the terrain to the north is significant and does not factor into the DEIR's computer model. If the terrain were considered in the analysis, the noise levels would have been found to be undeniably significant. 13-83

- The data used in the Noise analysis using data from the Traffic Analysis report is completely inadequate and understates the noise impact, since the traffic analysis was flawed and invalid. 13-84

Even though Section 5.7-10, finds that: "This project will expose persons to noise levels in excess of the standards established in the general plan. It will create a substantial permanent increase in ambient noise above existing levels," it does so on a basis of underestimates of the true level of the significant impacts that the development of this project would have regarding noise. 13-85

X. Biological Resources

The DEIR's evaluation of the impacts on Biological Resources is incomplete and inadequate.

- In section 5.8, there is no analysis in the DEIR of the impacts that would be caused by removal of a substantial number of trees for moving the highway and creating internal roads, nor for the subsequent removal of additional trees for building houses. 13-86
- The DEIR analysis in section 5.8 fails to address the osprey, common visitors to the site. 13-87
- The mitigations proposed to protect the bald eagle habitat as proposed are impractical and ineffective, and the DEIR fails to recognize that in prior developments in the Big Bear valley, where the same bald eagle mitigations were instituted (e.g. Castle Glen), the bald eagles have been effectively driven from those projects. 13-88
- The potential removal of additional trees to support Section 5.3-1c mitigation for a 100-foot fuel modification is not analyzed anywhere in the Biological Resources section. 13-89
- In Section 5.8 drought-year botanical surveys yielded an incomplete assessment of rare plants. The result is an inaccurate document that clearly understates the expected extent and significance of impact to rare plants. 13-90
- The DEIR fails to include analysis of the impact to wildlife based on increases in road-kill from the increased traffic nor from the proposed highway realignment. 13-91
- Mitigation measure 5.8-1a which is supposed to reduce rare plant impacts to below significance relies on a process that has not been established or tested and is very vague and speculative. This measure as stated would not reduce impacts to special status plants and habitat to below significance. Plant surveys for areas that will be destroyed by road and other infrastructural construction need to be mitigated but this is not stated, again an incomplete measure. 13-92
- It is apparent from Highway 38 and properties on Flicker Road, that "open Jeffery pine forest" as characterized in the document meets the habitat definition of pebble plains, and supports special status species across 17.38 acres. As such, the impact is not just 0.69 acres as considered in the analysis, but the entire 17.38 acres. 13-93
- At a 3:1 mitigation ratio, it will be difficult if not impossible to find a willing seller of over 50 acres of pebble plains and associated rare plant habitat as 50 acres is approximately one quarter of the total available acreage on private land. The DEIR also fails to state that the cost of the parcel needs to be based on a current appraisal of Bear Valley acreage, plus a reasonable dollar amount for management. 13-94
- In 5.8-1c mitigation for eagles: the analysis understates expected impacts to trees and eagles. Removal of 655 trees (24% of 2,772) as stated under 5.4-1 and 5.4-10 are not analyzed or disclosed under biological resources. This impact would constitute the removal of substantial eagle roost habitat. While a mitigation for eagles states that all trees over 20 inches in diameter will be protected, it applies only on individual lots and does not hold the developer to that standard in road cutting and other structural changes required for the proposed project. In so doing, the DEIR fails to provide a credible plan for protecting the perch trees as required by 13-95

county code, which restricts removal of bald eagle perch trees "w/o adequate substitution", county code 89.0110(a). With normal exceptions to county code restrictions, the inevitability of tree cutting to create individual lots, and the removal of hazard trees and others to comply with fire clearance, this proposed project will significantly impact bald eagles and their habitat. The analysis is misleading in pretending that this mitigation will actually protect the bald eagle perch trees. 13-96

This DEIR analysis is inaccurate and inadequate and understates the level of significance of the impacts regarding wildlife and plants that would be caused by this proposed project.

XI. Hydrology and Drainage

- RBF consulting was directed by the County of San Bernardino to conduct a peer review of the 2003 "GSS Focused Geohydrologic Evaluation of Maximum Perennial Yield For the North Shore and Grout Creek Hydrologic Subunits" for incorporation into the DEIR. Engineering Geologist, D. Scott Magorien reviewed the report. He brought up six points (on pages 22 and 23) and did not think there was enough detail in the report to verify the water availability from the two wells on the tract. Magorien's conclusion is that the North Shore is in an overdraft situation, and that there should be a more thorough hydrolgeologic investigation to determine the water availability for this proposed project. None of this further analysis recommended by the County's own specialist was included in the DEIR. 13-97

- In the Technical Appendices report (page 33) of the 2003 GSS study of the perennial yield, it states that drought conditions will have a significant impact on ground water levels in the North Shore and Grout Creek Hydrologic Subunits. We are currently in the worst drought condition in history, but the EIR fails to include this in the analysis. 13-98

- The DEIR fails to include information and analysis on the degradation of water quality of the lake due to pesticides and chemical fertilizers being used and due to the increase in the dog population that would result from the development of this proposed project. 13-99

- In the Technical Appendices on Page 23 VIII. Hydrology and Water Quality under item (b) "Would the project substantially deplete groundwater supplies...," the box denoting "*no impact*" was marked, while in the Technical Appendices report on page 33 of the 2003 GSS study of the perennial yield they state "that drought conditions *will have a significant impact* on ground water levels in the North Shore and Grout Creek Hydrologic Subunits." The DEIR analysis contradicts even its own information; clearly a finding of significant unmitigable impacts is warranted. 13-10

- Section 5-11 on page 7: states the water is of superior quality. Then the DEIR states that one well exceeds the concentration allowed for iron--0.69 parts per million gallons when the state maximum is 0.3 parts per million gallons. Again the DEIR analysis contradicts itself. 13-10

With the current drought, and by the County's own hydrology expert's report, the impacts caused on hydrology and drainage created by the development this proposed project would have a higher level of significance than the DEIR states. 13-10

XII. CONCLUSION

Friends Of Fawnskin incorporates by reference any and all comments made regarding this project, even if made in the past or future, in order to enforce the non-discretionary requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). FOF has raised many critical issues in this response, but our concerns are not limited to only these specific items. Further, if this DEIR is revised, amended, or a supplemental document prepared, the entire document must be circulated once again so that the public and the decision-makers can be properly informed prior to making any decision on this project, as required by law.

We again formally request timely notification in advance of all meetings, documents, and decisions regarding this proposed project.

13-10

The Draft EIR for the proposed Moon Camp Project currently in circulation has failed to adequately assess the level of significance of the negative impact on aesthetics, fire protection, police protection, water, electricity, traffic and circulation, air quality, noise, biological resources and hydrology and drainage.

The DEIR is incomplete, inaccurate, and defective and must be rejected in its present form. It clearly fails to meet the requirements of CEQA. Furthermore, multiple significant impacts are understated and sugar coated in a thinly veiled attempt to convince the Board of Supervisors to approve this project with overriding considerations. The project, on the basis of the present proposal is so entirely contrary to the guidelines of the County's General Plan and the best interest of the tax-paying public that it warrants nothing less than a categorical denial. We urge the Board to carefully evaluate this project and select the No Project Alternative in the interest of the Public Trust.

Respectfully submitted,

Sandy Steers
for the Friends Of Fawnskin

Response to Commentor No. 13
Sandy Steers, Friends of Fawnskin
May 15, 2004

13-1 The County will consider the Commentor's opinion and comments during their deliberation on the project.

13-2 The Commentor states that Section 4.0, *Basis for Cumulative Analysis*, omits two large projects – the Castle Glen development in Big Bear Lake and the tripling in size of the Big Bear Discovery Center to accommodate increased tourist traffic. In addition, the Commentor mentions two other parcels (one 30 acres and one 7.5 acres) very near the Moon Camp site that are in the early stages of development. Table 4-1, *Cumulative Project List*, outlines seven projects in the vicinity of the project study area that were considered for the cumulative analysis. At the time the Notice of Preparation for the Draft EIR was distributed, the projects referenced by the Commentor were determined by the County of San Bernardino to not have the potential to interact with the proposed project to the extent that a significant cumulative impact may occur. However, those projects mentioned in the comment letter and not included in the cumulative impacts list, even if approved or probable at the time of the NOP, would be considered part of the background growth added to existing conditions to account for unknown future projects.

Also, in regards to the traffic analysis, the long-term future traffic conditions were not based upon the list of cumulative projects identified in Section 4.0, but rather an annual growth rate of 1.0 percent recognized by the County of San Bernardino. The annual growth rate approach was utilized to account for cumulative projects, since listing the individual cumulative projects typically can lead to double counted trips.

13-3 The EIR indicates that potential impacts to groundwater resources are significant and unavoidable (refer to Impact Statement 5.11-2 in the EIR). The County will consider the Commentor's opinion and comments during their deliberation on the project.

13-4 The Final EIR will include a Mitigation Monitoring Program that will identify the timing and responsibility for monitoring each mitigation measure. The Project Applicant will have the responsibility for implementing the measures, and the various County of San Bernardino departments and/or other governmental agencies would have the primary responsibility for monitoring and reporting the implementation of the mitigation measures.

13-5 Pursuant to the California Environmental Quality Act (CEQA), a Notice of Preparation (NOP) of the Draft EIR was distributed to appropriate governmental agencies, determined by the County of San Bernardino, which included California Department of Transportation (District 8), Department of Conservation, Department of Forestry and Fire Protection, U.S. Forest Service, Department of Fish and Game, California Highway Patrol, State Water Resources Control Board, and the Regional Water Quality Control Board (Region 9). The NOP comment period allowed the various governmental agencies to provide input regarding potential issues to be analyzed in the EIR. Furthermore, the Draft EIR was sent to the California State Clearinghouse to initiate the 45-day public review period. The State Clearinghouse is responsible to

distribute the Draft EIR to all responsible or other public agencies to review and comment on the environmental documentation. Thus, all appropriate reviewing agencies were able to provide input on the Draft EIR during the public review period. The California Department of Transportation did receive a copy of the Draft EIR and was consulted with during the preparation of the Draft EIR. Section 14.2, *List of Commentors*, identifies the Federal, State and local governmental agencies that provided comments on the Draft EIR. Responses have been provided in this section regarding the reviewing agencies comment letters.

13-6 In accordance with CEQA Guidelines Section 15126.6, Section 7.0, *Alternatives to the Proposed Project*, describes a range of reasonable alternatives to the proposed project, which could feasibly attain the basic project objectives and would avoid or substantially lessen any of the significant effects. The evaluation also reviews the comparative merits of each alternative. The analysis focuses on alternatives capable of eliminating significant adverse environmental effects or reducing significance, even if these alternatives would impede, to some degree, the attainment of the project objectives. In light of these objectives, Section 7.5, *Environmentally Superior Alternative*, concludes that the "Reduced Density, Without Road Alignment and Without Marina" Alternative is the environmentally superior alternative.

13-7 As stated in Section 6.3, *Growth Inducing Impacts*, growth inducing project impacts were based on an average household size multiplier of 2.31 persons per household, rather than vacancy/occupation rates. To determine growth-inducing project impacts, the average household size was applied to all proposed 92 dwelling units.

The analysis of project impacts in Section 5.0, *Description of Environmental Setting, Impacts and Mitigation Measures*, is based upon development of 92 dwelling units on the project site. Where applicable, impacts have been determined by the use of multiplier factors for single-family residences. For example, annual water consumption was based upon a consumption factor for a typical household in the Fawnskin area. This factor was applied to all 92 proposed dwelling units over the course of one-year. By applying a multiplier factor to all 92 residences, the identified impacts are representative of full-time occupancy.

13-8 Section 15131 of the CEQA Guidelines addresses the topics of economic and social effects.

> *"Economic or social information may be included in an EIR or may be presented in whatever form the agency desires.*
>
> *(a) Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes."*

CEQA and the CEQA Guidelines state that effects analyzed must be related to a physical change in the environment. As such, economic effects are not considered environmental effects under CEQA, and should be considered in an EIR only if they would lead to a physical impact on the environment. The review of economic effects is optional by a lead agency. Section 15131 of the CEQA Guidelines defines the conditions under which economic effects should be reviewed in an EIR. The conditions outlined above do not apply to the project.

13-9 As discussed in Impact Statement 5.1-2 (and 5.1-1) of the EIR, analysis has concluded that the proposed District change is in the public interest based on the following factors:

- The project would be considered compatible with adjacent land uses and community character since it would be an extension of the existing land use pattern of RS Districts.
- The project would allow for a variety of housing types since the proposed 95-lot residential subdivision would provide 92 residential lots ranging in size from 0.17 acres (7,292 square feet) to 2.11 acres (refer to Exhibit 3-4, *Site Plan – Tentative Tract #16136*).
- The proposed project would offer an opportunity for a cohesively planned development, which would be subject to compliance with the County's administrative design guidelines, as well as the development standards specified for the RS District.
- The project would be required to comply with the mitigation measures specified in the EIR to avoid or lessen potential project impacts. The measures identified in this document have taken into consideration the property's setting, opportunities, and constraints. Following compliance with the specified development standards, design guidelines, and mitigation measures, project implementation would not compromise existing single-family residential and rural land uses.

Overall, the Draft EIR has identified and evaluated the potential adverse effects associated with implementation of the proposed project. As noted by the Commentor, the Draft EIR has concluded that project implementation would result in unavoidable significant impacts regarding water demand and views/viewshed alterations. The Commentor is not specific, as to how the project would result in critical adverse effects associated with public safety and public health. The County will consider the Commentor's opinion that the proposed zone change "is not in the public interest" during their deliberation on the project.

13-10 The project site is presently classified as Rural Living-40 (RL) District (refer to Section 84.0320 of the County Development Code). Permitted or conditionally permitted uses within the RS District include, but are not limited to, single dwelling units, accessory uses, mobile home parks and/or Planned Developments. Further, as indicated in Table 5.1-1, *Summary of Land Uses*, of the EIR, areas surrounding the subject site are designated Improvement Level 1 (IL1), which is applied to those areas planned for a higher intensity level of development. Thus, the County

Development Code anticipated that the subject property would be developed and not designated for public open space use. It should also be noted that due to the nature and environmental setting of the Community, National Forest and public open space exists adjacent to or nearby most properties.

13-11 As noted by the Commentor, County General Plan Code C-56 "restrict(s) development along scenic corridors." To clarify, this policy is intended to keep development within certain limits, rather than to prohibit it. The Draft EIR has concluded that project implementation would result in unavoidable significant impacts regarding views and viewshed alterations.

It should be noted that the project would be subject to compliance with the County's administrative design guidelines, as well as the development standards specified for the RS District. Additionally, future lot development would be required to comply with the 40 percent maximum building coverage and the 35-foot maximum building height, which would minimize potential aesthetic impacts. Further, the project would be required to comply with the mitigation measures specified in the EIR to avoid or lessen potential project impacts. The measures identified in the EIR have taken into consideration the property's setting, opportunities and constraints.

13-12 Commentor refers to the Project's consistency with the General Plan. Please refer to Response to Comment No. 13-11, which addresses this concern.

13-13 As acknowledged in Section 5.3, *Public Services and Utilities*, project implementation would increase development beyond existing conditions, thus increasing the demand for fire protection in the form of additional calls for service. The project site is located in a high fire hazard area and Fire Hazard Overlay District. Accordingly, project development would be subject to compliance with various policies and standards for adequate services and facilities. Additionally, the project would be required to meet the Peakload Water Supply System Guidelines (Figure II-5 of the General Plan, *Peakload Water Supply System Guidelines*) or be adequately served by water supplies for domestic use and community fire protection in accordance with standards, as determined by the County and the local fire protection agency/authority.

A fuel modification area and plan would be required under the provisions of the FS1 Fire Safety Overlay District (refer to Response to Comment No. 13-27). A Fuels Management Plan would be established for the project to implement the fire safety requirements of the FS1 Overlay District (refer to Response to Comment No. 4-4). The Fuels Management Plan would be subject to review and approval by the San Bernardino National Forest Service and the San Bernardino County Fire Department. The fire flow requirements and Fuel Management Plan requirements along with additional mitigation measures listed (Mitigation Measures 5.3-1a to 5.3-1e) would reduce impacts to fire protection services to a less than significant level.

13-14 As indicated by the property's existing RL District and IL1 designations (refer to Response to Comment No. 13-10), the County Development Code anticipated that the subject property would be developed. Additionally, the *Growth Management* section of the General Plan focuses on ways to monitor and manage future growth of the County in order to preserve valuable resources and maintain a high quality of life

for all residents. The General Plan divides the County into three broad development areas: urban, rurban (combination of urban and rural areas), and rural. These development area designations then define the types of uses that are allowed, enabling the County to anticipate the types of services they will need to provide. The project site is located within a designated Urban Area (UA). Urban Areas are areas that are committed or planned for higher density/intensity uses. According to the General Plan, a full range of public facilities and services (including water, sewer, roads, flood control/drainage, police and fire services, etc.) shall be focused on these areas. As previously noted, the project proposes a Land Use District Change to RS, which is a permitted land use District in an UA. Thus, growth commensurate with the proposed project was anticipated for the project site and the project would not be considered growth inducing in this regard.

Overall, the proposed development would not require the substantial development of unplanned/unforeseen support uses and services as is evidenced by the site's and the surrounding area's existing IL-1 and UA designations. As a result, the proposed project would not result in significant growth-inducing impacts.

Land use compatibility impacts associated with land development are a factor of quality of life issues, including, but not limited to traffic, noise, air quality and aesthetics (views/physical scale). While these may generally be perceived as subjective issues, the significance criteria detailed in each of the respective EIR issue sections provides a basis for assessing these quality of life factors.

13-15 Commentor refers to the Project's consistency with the General Plan. Please refer to Response to Comment No. 13-10, which addresses this concern.

13-16 The Commentor is not specific, as to how the project would increase public health and safety risks. The Draft EIR concluded that project implementation would result in unavoidable significant impacts regarding views and viewshed alterations. The County will consider the Commentor's opinion during their deliberation on the project.

13-17 The County will consider the Commentor's opinion during their deliberation on the project.

13-18 Commentor refers to the completeness of the cumulative impact analysis associated with project implementation. Please refer to Response to Comment No. 13-2, which addresses this concern. The County will consider the Commentor's opinion during their deliberation on the project.

13-19 As acknowledged in Section 6.3, *Growth Inducing Impacts*, the proposed project has the potential to increase Fawnskin's population by approximately 212 persons at buildout. The project's potential population growth would represent an approximately 52 percent increase over the Community's permanent population estimate of 409 persons (2000) and an approximately 15 percent increase over the Community's peak weekend/holiday period population of 1,428 persons. Project implementation would be considered growth inducing in as much as the proposed development would result in the construction of additional housing, consequentially fostering population growth. However, potential growth-inducing impacts are also assessed

based on a project's consistency with adopted plans that have addressed growth management from a local and regional standpoint.

According to the General Plan, the project site is designated Urban Area. Urban Areas (UA) are areas that are committed or planned for higher density/intensity uses. A full range of public facilities and services (including water, sewer, roads, flood control/drainage, police and fire services, etc.) shall be focused on these areas, according to the General Plan. As previously noted, the project proposes a Land Use District Change to RS, which is a permitted land use District in an UA. Thus, growth commensurate with the proposed project was anticipated for the project site and the project would not be considered growth inducing in this regard. The proposed development would not require the substantial development of unplanned/ unforeseen support uses and services as is evidenced by the site's and the surrounding area's existing IL-1 and UA designations. As a result, the proposed project would not result in significant growth-inducing impacts. Refer also to Response to Comment Nos. 13-10 and 13-14.

13-20 The project proposes single-family residential uses that are permitted within the RS District. The project also proposes a marina boat dock and associated parking lot, which may be permitted within the RS District, subject to an approved Conditional Use Permit (CUP). The proposed project would be consistent with the development standards for the Bear Valley Planning Area regarding minimum lot size, and maximum and minimum lot dimensions, since the project proposes a minimum lot size of 7,292 SF and the proposed residential lots meet the maximum and minimum lot dimensions. The proposed residential lots would be sold individually and development of lots and construction of dwellings would be by custom design. Through the site plan review process, future lot development would be required to comply with the 35-foot maximum structure height, 40 percent maximum lot coverage, and the front, side, rear, and street side yard setbacks. Additionally, future development would be required to comply with the County's administrative design guidelines and mitigation measures identified in this EIR to avoid or lessen potential impacts. Refer also to Response to Comment No. 13-10.

13-21 The designated Improvement Level (IL) for each area is illustrated on the County's *Infrastructure/Improvement Levels Overlay Map*. According to this Map, the project site and surrounding areas are designated IL1 (refer to Table 5.1-1, *Summary of Land Uses*).

13-22 As noted by the Commentor, the Draft EIR has concluded that project implementation would result in unavoidable significant impacts regarding views and/or viewshed alterations. From a transportation/circulation standpoint, the project would be required to construct State Route 38 (North Shore Drive) in compliance with the special standards and conditions specified by Caltrans. As indicated in Section 5.5, *Traffic and Circulation*, implementation of the proposed project would not overburden State Route 38, as it would result in a less than significant impact to the Level of Service (LOS) for the Highway. Also, as the proposed highway improvements would occur in two phases, the project would not impair emergency vehicle access or escape routes during emergencies. Highway construction would be subject to compliance with various development criteria and Caltrans standards relative to setbacks, prohibited direct access, the provision of left turn lanes (as

necessary), shoulder width requirements, and pedestrian crossing requirements. The project's proposed realignment of State Route 38 would be subject to County of San Bernardino and Caltrans policies and standards. With the proposed amendment to the Transportation/Circulation Maps, the project would be considered compatible and consistent with the General Plan. Thus, it is concluded that impacts would be less than significant in this regard.

13-23 The County will consider the Commentor's opinion during their deliberation on the project.

13-24 The Commentor is correct in the statement that the proposed project may have an adverse effect on the physical environment, but that these impacts are concluded to be less than significant. As stated in Impact Statement 5.2-1, compliance with the Big Bear Metropolitan Water District (MWD) standards and permit requirements (i.e., Mooring Plan, Shore Zone Alternation Permit, review of Storm Water Pollution Prevention Program (SWPPP)) would ensure that impacts in this regard are reduced to less than significant levels.

Section 5.2, *Recreation*, analyzes impacts that relate to the construction or expansion of recreational facilities that may have a physical effect on the environment. The Commentor refers to impacts to bald-eagle foraging habitat as a result of dredging the lake. As stated above, impacts to the physical environment (i.e., lake) would be reduced to less than significant levels through regulatory compliance. Impacts to bald eagles are addressed in Section 5.7, *Biological Resources*.

The Commentor refers to a lack of analysis of boat storage during the seven months of the year when they are not in use. Boat storage and use would vary for each boat owner. However, boat storage would not create an adverse physical effect on the environment, as all hazardous materials associated with boat storage would be subject all local, state and federal regulations.

The Commentor refers to a lack of analysis in the traffic study regarding residents pulling boats in and out of the marina facility. The traffic study analyzes impacts associated with traffic load and capacity of the street system. Although the traffic study does not specifically call out trips to the marina facility by the Moon Camp residents, the traffic study assigns a daily trip generation rate that includes an average of all daily trips generated by the proposed residential uses. As such, the traffic analysis appropriately identifies traffic-related impacts to the street system, including impacts as a result of trips generated by Moon Camp residences to/from the proposed marina facility. The traffic analysis concludes that with implementation of the recommended mitigation measures, all traffic-related impacts would be reduced to less than significant levels.

The Commentor also states that the permanent impact of additional traffic on the lake, with related noise, fuel emissions, and loss of space on the lake for fishing and boating activities due to entrance and exit traffic has not been addressed. First, the additional traffic on the lake has been addressed under Impact Statement 5.2-1, which concludes that the lake capacity would not be surpassed with implementation of the project based upon the Big Bear MWD Management Plan. Second, noise and

air emissions from vehicular traffic have been addressed in Sections 5.7, *Noise*, and Section 5.6, *Air Quality*, respectively. Analysis of noise and air quality impacts is based upon the traffic study, which assigns a daily trip generation rate for residential uses, as described above. Third, the loss of space on the lake due to the marina facility is addressed under Impact Statement 5.2-2 of the EIR. The EIR concludes that since the project site is private property, public access is not assured. However, public access to the lakeshore would be maintained at the eastern and western boundaries of the site. Public access to the lakeshore would also continue to be maintained at other locations along the perimeter of the lake. Refer also to Response to Comment No. 13-26.

13-25 The Big Bear Metropolitan Water District (MWD) Management Plan indicates that the average annual weekend use factor for docks on the lake is nine (9) percent. The Commentor states that the weekend use factor during the summer is 60 percent and 90 percent on holiday weekends. According to the Management Plan, the lake has a carrying capacity of 1,000 boats. The Management Plan states that during the summer peak season, from 1996 to 1999, the highest average daily use of boats was 262 during the 1996 season. Since these statistics were developed 2000, it is assumed that the current summer peak season average boat usage has incrementally increased over the past several years to closer to 300 boats per day. However, even if assuming all 100 boats are used during the summer peak season, the carrying capacity of the lake would not be surpassed. Additionally, it is acknowledged that during peak holiday periods, the boating usage numbers increases beyond the summer peak season. However, according to Management Plan, current lake use statistics show that it is unlikely that in the foreseeable future, the District would need to consider any restriction on the number of boats on the Lake. In fact, as long as the parking facilities remain at the current level, use of the Lake is somewhat self-restricting.

13-26 In consideration of the proposed residences along the lakefront and their proximity to existing residences to the east and proposed residential uses to the west, the EIR text has been updated to accurately reflect the nature of public access to the lakeshore.

Page 5.2-5, Paragraph 2 of the Draft EIR, has been revised in the Final EIR as follows:

> The County of San Bernardino General Plan Goal C-54 states the intention to "provide public access to all water bodies and water courses." Furthermore, Policy/Action OR-48 states that, "Because the County seeks to improve the ability of the public to enjoy water-related recreation, the County shall seek to improve public access to rivers, lakes, creeks, lakes and other bodies of water." Additionally, Policy/Action OR-49 states that "Because public access to water for recreational uses is important to the County, easements and dedications allowed in the Subdivision Map Act to acquire access to lakes, streams, public lands and other locally and regionally significant natural features shall be required for all new development." ~~However, since the Project site is private property, public access is not assured~~. As the project abuts existing homes to the east and the proposed Marina Point Development to the west, ~~P~~public access to the lakeshore would be

maintained below the high water line of the lake.~~maintained at the eastern and western boundaries of the site~~. Public access to the lakeshore also continues to be maintained at other locations along the perimeter of the lake. However, since the Project site is private property, public access is not assured.

13-27 As stated in Response to Comment Nos. 4-1 and 4-4, the Final EIR text will reflect that the project area is located within a Fire Safety Area 1 (FS1), as designated by the County of San Bernardino General Plan Hazard Maps. Thus, the project would be subject to all project design requirements for projects located within a FS1 area. The San Bernardino County Fire Department has indicated that due to the size and scale of the proposed project, specific fire flow requirements would need to be met. Instead of 1,500 gpm at 2 hours (which is based on a maximum square foot house of 3,600 square feet), the fire flow requirement would be 1,750 gpm at 2 hours, based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm at 2 hours, based on homes greater than 4,800 square feet. Homes above 5,000 square feet would have a larger sprinkler requirement. Additionally, a fuel modification area and plan would be required for the proposed project under the provisions of the FS1 Fire Safety Overlay District. The project would include a 100-foot fuel modification zone located along the northern and eastern perimeter to provide a fuel break between the project area and the adjacent forestland. The fire flow requirements and Fuel Management Plan, along with the identified mitigation measures, would reduce impacts to fire protection services to less than significant levels.

Also, refer to Response to Comment Nos. 4-1 and 4-4.

13-28 In Section 5.3, *Public Services and Utilities*, the analysis of fire protection services is not intended to analyze availability of groundwater resources, but rather is intended to identify the necessary fire protection resources that are required to meet the fire protection needs of the project. Water resources are analyzed in Section 5.11, *Hydrology and Drainage*. As stated in the Section 5.11, it has been concluded that impacts to groundwater resources is a significant adverse effect and until additional technical review is conducted to verify conditions, the project would result in an unavoidable impact to groundwater resources. The Project Applicant will have the responsibility to prove that water resources are available to serve the project. The County will consider the Commentor's opinion and comments during their deliberation on the project.

13-29 The Commentor is correct in that the additional fire flow alone would not mitigate for additional manpower. The EIR text has been revised to reflect that fire flow requirements are only one component to be provided for adequate fire protection services to the project area. The project will be subject to all FS1 fire safety overlay district standards and requirements and would also include a fire modification zone adjacent to National Forest Lands, as discussed in Response to Comment Nos. 4-1, 4-4 and 13-27.

13-30 Commentor refers to fuel modification zones and associated permit requirements. Please refer to Response to Comment No. 4-1, which addresses this concern.

13-31 Please refer to Response to Comment No. 4-4. The recommended mitigation measures regarding fire protection services have been updated to reflect the FS1 standards and requirements, as well as to identify plans for implementation and enforcement.

13-32 According to the CEQA Guidelines, impacts regarding "hazards and hazardous materials" must analyze whether the project would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The project would have access from State Route 38, which is the primary roadway serving all of the Big Bear Lake area. The traffic analysis has recommended mitigation measures to reduce all traffic-related impacts, including safety hazards and emergency access, to less than significant levels. Refer to Mitigation Measure Nos. 5.5-4a to 5.5-4g.

Additionally, should a fire occur to the east or west of the project, emergency access and/or evacuation routes would be provided from two directions to/from the site via State Route 38. Since State Route 38 provides two ways of reaching any point within the site, emergency access is determined to be adequate. Similarly, State Route 38 would provide two directions to evacuate the site. Local, State and/or Federal authorities would be responsible for conducting evacuation planning and timing in the event of a fire. It is the responsibility of residences to comply with evacuation timing and directions from local, State and/or Federal authorities should a fire occur in the project area. The development of the project site with the proposed residential uses would not result in changes to evacuation routes in the project area. Thus, the project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

13-33 As the project proposes 92 residences and a marina facility, medical aide calls to the Fire Department would increase beyond existing conditions. However, the increase in medical aide calls would not result require modifications to existing fire facilities, including Station 49. Thus, the project would not result in substantial adverse physical impacts associated with the provision of new or altered governmental facilities in regards to an increase in medical aide calls to the Fire Department.

13-34 Commentor refers to the urban/forest interface and the increased fire risk associated with the Project. Please refer to Response to Comment Nos. 4-1, 4-4, and 13-27, which addresses these concerns.

13-35 Future on-site uses, including fuel use and storage at the proposed marina, would be required to comply with all requirements of the San Bernardino County Fire Department Hazardous Materials Division for the storage and use of any hazardous materials utilized at a specific facility. Therefore, compliance with all permitting requirements and regulations set forth by local, State and Federal regulatory agencies would ensure that the project would not create a significant hazard to the public or the environment from associated fire risks.

13-36 The Commentor has stated that the EIR lacks analysis of whether fire insurance would be available with implementation of the proposed project. It is beyond the scope of the EIR to assess fire insurance coverage provided by private companies to

residences in the project vicinity. The County will consider the Commentor's opinion and comments during their deliberation on the project.

13-37 The County will consider the Commentor's opinion and comments during their deliberation on the project.

13-38 The Community of Fawnskin is located within the jurisdiction of the Big Bear Sheriff's Station. According to the Big Bear Sheriff's Station, the average response time to emergency type calls is 6.97 minutes within their jurisdiction, which includes the Community of Fawnskin. The average response time for all unincorporated areas is 28.59 minutes. Response times would be similar year around as police staffing would increase to correspond with increased visitors during peak weekend and holiday periods.

Page 5.3-2 of the Draft EIR, Paragraph 3 has been revised in the Final EIR as follows:

> The Big Bear Sheriff's Station provides police protection services to a population of approximately 15,800 persons in the unincorporated San Bernardino County areas of Big Bear Valley. The Community of Fawnskin is located within the jurisdiction of the Big Bear Sheriff's Station. The average response time for emergency calls ~~to the unincorporated county area~~ within the jurisdiction of the Big Bear Sheriff's Station is 6.97 minutes. The response times may vary, plus or minus, depending on the number of service calls received. According to the Sheriff's Crimes Analysis Unit, between January 1, 2000 and January 1, 2001, the Sheriff's Department handled 9,028 calls for service in the unincorporated area of Big Bear Valley.[1]

13-39 The project area would be served by the Big Bear Sheriff's Station, which serves an unincorporated population of approximately 16,000. The project would increase the population of Fawnskin by approximately 212 persons, which is an approximately 0.01 percent increase over the unincorporated population. Although police protection services would need to be nominally increased as a result of the project, it is anticipated that project implementation would not require any new police facilities or the alteration of existing facilities to maintain acceptable performance objectives. The project's increase in demand for police services would be offset through project related fees and taxes.

13-40 As stated in Response to Comment No. 13-39, the project would result in a nominal increase in service calls (emergency or non-emergency) to the project area. Similar to the increase in emergency type calls, any impact created by non-emergency calls would be offset through project related fees and taxes.

13-41 The County will consider the Commentor's opinion and comments during their deliberation on the project.

13-42 The EIR is correct to conclude that the project is not subject to SB221 reporting requirements. Additional text has been added to the Final EIR to clarify that based

upon the definition of a public water system being at least 3,000 connections; project implementation would not trigger the SB221 reporting requirements.

Page 5.3-8 of the Draft EIR, the second bullet point has been revised in the Final EIR as follows:

- Any proposed development that increases connections by 10 percent or more, if the PWS has fewer than 5,000 connections. Water Code 10912(7)(C) states that a "public water system" is defined as a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections.

Page 5.3-18 of the Draft EIR, the second bullet point and proceeding text have been revised and text has been added in the Final EIR as follows:

- Any proposed development that increases connections by 10 percent or more, if the PWS has fewer than 5,000 connections. Water Code 10912(7)(C) states that a "public water system" is defined as a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections.

Based on the "Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001" the following excerpt shows that 300 dwelling units are necessary to qualify as a "subdivision," and therefore be subject to SB 221.

> *"Code 66473.7(a) provides that a "subdivision" for a public water system with fewer than 5,000 service connections is a proposed development that would increase the number of service connection for a public water system by 10% or more, a "subdivision" could be as few as 300 dwelling units. For example, a water utility that has 3,000 service connections would experience an increase in the number of service connections by 10% if it were required to serve a proposed residential development with 300 units, thus making the 300-unit development a "subdivision" under 221."*

As stated above, Water Code 10912(7)(C) states that a "public water system" is defined as a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections. Therefore, if Fawnskin has only 673 connections it does not qualify as a "public water system," but rather a piece of a larger "overall system." Whether the project is under the jurisdiction of the DWP or the County Special Districts Department, each of these agencies "overall system" has more than 3,000 connections qualifying them as public water systems. Thus, the proposed 92 dwelling units would not exceed 10 percent of the 3,000 connections or 300 dwelling unit minimum dwelling unit threshold to be subject to SB 221 reporting requirements.

~~The proposed meets neither of the above scenarios.~~

13-43 The EIR concludes that based on the data available at the time of preparation of the Draft EIR, impacts to groundwater resources are significant and unavoidable. Further analysis and testing is required to prove that groundwater resources are available to serve the project. The County will consider the Commentor's opinion and comments during their deliberation on the project.

13-44 The GSS 2000 Report concluded that groundwater quality in the Moon Camp area is generally of superior water quality. All concentrations were below maximum contaminant levels (MCLs), with the exception of iron with a concentration of 0.69 mg/L. All potential water resources, including any wells utilized as a water resource for the proposed project, would be subject to all applicable local, State and/or Federal groundwater quality standards, which include potential for mineral contamination. Thus, analysis of any potential water resources would be required to verify compliance with all applicable water quality standards. Additionally, Mitigation Measures 5.3-6a and 5.3-6b have been modified to ensure groundwater water quality from existing wells meet all applicable groundwater standards.

The following paragraph, to be added below Paragraph 3 on Page 5.11-23 of the Draft EIR, will be included in the Final EIR:

GROUNDWATER QUALITY

As stated in the Existing Conditions section above, groundwater samples collected from Well FP-2 located on the southern portion of the Moon Camp site in 1987 were submitted for a full Title 22 analysis. The chemical analysis indicated that the groundwater quality in the Moon Camp area is generally of superior water quality, with the exception of iron concentration. Thus, if existing on-site wells are utilized for obtaining water resources for the proposed project, mitigation measures have been recommended to ensure that the wells are in acceptable operating condition and that groundwater does not exceed the maximum contaminant level (MCL) for iron concentrations (refer to Mitigation Measures 5.3-6a and 5.3-6b). However, it also acknowledged that all potential water resources, including the above referenced wells, for the proposed project would be subject to all applicable local, State and/or Federal groundwater quality standards.

Page 5.3-23 of the Draft EIR, Mitigation Measures 5.3-6b and 5.3-6c have been revised and text has been added in the Final EIR as follows:

5.3-6b If either or both of the two existing on-site wells are utilized as a water source for the project, ~~T~~the Project Applicant shall equip the~~two existing on-site~~ wells to meet DWP and/or County Special Districts Department standards and dedicate these facilities and water rights to the appropriate water purveyor~~County of San Bernardino~~. Within the proposed tract, no individual private irrigation wells shall be permitted.

5.3-6c ~~If served by CSA 53-C through a contract with the City of Big Bear Lake Department of Water and Power, t~~ After a determination has been

made regarding the water purveyor, the Project Applicant shall advance fair-share funds ~~or enter into a reimbursement agreement with the~~ to the appropriate water agency (CSA and/or DWP)~~(if required)~~ towards constructing a new reservoir and pipeline improvement at Cline-Miller Reservoir (with an estimated project cost at $481,100). These facilities would be dedicated to the appropriate water agency.

13-45 The County will consider the Commentor's opinion and comments during their deliberation on the project.

13-46 Water utilized for construction activities is considered a short-term impact and would cease upon project completion. However, since no water resources are currently available to the project site, water utilized during construction activities would need to be provided by the Project Applicant and/or Contractor. Proof of availability of water resources for construction activities would be provided by the Project Applicant and/or Contractor prior to grading activities associated with the project.

13-47 A Homeowners Association would enforce Mitigation Measure 5.3-6d. The water conservation measures in Mitigation Measure 5.3-6d were developed in consultation with the County of San Bernardino during the preparation of the Draft EIR. The water conservation measures are the minimum measures that shall be complied with in conjunction with domestic water supply to the project. Additional water conservation measures may be imposed as a result of a contract for water supply between CSA 53-C and/or the City of Big Bear Lake DWP. The County will consider the Commentor's opinion and comments during their deliberation on the project.

Also, refer to Response to Comment No. 4-2.

13-48 As shown in Response to Comment No. 1-3, the Final EIR text will include a discussion of water withdrawn from private wells for both the North Shore and Grout Creek Hydrologic Subunits. Pumping data for the 20 private wells in the North Shore Hydrologic Subunit was not available. However, assuming that they are domestic sources and that an average single family home uses approximately 200 gallons per day per year (gpd/yr), it is estimated that production from these wells is approximately 4.5 acre-ft/yr. Similarly, pumping data for the 29 private wells in the Grout Creek Hydrologic Subunit was not available. However, based upon the consumption factor, stated above, it is estimated that production from these wells is approximately 6.5 acre-feet per year. Although water withdrawn from private wells only comprises approximately 11 acre-feet per year in both of the subunits combined, it has been concluded that the North Shore Hydrologic Subunit is likely in a state of overdraft and further analysis and testing is required to prove that water resources are available to serve the project.

Also, refer to Response to Comment No. 1-3.

13-49 An increased demand for electrical service would occur at the project site as a result of the proposed development. According to Bear Valley Electric Service (BVES), it is anticipated that there would be a substantial loading increase upon build-out of the proposed project. However, BVES has indicated that electric service could be

provided with construction of new facilities. BVES would consider several alternatives to provide electricity to the site. One alternative would be to connect to existing power lines. Another alternative would be to investigate a distributed generation option. Distributed generation involves placing a power source (i.e., reciprocating engine that uses natural gas to power generator) on the site that would generate power on an as needed basis, such as during peak load times (i.e., winter, holiday weekends, etc.). As it is unknown whether a distributed generation will be considered as a feasible option by the BVES, the environmental impacts for the distributed generation option are appropriately not considered in this analysis. However, if the distributed generation option were considered by the BVES, future environmental documentation in accordance with the CEQA would be required, as necessary. In any case, the Project Applicant would be required to pay all costs/fees for the expansion of existing facilities and/or construction of new facilities to maintain the existing level of service to existing BVEC customers, while adding new load to the system.

13-50 Commentor refers to the potential impacts as a result of constructing an alternative electrical power source on the project site. Please refer to Response to Comment No. 13-49, which addresses these concerns.

13-51 The County will consider the Commentor's opinion during their deliberation on the project.

13-52 Section 5.4, *Aesthetics*, states that the proposed project would be required to comply with the glare and outdoor lighting provisions of the County of San Bernardino Development Code (i.e., Section 87.0921 et. seq.). The County of San Bernardino would assure compliance with the Development Code during the plan review process.

13-53 The County will consider the Commentor's opinion during their deliberation on the project.

13-54 The view simulations present an anticipated development scenario, thus, they are not representative of architectural design and final development plans for the placement of new residences. Although the architectural style may not be precisely representative of the final development plans, the visual simulations do illustrate the density of the proposed residential uses. The visual simulations are intended to illustrate the change in visual character of the site and the effects to scenic corridors/vistas. Utilizing the visual simulations, it has been concluded that due to the siting and density of the proposed residential uses, significant and unavoidable impacts related to "aesthetics/light and glare" would occur as a result of viewshed alterations involving existing residents to the north, east and west of the project site. Additionally, significant and unavoidable impacts have been identified for views from State Route 38, a scenic highway, to the south and from the south shore of Big Bear Lake.

13-55 The visual simulations include existing vegetation as well as anticipated ornamental landscaping. Comparing the existing versus the simulated views, the largest trees are the existing Jeffrey pine trees. The simulated views do not add large, mature Jeffrey pine trees to the views. Although ornamental landscaping would vary

between each proposed residence, it is likely that the ornamental landscaping would be fast growing vegetation and/or planted in a mature stage of growth. As stated in Response to Comment No. 13-54, the view simulations were utilized as an analytical tool to assess impacts associated with the change in visual character of the site and effects to scenic corridors/vistas. Although the ornamental landscaping may vary from the view simulations upon the initial completion of the project, the conclusion of significance of impacts will not change as a result of modifying the maturity of the ornamental vegetation in the simulated views.

13-56 Visual impacts to the lake associated with the marina facility are discussed in Impact Statement 5.4-2, *Long-Term Aesthetic Impacts*. "Views from west" of the project site acknowledges that the proposed marina facility would alter the visual character of the Lake by introducing a man-made structure on the lakefront and removal of several trees for parking facilities. Views from the west have been concluded as significant and unavoidable. The marina facility would also be visible from south of the project site. "Views from the south" of the project site have also been identified as significant and unavoidable. The EIR text has been revised to reflect that the marina facility would contribute to the significant and unavoidable long-term aesthetic impact for views from south of the project site.

Page 5.4-24, Paragraph 1 of the Draft EIR, has been revised in the Final EIR as follows:

> Views from the South. Views across the Lake from the south shore and the Lake itself to the north shore consist primarily of mountainsides covered in dense forest vegetation, with small areas of sporadic developed areas, such as the Community of Fawnskin. As shown in Exhibit 5.4-3, *Plan View*, the majority of the existing Jeffrey pine trees located between the high-water line of the Lake and immediately adjacent to or on the southern boundary of the project would remain. The lakefront residences, and residences to the north, would be partially screened by the existing trees when viewed from the south. The potential size and massing of residential buildings and change in visual character of the lake from the proposed marina facility (marina facility discussed in "views from west") would constitute a significant and unavoidable impact for views across the lake, from the south shore, and the lake itself to the north.

13-57 Boat storage would be the responsibility of the individual boat owner. It is unknown whether boats would be stored at an individual residence or a designated boat storage facility. Should boats be stored at an individual residence(s), the conclusion of significant and unavoidable impacts associated with the change in visual character of the site would not change.

13-58 Growth is very closely related to the economic cycle. As such, in times of a "good" economy, growth accelerates; and in a "poor" economy, growth contracts. Therefore, as the economy undergoes fluctuations that can be described as "good" and "poor" economies over time, it has been concluded that a 10-year time period is a reasonable approach to establish an annual growth rate. Also, refer to Response to Comment No. 13-2.

13-59 The weekday A.M. and P.M. peak hours in the mountains can be expected to occur between 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., respectively.

13-60 Although the mountains are subject to wet weather conditions, the standard practice for preparing a traffic impact analysis is to use dry weather conditions.

13-61 Legally, there needs to be a nexus between fees paid and a traffic-related impact. A developer cannot be required to solve existing problems, particularly when a project has an insignificant traffic impact as with the proposed project. Thus, a developer is required to pay only a pro-rata share of future traffic growth toward an improvement. Also, refer to Response to Comment No. 26-13.

13-62 The County will consider the Commentor's opinion during their deliberation on the project.

13-63 There is no justification that the proposed straightening of State Route 38 within the project vicinity will materially affect existing traffic patterns. The entire stretch of State Route 38 along the north shore of Big Bear Lake consists of many curves and it is anticipated that the proposed straightening will make little difference in choice of route. The County will consider the Commentor's opinion during their deliberation on the project.

13-64 The traffic analysis was prepared in accordance with prescribed San Bernardino County Congestion Management Program procedures. This methodology is typical for an EIR level analysis of traffic-related impacts.

13-65 The proposed improvements (i.e., straightening) to State Route 38 would be designed in accordance with all applicable design standards regarding traffic flow and safety. This would include appropriate signage to identify maximum speed limits and any potential roadway hazards. Compliance with all applicable Caltrans design standards and regulations would that potential hazards due to a design feature are reduced to less than significant levels.

13-66 The County will consider the Commentor's opinion during their deliberation on the project.

13-67 Commentor refers to the modeling process used to analyze air quality impacts associated with the Project. Please refer to Response to Comment No. 19-3, which addresses this concern.

13-68 Commentor refers to the lack of analysis of SOx, lead and toxic air contaminates in the Draft EIR. Please refer to Response to Comment No. 19-4, which addresses this concern.

13-69 Commentor refers to potential air quality impacts associated with wood smoke emissions from wood stoves and fireplaces. Please refer to Response to Comment No. 19-6, which addresses this concern.

13-70 Commentor refers to potential impacts associated with visibility reducing particles. Please refer to Response to Comment No. 19-7, which addresses this concern.

13-71 Commentor refers to potential air quality impacts to health as a result of implementing the Project. Please refer to Response to Comment No. 19-8, which addresses this concern.

13-72 Commentor refers to air quality impacts to the mortality rate as a result of project implementation. Please refer to Response to Comment No. 19-9, which addresses this concern.

13-73 Commentor refers to air quality impacts associated with toxic air contaminates. Please refer to Response to Comment No. 19-10, which addresses this concern.

13-74 Commentor refers to practicality of enforcing mitigation requiring EPA certified fireplaces. Please refer to Response to Comment No. 19-13, which addresses this concern.

13-75 Commentor refers to hydrocarbon emissions from watercraft and affects to air quality. Please refer to Response to Comment No. 19-14, which addresses this concern.

13-76 The EIR discusses the possible use of distributed generation to support peak electrical demand for the project. Distributed generation involves placing a power source (i.e., reciprocating engine that uses natural gas to power generator) on the site that would generate power on an as needed basis, such as during peak load times (i.e., winter, holiday weekends, etc.). The distributed generator would be owned by the Project Applicant and/or BVES, depending on future agreements between the Applicant and BVES. Distributed generation is discussed as an alternative only, and will be investigated further by the BVES. Should this alternative become necessary, the Applicant will have to seek out permits from the SCAQMD for siting a stationary source. Should any adverse environmental effects arise during the permitting stage, mitigation measures would be adopted as a condition of approval for any such stationary sources. Also, refer to Response to Comment No. 13-49.

13-77 The County will consider the Commentor's opinion during their deliberation on the project.

13-78 Information within Section 5.7, *Noise*, was based on the most current and up-to-date information available. The Noise section was based on the *Traffic Analysis Report*, prepared by Kunzman Associates in September 2003. Trip generation rates utilized within the Traffic Report were from the *Institute of Transportation Engineers 6th Edition Trip Generation Rates, 1997*. Traffic volumes were obtained from the weekday peak hour intersection turning movement counts conducted by Kunzman Associates in March 2001. In addition, the noise analysis was conducted in accordance with the *Noise Guidelines* provided by the United States Department of Housing and Urban Development, prepared by the Environmental Planning Division of the Office of Environment and Energy. Traffic noise modeling was performed using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108), which is the current recommended model by the California department of Transportation, Federal Highways Administration and Federal Transit Administration.

13-79 In general, in an ambient outdoor noise environment, a 3-dBA change in sound pressure levels is considered a "just detectable" difference in most situations. In a laboratory-controlled environment, a 1-dBA change in sound pressure level is detectable. Per standard acoustical practices, a 10-dBA change is considered a doubling (or halving) of the subject loudness. In terms of human response to noise, a sound must be 10 dBA or higher to have a doubling effect.[1]

13-80 Sound from a small localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates or drops-off at a rate of 6 dBA for each doubling of the distance (6 dBA/DD). This decrease, due to the geometric spreading of the energy over an ever-increasing area, is referred to as the *inverse square law*. However, highway traffic noise is not a single, stationary point source of sound and would not produce a funneling effect of noise. The movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point. This would result in a cylindrical spreading rather than the spherical spreading of a stationary point source. The change in surface area of a cylinder only increases by two times for each doubling of the radius compared to four times which is associated with spheres. The change in sound level is 3 dBA per doubling of distance (3 dBA/DD). The FHWA RD-77-108 program utilized in the analysis determined that noise from the highway would increase less than 1 dBA at a distance of 100 feet from the roadway centerline with future (Year 2006) project implementation. Additionally, refer to Response to Comment 13-82.

13-81 On page 5.7-4 of the Draft EIR, the discussion provided information regarding noise sensitive receptors within the project area and not sensors measuring sound pressure levels (SPL). According to the *General Plan Guidelines,* provided by the Office of Planning and Research, sensitive receptors include schools, hospitals, rest homes, long-term medical and mental care facilities and parks and recreation areas. Residential areas are also considered noise sensitive, especially during the nighttime hours. Section 5.7, *Noise*, indicated sensitive receptors located within a one-mile radius of the project site.

13-82 Table 5.7-2, *Land Use Compatibility for Community Noise Environments*, does not take into account noise resulting from construction. Under the County of San Bernardino Development Code, construction activities are exempt from adhering to County noise/vibration standards as long as construction is limited to the hours of 7:00 a.m. to 7:00 p.m. Monday through Saturday and prohibited on Sundays and Federal Holidays.

13-83 The noise model predicted vehicular noise in a perpendicular pattern from the roadway. Receptors located above roadways would potentially experience levels at or below the predicted noise values since a drop off effect would occur through atmospheric attenuation. In addition, the modeling for future scenarios predicted a less than 1 dBA increase in ambient noise levels for project related traffic noise. Additionally, refer to Response to Comment No. 13-80.

13-84 Please refer to Response to Comment Nos. 13-2 and 13-58 to 65. The County will consider the Commentor's opinion during their deliberation on the project.

[1] Cyril M. Harris, *Handbook of Noise Control,* 1979.

13-85 The Commentor's general comments are noted and will be considered by the County of San Bernardino. The statements used in the Draft EIR for gauging the significance of noise are based on widely accepted methodology and County Standards. These standards are considered appropriate, and even conservative.

13-86 The impact analysis within Section 5.8, *Biological Resources*, assumes removal of all vegetation types within the project site boundary. Table 5.8-4, *Vegetation Types Impacted*, states that 54.91 acres of Jeffrey pine forest would be impacted by project implementation. This acreage includes areas impacted by highway, road, residential unit construction, and fuel modification zones. Analysis of the impact of removing vegetation types, including Jeffrey pine forest, is also included in the second paragraph on page 5.8-53 of the Draft EIR. The impact to Jeffrey pine forest on the project was considered less than significant given that approximately 58,526 acres of Jeffrey pine forest presently exists in the San Bernardino National Forest and removal of 54.91 acres would not substantially reduce its range. However, impacts to individual trees used by bald eagles as perch or roosting trees were determined to be significant and unavoidable.

13-87 Comment noted. The analysis has been updated to acknowledge the osprey.

The following paragraph, to be added below Paragraph 3 on Page 5.8-39 Draft EIR, will be included in the Final EIR:

> Osprey (*Pandion haliaetus*). The osprey is a California Species of Special Concern. It is an uncommon winter visitor in southern California, but nesting has been documented at Lake Casitas near Ventura and Lake San Antonio in Monterey County (Garrett and Dunn 1981) and may occur elsewhere. The osprey would be expected to occur on the project site during spring migration or post-breeding wandering. The Project site provides roosting and foraging habitat for the osprey, but no potentially suitable nesting habitat. Therefore, its potential to occur on the Project site is considered to be low for foraging only.

Page 5.8-51 of the Draft EIR, Paragraph 4 has been revised and text has been added in the Final EIR as follows:

> Cooper's Hawk, Northern Goshawk, Sharp-shinned Hawk, Golden Eagle, Long-eared Owl, Ferruginous Hawk, Northern Harrier, White-tailed Kite, Merlin, American Peregrine Falcon, Osprey, Prairie Falcon, and California Spotted Owl. Project implementation would reduce the amount of foraging habitat for these species. This impact would contribute to the cumulative loss of foraging habitat for these raptor species. However, the loss of potential foraging habitat for these species would be considered adverse, but less than significant due to the limited amount of habitat loss relative to the availability of foraging habitat for these species in the San Bernardino Mountains and National Forest.

13-88 The EIR provides mitigation to reduce impacts to the bald eagle; however, it also maintains that impacts to the bald eagle cannot be reduced to a level considered less than significant with project implementation. No available mitigation measures could be identified that would reduce impacts to a level considered less than significant. The Draft EIR text has been revised to reflect that cumulative impacts to the wintering bald eagle population are concluded to be significant and unavoidable.

Page 5.8-62 of the Draft EIR, the Cumulative impact discussion has been revised and text has been added in the Final EIR as follows:

CUMULATIVE

5.8-6 *Cumulative development in the Project area may impact the area's biological resources. Analysis has concluded that ~~with implementation of the specified mitigation and compliance with all applicable County, State and Federal regulations concerning biological resources, a less than significant impact would occur in this regard.~~project implementation incrementally adding to impacts on bald eagle habitat in the Big Bear Valley would result in a significant and unavoidable cumulative impact to the wintering bald eagle population on Big Bear Lake.*

The proposed project contains some of the most utilized bald eagle roosting and perching habitat in the Big Bear Valley. Construction of the proposed project would diminish the habitat value of the project site for the species. When viewed in conjunction with other past, present, and reasonably foreseeable developments planned for the Fawnskin/Big Bear Lake area, the loss of bald eagle perch and roosting trees on the project site would significantly impact bald eagle habitat on the north shore of Big Bear Lake. Thus, cumulative impacts to the bald eagle are considered significant. Mitigation measures reflective of recommendations developed by scientific studies in the Big Bear Valley, including Kimball Garrett's study on the effects of human activity on wintering bald eagles (1981), are provided as part of the proposed project. However, implementation of these mitigation measures would not reduce direct or cumulative impacts to bald eagle habitat to a level considered less than significant.

~~t~~The loss of Jeffrey pine forest, pebble plain habitat and other native vegetation, as well as the loss of wildlife habitat could be considered a negative cumulative effect. However, with implementation of the recommended mitigation measures cumulative impacts to the Jeffrey pine trees would be mitigated to a less than significant level. ~~The proposed project would impact 0.69 acres of pepple plain habitat, however, implementation of the recommended mitigation measures would ensure that impacts would be reduced to less than significant levels.~~Additionally, implementation of the recommended mitigation measures would reduce impacts to 0.69 acre of pebble plain habitat to a less than significant level.

Potential impacts would be site specific and an evaluation of potential impacts would be conducted on a project-by-project basis. This would be especially true of those developments located in areas that contain sensitive species and habitat.

Each incremental development would be required to comply with all applicable County, State and Federal regulations concerning the preservation of biological resources. ~~In consideration of these regulations,~~ However, potential cumulative impacts upon ~~biological resources~~ wintering bald eagle populations would ~~not~~ be considered significant and unavoidable.

13-89 Commentor refers to removal of trees in the fuel modification zone and affects to biological resources. Please refer to Response to Comment No. 13-86, which addresses this concern.

13-90 The EIR indicates on page 5.8-49 that botanical surveys were conducted during a very low rainfall year and were inconclusive as to the presence or absence of most special status species plants with potential to occur. Additionally, the EIR states that surveys during a normal rainfall year would be required to make a determination as to the presence or absence of the species listed on page 5.8-49. Mitigation Measure 5.8-1a has been provided to ensure that a proper accounting of onsite botanical resources is completed and potential impacts are appropriately mitigated. Please also refer to Response to Comment No. 3-5.

13-91 The EIR addressed impacts to wildlife movement on page 5.8-60 and determined that impacts would be considered less than significant given that the site is not a regionally important wildlife movement corridor.

13-92 The proposed project may not proceed until implementation of Mitigation Measure 5.8-1a. The conservation easement must be purchased, the management entity approved by the California Department of Fish and Game (CDFG), and a non-wasting endowment established for the monitoring and management of the preservation site by the management entity in perpetuity prior to the initiation of clearing or grading activities on the project site. Refer to Response to Comment Nos. 3-5 and 13-86.

13-93 Commentor refers to the acreage assessment of pebble plain habitat. Please refer to Response to Comment No. 6-1, which addresses this concern.

13-94 Commentor refers to the recommended mitigation measures for impacts to pebble plain habitat. Please refer to Response to Comment Nos. 3-5, 13-86 and 13-92, which address this concern.

13-95 Mitigation Measures 5.8-1b and 5.8-1c apply to "any development that may occur within the project site," which includes road cutting and other structural changes required for the proposed project, including fuel modification. However, project-related and cumulative impacts to the bald eagle are identified as significant and unavoidable, even with implementation of the proposed mitigation. This conclusion takes into account the loss of trees for roosting and perching.

13-96 Commentor refers to impacts associated with tree removal and to the bald eagle. Please refer to Response to Comment No. 13-95, which addresses these concerns.

13-97 The Commentor is correct that Mr. Magorien has highlighted several deficiencies in the available data to indicate the presence of available water resources to serve the project. Since the available data regarding water resources at time of preparation of the EIR did not adequately prove that a reliable water resource exists to serve the project, impacts to groundwater resources have been identified as significant and unavoidable. The deficiencies highlighted by Mr. Magorien will need to be further analyzed and resolved; and a proven water resource will need to be identified to conclude that impacts to groundwater resources are reduced to a less than significant level.

13-98 The Commentor states that the EIR fails to acknowledge the conclusion in the 2003 GSS report that drought conditions will have a significant impact on groundwater levels in the North Shore and Grout Creek Hydrologic Subunits. This statement and the associated discussion in the 2003 GSS report are discussed on Page 5.11-22, Paragraph 1, of the Draft EIR. Based on the analyses presented in the 2003 GSS report, the following have been concluded regarding the maximum perennial yield of the North Shore Hydrologic Subunit:

- The North Shore Hydrologic Subunit can be conveniently subdivided into six tributary subareas (A through F) based on surface water drainage divides.
- The revised range of average annual ground water recharge for the North Shore hydrologic Subunit as a whole is approximately 150 to 430 acre-ft/yr with a midpoint of approximately 290 acre-ft/yr.
- The midpoint of the estimated range of average annual ground water recharge (290 acre-ft/yr) is considered a good estimate of maximum perennial yield for the North Shore Hydrologic Subunit, given the available data. The midpoint of the range is approximately 4.5 percent of precipitation for the subunit which is within the range of accepted recharge estimates for other ground water basins in southern California (three to seven percent; Metropolitan Water District of Southern California (MWD), 1999; Daniel B. Stevens, 1996).
- The revised perennial yield of 290 acre-ft/yr is slightly higher than the previous perennial yield value of 260 acre-ft/yr from the GEOSCIENCE, 2001 report, primarily as a result of the use of an updated EPA input parameter list for the watershed model and the consideration of the bedrock aquifer as a viable source of ground water supply.
- The maximum perennial yield for individual tributary subareas within the North Shore Subunit range from 27 acre-ft/yr (Subarea E) to 73 acre-ft/yr (Subarea B).
- Additional ground water monitoring and geohydrologic data collection are required in each individual subarea to manage the ground water resources in the area as it is developed in the future.

The results of the ground water recharge analysis for the Grout Creek Subunit are as follows:

Summary of Ground Water Recharge Results
Grout Creek Tributary Subareas

Tributary Subarea	Area (acres)	Annual Precipitation (inches)	Average annual Ground Water Recharge - Low Estimate (acre-ft/yr)	Average Annual Ground Water Recharge – High Estimate (acre-ft/yr)	Average of Ground Water Recharge Estimate Range (acre-ft/yr)
A	1,074	33.44	74	249	161
B	850	29.01	50	160	105
C	1,668	29.93	104	331	217
D	592	26.74	32	99	66

For the Grout Creek Hydrologic Subunit, the following is concluded:

- The Grout Creek Hydrologic Subunit can be conveniently subdivided into four tributary subareas (A through D) based on surface water drainage divides.
- The revised range of average annual recharge for the Grout Creek Hydrologic Subunit as a whole (Tributary Subareas A through D) is approximately 260 to 840 acre-ft/yr with a midpoint of approximately 550 acre-ft/yr. However, ground water resources in Subareas A and B of the Grout Creek Subunit are not currently practical to develop because they are remote and are located on land under the jurisdiction of the USFS.
- Due to the cost and political limitations associated with ground water development in Subareas A and B, it is currently recommended to use the sum of the midpoint recharge estimates for tributary Subareas C and D as the maximum perennial yield for the Grout Creek Subunit. This results in a maximum perennial yield for the Grout Creek Subunit of 283 acre-ft/yr.
- The revised perennial yield is higher than the previous perennial yield value of 200 acre-ft/yr from the GEOSCIENCE, 2001 report, primarily as a result of the use of an updated EPA input parameter list for the water shed model and the consideration of the bedrock aquifer as a viable source of ground water supply.
- The maximum perennial yield for individual tributary subareas within the Grout Creek Subunit range from 66 acre-ft/yr (Subarea D) to 217 acre-ft/yr (Subarea C).

Mitigation Measure 5.11-2 on Page 5.11-27 of the Draft EIR has been revised in the Final EIR as follows:

~~5.11-2 Based upon the technical analysis presented, a potential groundwater overdraft condition would occur and no additional mitigation measures have been identified.~~

5.11-2a Within three months of project approval, the Project Applicant shall submit a plan for a detailed geohydrologic investigation. The plan must present the possible sources of groundwater selected for the project and the methodology proposed to investigate those sources. If the on-site wells are to be utilized to serve this project, it must be determined if either could draw water from Big Bear Lake. The plan must be prepared by a California Registered Geologist.

5.11-2b Within six months of plan approval, the Project Applicant shall submit the results of the geohydrologic investigation. The report must be prepared by a California Registered Geologist.

5.11-2c Concurrently or within three months of approval by the geohydrologic report, the Project Applicant shall submit a groundwater monitoring plan in accordance with San Bernardino County's "Guidelines for Preparation of a Groundwater Monitoring Plan." The plan must be prepared by a California Registered Geologist.

13-99 Section 5.11, *Hydrology and Drainage*, discusses impacts associated with short- and long-term water quality. Overall, the project has the potential to violate water quality standards of the lake due to an increase in the level of activity on the project site. Without mitigation, the project would be expected to increase pollutant loadings, including hydrocarbons, fertilizers, and pesticides in the lake. However, the recommended mitigation that includes a comprehensive Water Quality Management Plan (WQMP) for Urban Runoff, including both Structural and Non-Structural BMPs, to comply with the requirements made by the Santa Ana Regional Water Quality Control Board, would reduce potential water quality impacts to the lake to a less than significant level.

13-100 The Commentor is correct that the Initial Study prepared for the project indicated that no impact to groundwater resources would occur as a result of project implementation. This conclusion was based upon available data (which was limited) at the time of preparation of the Initial Study (2001). Since that time, wells in the project vicinity have been considered as an option to supply the project with water. Thus, the EIR appropriately analyzes the potential impacts to groundwater resources in the North Shore and Grout Creek Hydrologic Subunits. The analysis concludes that significant and unavoidable impacts would occur to groundwater resources in the North Shore and Grout Creek Hydrologic Subunits, since no proven source of water supply has been provided in the technical analysis provided by the Project Applicant.

13-101 The EIR text has been revised to clarify that according to data from the 2000 GSS report, groundwater quality from Well FP-2 is "generally" of superior water quality. All concentrations were below maximum contaminant levels (MCLs), with the exception of iron with a concentration of 0.69 mg/L.

The following paragraph, to be added below Table 5.11-3 on Page 5.11-8 of the Draft EIR, will be included in the Final EIR:

GROUNDWATER QUALITY

According to the GSS 2000 Report, groundwater samples collected from Well FP-2 located on the southern portion of the Moon Camp site in 1987 was submitted for a full Title 22 analysis. The chemical analysis indicated that the groundwater quality in the Moon Camp area is calcium bicarbonate and is generally of superior water quality as all concentrations were below maximum contaminant levels (MCLs), with the exception of iron with a concentration of 0.69 mg/L. The MCL for iron is 0.3 mg/L. However, the iron concentration of Well-FP-3 (located approximately 800 feet to the northeast of Well FP-2) was only 0.06 mg/L, which suggest that iron concentrations are possibly lower elsewhere.

13-102 The County will consider the Commentor's opinion during their deliberation on the project.

13-103 The County will consider the Commentor's opinion during their deliberation on the project.

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BIG BEAR GROUP

May 16, 2004

Matthew W. Slowik
Land Use Services Department
Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIESS INC. GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BVRS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #1636, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Mr. Slowick,

The Sierra Club , Big Bear Group, appreciates the opportunity to comment on the DEIR referred to above. The following are a just a few of the objections we have to the proposed project.

First and foremost, under "Land Use Element", section LU-2, (a), this project does not ensure compatibility with adjacent land uses and community character. The community of Fawnskin has no projects resembling anything of this size. The adjacent land is Forest Service single family lots and homes. The changing of zoning from R40 would alter the atmosphere of the whole community adversely. 14-1

Section 5.3-9 lists the alternative of a distributed generation option. This would require additional construction, and does not address the fact that such an option would create noise pollution as well as air pollution and be disruptive to neighbors and wildlife. 14-2

Section 5.3-10 states "The inability of water providers to confirm service on a project level would also result in significant and unavoidable cumulative impacts." This is a 14-3

problem that can't be solved or mitigated and should be reason enough for rejection of the project as proposed. 14-3

The conclusion in Section 5.4-2 is correct and good reason why the project should not be approved as proposed. 14-4

Section 5.8 has too many omissions to document here, but my biggest concern is that it did not properly address the Bald Eagle population and its impacts and completely omitted the Osprey, which in recent years has been returning to the area. 14-5

In conclusion, we feel the EIR is inaccurate and incomplete. Thank you for allowing us to express my concerns.

Sincerely,

Ervin Nichols, Chairman,

Big Bear Sierra Club Group

Response to Commentor No. 14
Ervin Nichols, The Sierra Club
May 14, 2004

14-1 Commentor refers to the Project's consistency with the County General Plan. Please refer to Response to Comment No. 13-20, which addresses this concern.

14-2 Commentor refers to the potential impacts as a result of constructing an alternative electrical power source on the project site. Please refer to Response to Comment No. 13-49, which addresses these concerns.

14-3 The County will consider the Commentor's opinion during their deliberation on the project.

14-4 The County will consider the Commentor's opinion during their deliberation on the project.

14-5 Commentor refers to impacts to the bald eagle and osprey. Please refer to Response to Comment Nos. 3-7, 13-87 (osprey), 13-88, 13-95 and 41-14, which address these concerns. The County will consider the Commentor's opinion during their deliberation on the project.

BBSO
Big Bear Solar Observatory

New Jersey Institute
of Technology
A Public Research University

Big Bear Solar Observatory
40386 North Shore Lane
Big Bear City, CA 92314
FAX: 909-866-4240

May 17, 2004

County of San Bernardino
Land Use Services Department
Planning Division
385 N. Arrowhead Ave. First Floor
San Bernardino, California 92415-0182
Attn: Matthew Slowik, Sr. Associate Planner

Dear Mr. Slowik:

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR RE-ALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Thank you for the opportunity to review and comment on the draft EIR for the proposed Moon Camp project. The Big Bear Solar Observatory, operated by the New Jersey Institute of Technology, a public research university of the state of New Jersey, is one of the leading solar observatories in the world. We have serious concerns that a number of aspects of the proposed Moon Camp project may adversely affect our research programs. We are somewhat surprised that during the preparation of the DEIR we were not contacted for input. Specifically, our concerns include the following: 15-1

- Dust generated during construction. We are primarily concerned with generation of PM_{10} and $PM_{2.5}$. Although these particles do remain in the air for long distances from a source, they are most prevalent near the source. PM_{10} particles will increase scattered light in our telescopes by settling on exposed lenses and mirrors, while $PM_{2.5}$ particles contribute to scattering ("haze") in the atmosphere. We are concerned that the mitigation measures listed in section 5.6-1 of the DEIR may not be adequate. 15-2
- Dust generated by traffic after project completion. Our concerns are basically the same as during construction. 15-3

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- Smoke from wood stoves and fireplaces. Again, our concerns are mainly due to the increased levels of PM_{10} and $PM_{2.5}$ in the vicinity of the project. It should be noted that the winter inversion layers already tend to trap smoke from the city of Big Bear Lake, across the lake from the proposed project, in the mornings. Mornings are particularly important for our observations since the air is less turbulent at that time. 15-4

- Thermal convection from house roofs. This is not addressed by the DEIR. The major limitation to the resolution of ground-based telescopes is distortion caused by air turbulence. In the daytime, the largest contribution to this is the heating of the ground and other surfaces by the sun. The reduction of this turbulence by large bodies of water is the main reason why the Observatory is located in Big Bear Lake. In general, building roofs and asphalt and concrete paved areas are the worst sources of ground heating. Replacement of a large forested area near the Observatory by homes is likely to have detrimental effects on our ability to see detail on the sun. 15-5

- Light pollution and trespass. The Observatory also operates a long term program monitoring the earth's climate by measuring the earth's reflectance by observing the earthshine, that is, the light reflected from the earth to the moon and back. This project is primarily concerned with measuring the overall reflectivity of clouds in the earth's atmosphere. Cloud reflectivity is an important factor in determining the nature and extent of global warming.
  Light pollution and trespass from the proposed Moon Camp project may adversely affect our ability to continue this project. The mitigation measures in section 5.4-4 may not be sufficient to prevent interference with our observations. We would recommend that in addition to the measures in 5.4-4, the following measures should be added: All outdoor light fixtures should be cutoff luminaires, and should only use high-pressure or low-pressure sodium lamps. 15-6

We would like to point out that Big Bear Solar Observatory represents an important non-tourist related contribution to the economy of the Big Bear Valley. Degradation of observing conditions here could have long-term effects on the economy of this area.

Thank you again for allowing us to comment on this proposed project.

Sincerely,

Philip R. Goode
Director
Big Bear Solar Observatory

William H. Marquette
Site Director
Big Bear Solar Observatory

John R. Varsik
Assistant Research Professor
Big Bear Solar Observatory
New Jersey Institute of Technology

Response to Commentor No. 15
Phillip R. Goode, William H. Marquette, and John R. Varsik, Big Bear Solar Observatory (BBSO)
May 17, 2004

15-1 The County will consider the Commentor's opinion during their deliberation on the project.

15-2 Per Impact Statement 5.6-1 – *Short Term Air Quality Impacts*, the analysis states that the project shall comply with the South Coast Air Quality Management District Rule 403, *Fugitive Dust*. Article (d)(1) states that:

> *No person shall cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area such that:*
>
> *(A) the dust remains visible in the atmosphere beyond the property line of the emission source; or*
> *(B) the dust emission exceeds 20 percent opacity (as determined by the appropriate test method included in the Rule 403 Implementation Handbook), if the dust emission is the result of movement of a motorized vehicle.*

Additionally, as the project site is in excess of 50 acres and construction would occur after January 2005, it must also comply with the Best Available Control Technology (BACT) measures outlined in Section 5 of Rule 403. Implementation of the above referenced measures during construction and operation would ensure that there would not be an abundance of particulate matter emitted beyond the property line. Therefore, particulate settlement beyond normal ambient conditions on the Big Bear Solar Observatory (BBSO) telescope lens is not anticipated.

15-3 Commentor refers to dust generated by traffic and affects to air quality. Please refer to Response to Comment No. 15-2, which addresses this concern.

15-4 Please refer to Response to Comment No. 15-2.

15-5 The enhanced greenhouse hypothesis indicates that thermal convection within a high altitude climate will manifest itself at higher minimum nocturnal and winter temperatures (effect on maxima is small to non-existent because pushing more energy into a warm air mass increases vibrational excitation, reduces air density to the point that overcomes earth's natural inversion layer and cooler, more-dense air above displaces less-dense warm air, convection takes over and, via a chaotic exchange, thermal energy is vented to space - i.e., hot air rises). However, to further reduce any adverse effects that may arise from thermal convection from roofs to homes, an additional mitigation measure has been proposed.

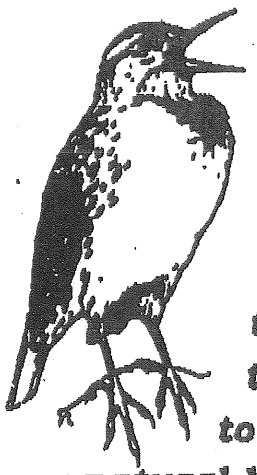
Page 5.4-29 of the Draft EIR, the following mitigation measure has been added in the Final EIR as follows:

5.4-4g	The Project Applicant/Developer shall install light colored, reflective roof products. Such roofs shall utilize light colored, reflective materials that meet the performance standards developed by the Energy Star Labeled Roof Program, as well as the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standards 90.1 and 90.2 on energy efficient buildings. This condition shall be verified by the County of San Bernardino Building and Safety Division prior to issuance of building permits.

15-6 The BBSO has recommended that all outdoor light fixtures should be cutoff luminaries and should only use high-pressure or low-pressure sodium lamps. The EIR has been modified to include this suggestion as a recommended mitigation measure to further reduce potential light and glare impacts associated with the proposed project. Also, refer to Response to Comment No. 13-52.

Page 5.4-29 of the Draft EIR, the following mitigation measure has been added in the Final EIR as follows:

5.4-4f	All outdoor light fixtures shall be cutoff luminaries and shall only use high- or low-pressure sodium lamps.



San Bernardino Valley AUDUBON SOCIETY

P.O. Box 19973 San Bernardino, CA 92423

to enjoy
to study
to protect
our natural heritage

May 17, 2004

Matt Slowik, Senior Associate Planner
COUNTY OF SAN BERNARDINO
Land Use Services Department, Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RE: Draft Environmental Impact Report for the MOON CAMP Development Project / RCK Properties Inc.; General Plan Amendment -Official Land Use District Change from BV/RL-40 to BV/RS-7200 and Amendment to County Circulation Element for Realignment of North Shore Drive; Tentative Tract Map #16136; and Conditional Use Permit for a Marina.

Dear Mr. Slowik,

The *San Bernardino Valley Audubon Society* appreciates the opportunity to comment on the Draft Environmental Impact Report referenced above for the Moon Camp Development Project and marina in Fawnskin plus the accompanying General Plan Amendment for increased density in land use designation and the proposed highway realignment.

The San Bernardino Valley Audubon Society represents approximately 2000 citizens living in the Inland Empire. Together with our members who actually reside in the mountains, all of us look to the San Bernardino National Forest as a monumental public asset, a one-of-a-kind forest sanctuary that offers refuge, recreation and spiritual renewal to anyone who wishes to enjoy its rare and valuable alpine qualities. When actions are proposed that threaten to sacrifice these advantages unnecessarily and unjustifiably, we feel an obligation to speak up on behalf of the general populace and against potential giveaways that primarily favor private gain at public expense.

We believe that the severity of adverse impacts resulting from the combined proposals of this project would be extremely detrimental to the community of Fawnskin, the Big Bear Valley, the San Bernardino National Forest and the general public. Given the present emergency crisis of severe fire hazard in the mountain region, overdraft of water resources, insupportable infrastructure, public safety risk from limited evacuation capability and excessive fragmentation of wildlife and National Forest resources, this project deserves to be denied so that a clear message is registered that important public values will not be compromised in the County of San Bernardino. 16-1

1

Major Adverse Impacts

Without going into extensive detail, there are several elements of this proposal that by themselves are sufficient to warrant denial due to overall inappropriateness, conflict with County General Plan guidelines and incompatibility with primary public values.

In this context we would like to address the proposed General Plan Amendment for a land use designation change, the proposed highway realignment, impacts to the bald eagle, cumulative effects and the unprecedented fire danger. 16-1

We acknowledge our gratitude to the Friends of Fawnskin, a local community organization, for sharing their research and a copy of their extensive comments with us. The County is indeed privileged when local citizens care enough to participate to such an earnest extent in the planning process. We find that their comments are thoroughly researched, valid and compelling. We concur wholeheartedly with their conclusion that the project is unsound and detrimental.

General Plan Amendment

As acknowledged in the Draft Environmental Impact Report, the proposed Moon Camp Project is in conflict with the County of San Bernardino's land use plan, policies and regulations set forth in the General Plan and requires a General Plan Amendment to offset the existing conflict and actively confer special advantages to the applicant. These special advantages can only be granted at significant expense and detriment to the public. For this reason the proposed General Plan Amendment should be denied. We strongly disagree with the analysis in the Draft EIR that changing the existing land use designation to accommodate a major development would result in a less than significant impacts to the surrounding community, the San Bernardino National Forest, environmental quality, public resources, public values and public rights. 16-2

The proposed General Plan Amendment to change the land use designation from BV/RL-40 to BV/RS-7200 is insupportable in view of the extreme fire danger in the San Bernardino Mountains. Right now there is a declared state of emergency in the mountain region due to the excessive fire hazard. The California Department of Forestry and Fire Protection indicate that these mountains face the most severe fire conditions in the world. The recent Old Fire vividly demonstrated that present firefighting capabilities are insufficient to defend existing structures on the mountains much less any additional structures, especially ones unauthorized by existing General Plan guidelines. 16-3

Fire danger cannot be expected to decrease in the foreseeable future. These facts ought to preclude any further mountain development that is not already prescribed in the General Plan. Each additional structure added to the hazardous mountain environment worsens the already out of balance ratio of urban-to-wildland intermix. Defending a disproportionate urban-to-wildland intermix is the most costly and difficult firefighting condition of all. Given such circumstances, a 16-4

hypothetical General Plan Amendment designed to enable only five additional structures where current provisions allow only 1.5 would be irresponsible and a tragic disservice to the public. The prospect of relaxing zoning restrictions to allow 60 or 90 units and the accompanying increase in population would be unconsciencable. 16-4

The owners acquired this land in full knowledge of its zoning restrictions. They have no right to expect a change when such a change would not be in the public interest. Depriving the public of their open space rights, General Plan protections, fire safety, aesthetics and other general rights conferred by existing planning would be unfair and unwarranted under the circumstances. Ceding to a private request solely for the purpose of private gain accomplished entirely at the public expense and loss should not be considered. 16-5

Moreover a change in the land use designation cannot be justified on the grounds that adjacent property is approved for higher residential densities. In actual fact the majority of the adjacent land is National Forest and shoreline within the scenic corridor of the scenic highway. Compatibility with such valuable open space values strongly argues for the maintenance of the existing zoning at one unit per 40 acres.

Proposed Highway Realignment

The scenic highway and lake view on the predominantly woodland north shore of Big Bear Lake in conjunction with the curving contour of the roadway conform to the rural character of the Fawnskin community's alpine setting. Straightening and realigning the highway to enable shoreline houses would nullify and defeat the purpose of the scenic highway and the protections of this public benefit upheld in the County General Plan. This would constitute an extreme adverse impact and should clearly be disallowed.

Furthermore, straightening the highway would likely create an unnecessary speed strip in an otherwise meandering alignment that encourages slow travel along the scenic shoreline. Public meetings held in the Big Bear Valley to gather community input for a new County General Plan Revision indicate an overwhelming preference for maintaining the open space and rural character of the mountain region by avoiding discretionary actions that compromise these qualities. Realigning the highway is counterproductive for maintaining these values. 16-6

By proposing the zoning change and the highway realignment, the applicant is essentially asking the County to conspire against the public interest by taking away long established public rights and bestowing upon the applicant vastly extended new rights and a major magnification of property values, which the applicant has no claim to unless the County dishonors its existing commitment to the public as upheld in the General Plan and the established land use designation.

By paying property taxes based on the existing land use designation of one unit per 40 acres with a scenic highway (protected by the County General Plan) traversing the land and no building sites obstructing the public's view of the lake, the applicant has duly acknowledged the

special public rights that adhere to this land. It would be inappropriate for the County to cancel these rights when the public has clearly demonstrated its interest in preserving them. The scenic open space land owned by the applicant is linked to the National Forest, which provides the main public value and major attraction of the north shore, and is also important bald eagle habitat. The larger value of the overall public forest, for which the County General Plan mandates compatible uses on adjacent private land, clearly ought not to be diminished so extensively and simply for the purpose of facilitating private gain as this proposal seeks. The applicant has no basis to expect the County to accede to such demands. That would be a major "taking" of significant public rights in the form of an unjustified giveaway, unduly bestowing extravagant favoritism and unfair advantages to a private party. It would be highly inappropriate for the County to allow the applicant to capitalize at public expense. The most reasonable response is for the County to deny this project. 16-6

Bald Eagles

Recent increased development in the Big Bear Valley has corresponded with a simultaneous decline in the population of wintering bald eagles that inhabit the area. In addition to being the national bird, the bald eagle has also come to symbolize the unique wildlife values of the Big Bear Lake area in the San Bernardino National Forest. Beyond its importance as a threatened species, the presence of the bald eagle in Big Bear is a popular attraction for the visiting public, widely featured in media publications. Such attention is a considerable benefit to the tourist economy that thrives on a major destination like the National Forest. The Forest Service Discovery Center on the north shore is the main visitor center for the local mountains. Eagle tours are the primary attraction in winter. The health and sustainability of the bald eagle is a critical indicator of the overall natural resource values of the National Forest in the Big Bear Lake area. 16-7

The Moon Camp site is important roosting habitat for the remaining bald eagle population in the Big Bear area. It is clear that the proposed project, dependent upon approval by the County of a radical zoning change and relocation of the scenic highway would have a significant adverse effect on this species. The quantity of trees that would need to be removed for the extensive building and road construction proposals would severely compromise the viability of the existing habitat and likely compound the factors causing the population of the bald eagle to decline. We strongly recommend that the project be denied as being incompatible to the established values of the site, among which we count the extraordinary presence of the magnificent bald eagle as one of the most exceptional and irreplaceable. It would be a tragic loss if the largest population of wintering bald eagles in Southern California were allowed dissipate due to unwarranted projects like this.

Cumulative Impacts

The mountain area of the San Bernardino National Forest and the general public has suffered enormously in prior years by the County failing to adequately take into consideration the 16-8

cumulative impacts of persistent development. This has led to overdraft of water supplies in the Big Bear Basin and water shortages in the Lake Arrowhead area. Waste water treatment facilities are routinely located on pubic lands of the National Forest. Infrastructure in general is pushed to insupportable levels so that taxpayers are eventually forced to underwrite the cost of improvements necessitated by poorly planned developments, which steadily downgrade the basic quality of life of the rural setting within the National Forest. The proposed project is no exception. 16-8

The Draft EIR for the Moon Camp Project raises many red flags, which are extensively referenced in comments from the Friends of Fawnskin. As is abundantly clear in the DEIR and the additional analysis of FOF, the project will generate serious adverse impacts to aesthetics, air quality, biological resources, hydrology, public services, traffic and fire hazard. It is surprising that the DEIR has failed to recognize the "No Project/Existing Designation" Alternative as the environmentally superior alternative, insofar as it clearly meets this criteria and the applicant clearly has no inherent right to develop the land to the extent that is proposed. 16-9

The cumulative impacts assessment in the DEIR, despite its deficiencies, particularly strikes a strong cautionary note in recognizing that the proposed project could result in increased demand for public services, which typically means higher taxes for existing residents. It also acknowledges that the inability of water providers to confirm services has a significant adverse effect. This fact in conjunction with the severe overdraft in the Big Bear Basin is ample reason to deny the project. This is especially true insofar as the County has never properly analyzed the potential for the increased conversion of second homes into full-time occupancy and the resulting impacts to existing infrastructure, which have hitherto been largely predicated on the basis of a second home resort community. Proposals such as the Moon Camp Project likely will have a significant impact in accelerating the overall conversion of the community to a primary resident population. This creates significant conflicts with prior planning assumptions, density projections and land use designations. None of this has been addressed by the County in relationship to growth inducing trends, impacts to the National Forest, carrying capacity of the mountain infrastructure, projected build-out and the previously unforeseen fire hazard crisis. In view of so many unpredictable variables and existing excessive demands on infrastructure, it is wise not to amend the General Plan in a way that would only make conditions worse. 16-10

Fire Hazard

To further elaborate on the existing fire hazard in the San Bernardino Mountains and the continuing emergency crisis of drought, excessive fuels and savage winds, it is one of the glaring deficiencies of land use planning for the mountain region that realistic precautions against a major fire catastrophe, which presents a much greater threat to public safety than the County recognizes, has been overly neglected. This is especially alarming in view of the fact that the County appears to accept no liability or accountability for decisions that compromise public safety on such a large scale. 16-11

The situation is rendered unreliable and unpredictable due to the overlap of firefighting jurisdictions and responsibilities. Although the County makes decisions placing excessive numbers of structures inside the urban-wildland intermix of the National Forest, the responsibility of fighting wildland fires largely falls to the Forest Service and CDF. To some extent the County accepts responsibility for defending structures from fire, but the overlapping jurisdictions are subject to many fluctuations. For example both the Forest Service and CDF have obligations to fight fires in other areas. That means there are times when the San Bernardino Mountains will be less protected than others. As more and more second homes convert to full-time occupancy, the population will significantly increase. More people mean more ignition sources, as the majority of fires are started by human actions. Incidence of arson is increasing for this reason. None of these considerations have been properly addressed by the County. Most fire professionals will attest that the likelihood of a major wildfire is all but inevitable. Elements such as extreme combustible fuels, annual gale force winds, dangerous roads subject to closure, arson activity and firefighters dispersed to cover other emergencies, make these mountains highly susceptible to a catastrophic incident that would overwhelm existing capabilities to defend existing communities, let alone build-out densities or a conversion from second homes to full-time populations. Given such extreme hazardous conditions, an existing emergency crisis and the recent harrowing example of the Old Fire, which caused unprecedented destruction, there can be no excuse for compounding this situation unnecessarily. Any action other than denying the proposed project would be irresponsible. 16-11

The County should not ignore the guidelines in the General Plan that prescribe the use of open space as a protective fire hazard reduction method. The existing land use designation for the project site fulfills that purpose and should not be removed.

Citizen Participation

The San Bernardino Valley Audubon Society again acknowledges the tremendous effort of the Friends of Fawnskin in thoroughly and accurately evaluating the significant impacts of the Moon Camp proposal. The high level of public participation and input focused on this inappropriate proposal represents an extraordinary demonstration of community concern and citizen democracy in action. The County should feel honored and humbled by such dedication and commitment by its residents. 16-12

The County would be remiss not to assign the highest consideration to the powerful message of the exceptional participatory democracy in this case. Such a level of involvement by ordinary citizens in today's world signals that a serious problem and concern is at stake. The enormous organizational efforts of dozens of active members and hundreds of supportive followers bespeaks of exceptional commitment to the values of the local community, the County and the National Forest. Citizens of this nature are a unique asset to any County that truly values its human resources and the best interests of the public.

The extraordinary amount of volunteer hours, research and consultation with experts that has been mustered to oppose the misguided proposals of the Moon Camp Project represent a far worthier and more reliable testimony to the adverse impacts of this project than does the Draft EIR. Certainly equivalent amounts of time, expertise and expense as went into the EIR have likewise been invested by citizens in the cause of placing before the County a strong and irrefutable case that the existing General Plan guidelines ought to be adhered to and not reversed, thus aiding the County in making the right decision. Maintaining the status quo is in the best interest of the public, for its safety, well-being and continued protections of a priceless National Forest. The County could not ask for better advocates and reminders of its highest duty. 16-12

For all of the above reasons, the San Bernardino Valley Audubon Society strongly encourages the County to deny the Moon Camp Project proposal.

We thank you for your consideration of these comments.

Sincerely,

Dorothy Myers
President

7

Response to Commentor No. 16
Dorothy Myers, San Bernardino Audubon Society
May 17, 2004

16-1 The County will consider the Commentor's opinion during their deliberation on the project.

16-2 Commentor refers to the Project's consistency with the General Plan. Please refer to Response to Comment Nos. 13-8 to 13-22, which address this concern.

16-3 Commentor refers to fire risks associated with project implementation. Please refer to Response to Comment Nos. 4-1, and 13-27 to 13-36, which address this concern.

16-4 Commentor refers to the urban/forest interface and the increased fire risk associated with project implementation. Please refer to Response to Comment Nos. 4-1, and 13-27 to 13-36, which address these concerns.

16-5 Commentor refers to the Project's consistency with the General Plan. Please refer to Response to Comment Nos. 13-9 to 13-22, which address this concern. The County will consider the Commentor's opinion during their deliberation on the project.

16-6 Commentor refers to impacts associated with the proposed highway realignment. Please refer to Response to Comment Nos. 13-12, 13-16, 13-20 and 13-21, which address land use concerns. Also, refer to Response to Comment Nos. 13-51 to 13-57, which address aesthetic concerns; refer to Response to Comment No. 13-65 for traffic concerns; and Response to Comment Nos.13-95 and 13-96, which address bald eagle concerns. The County will consider the Commentor's opinion during their deliberation on the project.

16-7 Commentor refers to impacts to the bald eagle. Refer to Response to Comment Nos. 3-7, 13-86, 13-88, 13-95 and 41-14, which address these concerns. The County will consider the Commentor's opinion during their deliberation on the project.

16-8 Commentor refers to water supply and cumulative affects to groundwater. Refer to Response to Comment Nos. 1-4 and 1-5, which address this concern. The County will consider the Commentor's opinion during their deliberation on the project.

16-9 The "No Project/Existing Designation" Alternative would eliminate and/or reduce all environmental impacts from those anticipated for the proposed project. However, this alternative is not being considered as the "Environmentally Superior Alternative" for the reason that it does not meet the objectives established for the proposed project.

16-10 The Commentor is not specific, as to how the project would impact public services and infrastructure. The Draft EIR concluded that project implementation would result in unavoidable significant impacts regarding groundwater resources. Full-time occupation of the proposed residences is addressed in Response to Comment No. 13-7. The County will consider the Commentor's opinion during their deliberation on the project.

16-11 Commentor refers to potential fire hazards associated with project implementation. Please refer to Response to Comment Nos. 4-1, and 13-27 to 13-36, which address these concerns. The County will consider the Commentor's opinion during their deliberation on the project.

16-12 The County will consider the Commentor's opinion during their deliberation on the project.

RECEIVED 4/11/94
APR
LAND DEPT.
ADVANCE DIVISION

I am writing to protest
the Draft EIR for the
Mooncamp Development Project
RCK Properties Inc. I live
on Barbara Lee Lane and do
not see how "private enterprise"
can have the scenic hwy 38
realigned (North Shore Drive) on
the tentative tract map # 16136.
The boat docks go in just as
the road sits now - there
is a marina next to it
now which was Cluster Pines -
This is a small community
+ we cannot water our
lawns because of water shortages,
now + sewer problems now
crowd schools the Eagles line
in this area along with other
wild life. You should come up
here + see this beautiful little town
+ you wouldn't want this - The Almighty
Dollar is that what it is Again
Betty Conroy (owner)

17-1

I have lived in Fawnskin 34 years & love it - Our North Shore Drive is beautiful to drive to Big Bear Lake we can see the lake in all its splender, Please do not let the "almighty Dollar" ruin a beautiful place.

17-1

Where is the water going to come from ? ? ?

Betty Conroy
39554 Barbara Lee Lane
P.O. 165
Fawnskin, Ca
92333

Response to Commentor No. 17
Betty Conroy
April 11, 2004

17-1 The Commentor has provided general comments regarding water shortage, schools, biological resources (eagles), and aesthetics (i.e., visual character, scenic highway) without specific references to the EIR analysis. Refer to Response to Comment Nos. 1-1 to 1-5 for impacts regarding water resources. The County will consider the Commentor's opinion during their deliberation on the project.

PEG ALLEN
P.O. BOX 23
FAWNSKIN, CA 92333
(909)878-4028

MR. MATTHEW W. SLOWIK
COUNTY OF SAN BERNARDINO
LAND USE SERVICES DEPARTMENT, PLANNING DIVISION
385 N ARROWHEAD AVE. FIRSR FLOOR
SAN BERNARDINO, CA 924105-0182

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE: TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

THANK YOU FOR THE OPPORTUNITY TO REVIEW THIS DOCUMENT. I, AS A HOME OWNER IN FAWNSKIN, OPPOSE THIS MOON CAMP PROJECT AS IT IS PRESENTLY PROPOSED BECAUSE THE DEIR FAILS TO ADEQUATELY EVALUATE THE TRUE IMPACT THIS PROPOSED PROJECT WOULD HAVE ON MY COMMUNITY.

MY HUSBAND AND I MOVED HERE TO GET AWAY FROM THE HUGE DEVELOPMENTS. THIS PROPOSED DEVELOPMENT WOULD TURN OUR SMALL FAWNSKIN INTO A NEWPORT BEACH. I HAVE SOME VERY BIG CONCERNS ABOUT THIS PROPOSED PROJECT.

WE ARE NOW AT STAGE 2 FOR WATERING. THERE ARE MILLIONS OF DEAD TREES ALREADY IN THE FOREST. IF THEY CONTINUE TO CUT OUR WATERING TIME, THE TREES ON MY PROPERTY WILL ALSO DIE. THERE ISN'T ADEQUATE WATER FOR THE PEOPLE WHO ALREADY LIVE HERE, HOW CAN THIS PROPOSED PROJECT ALOWING 92 MORE HOMES NOT MAKE OUR WATER SHORTAGE EVEN MORE SEVERE. THE DEIR IS DOWNPLAYING THE DROUGHT SITUATION. AS CURRENT HOME OWNERS WE ARE SUPPOSED TO JEPORDIZE OUR TREES SO A HUGE DEVELOPMENT CAN CONSUME THE WATER THAT SHOULD BE OURS. I DON'T THINK SO. A FEW HOMES BUILT AS SPECIFIED WITHOUT RE-ZONING WOULD BE ACCEPTABLE.
SPEAKING OF WATER, WHAT OF A FOREST FIRE. WATER IS NEEDED. THAT WATER WOULD COME FROM OUR DWINDLING WATER SUPPLY. 18-1

THE PROPOSAL TO STRAIGHTEN THE HIGHWAY FOR SAFETY SAKE IS RIDICULOUS. THE CURVED ROAD KEEPS THE SPEED DOWN. WITH A STRAIGHT HIGHWAY THERE WOULD BE A LOT MORE SPEEDING THROUGH THE AREA. 18-2

THERE ARE A COUPLE OF TREES IN THE MOON CAMP AREA THAT THE EAGLES SIT IN DURING THE WINTER. I LEAVE EARLY FOR WORK AND AT LEAST THREE TIMES A WEEK THE EAGLES ARE IN THESE TREES. THE NEW PROPOSAL DOWNPLAYS THE IMPORTANCE OF KEEPING THIS AREA IN TACT FOR THESE EAGLES. I WAS TOLD THAT AROUND 700 TREES WOULD BE ELIMINATED IN THE MOON CAMP AREA. THESE WOULD BE BOTH ALIVE AND DEAD TREES THAT WOULD BE FELLED. AS IT IS, THERE ARE 9 MILLION TREES IN OUR FOREST THAT ARE DEAD AND NEED TO BE ELIMINATED. FELLING TREES WHICH ARE NOT DEAD JUST TO SATISIFY SOMEONES GREED FOR BUILDING A HUGE DEVELOPMENT IS DISGUSTING. 18-3

WE IN FAWNSKIN WOULD NOT OBJECT TO KEEPING THE ZONING AS IS AND BUILD A FEW HOMES AS CURRENTLY ZONED FOR.
WE OBJECT TO THESE HUGE TRACTS WHICH DESTROYS THE PEACE AND TRANQUILITY OF OUR TOWN AS IT NOW IS. 18-4

WHEN THE ROAD IS CLOSED OVER THE DAM, ALL THE TRAFFIC WILL COME THROUGH FAWNSKIN. THIS WILL CAUSE MAJOR TRAFFIC PROBLEMS WITHOUT THE MOON CAMP DEVELOPMENT. I EXIT ONTO NORTH SHORE FROM CANYON. IF I HAD TO EVACUATE, IT WOULD BE NEXT TO IMPOSSIBLE TO GET OUT ONTO NORTH SHORE OR GET DOWN THE HILL. THE LAST EVACUATION TOOK 4 TO 5 HOURS TO GET TO LUCERNE VALLEY. WITH THIS MOON CAMP DEVELOPMENT, THERE WOULD BE MORE TRAFFIC AND IT WOULD TAKE LONGER TO EVACUATE. 18-5

WE ARE ALREADY HANDLING SHORTAGES IN ELECTRICITY. JUST LIKE THE WATER SITUATION, WE DO NOT RECEIVE ANY HELP FROM DOWN THE HILL. THE DEIR HAS DOWNPLAYED THE SIGNIFICANCE OF ADDED STRAIN ON OUR POWER SOURCE. WE HAVE HAD SEVERAL BROWN OUTS AND COULD EXPECT MANY MORE WITH THE ADDED STRAIN FOR MORE ELECTRICITY ON OUR LIMITED RESOURSES. 18-6

AS FAR AS POLICE PROTECTION, WE HAVE NONE OVER HERE AS IT IS. THERE ARE ONLY 3 OFFICERS FOR THE WHOLE VALLEY. BY THE TIME THE POLICE GOT THE CALL, IF THEY WEREN'T ALREADY ASSISTING IN BBL OR BBC, WHATEVER PROBLEM WAS OCCURING WOULD BE OVER WITH. WE ARE LAST ON THE LIST TO RECEIVE ASSISTANCE BECAUSE WE ARE FAR REMOVED DISTANCE WISE. 18-7

I LIVE ABOUT ½ MILE NORTH OF THE MOON CAMP AREA. RIGHT NOW IT IS VERY QUITE IN MY AREA. THERE ARE ONLY 2 FULL TIME RESIDENCES ON MY STREET. SINCE MOON CAMP IS DOWN THE HILL FROM ME, ALL THE NOISE WILL TRAVEL UP HILL AND MY QUITE WILL BE GONE. THERE WILL BE MORE DOGS BARKING AND PEOPLE NOISE. 18-8

TO SUM UP THE MOON CAMP DEVELOPMENT, IT WILL CAUSE UNDUE STREES ON EVERY ISSUE PRESENTED. UNFORTUNATELY

Peg Allen

Response to Commentor No. 18
Peg Allen
May 2004

18-1 It is the responsibility of the Project Applicant to prove that water resources are available to serve the project. Based upon the data available at the time of preparation of the EIR, the data suggested that there is not proof of water resources to support the proposed project. Thus, the EIR has concluded that impacts to groundwater resources are a significant adverse effect and until additional technical review is conducted to verify conditions, the project would result in an unavoidable impact. Although water conservation and/or drought–related measures to minimize water usage in Big Bear Valley have been implemented, if the Project Applicant provides future studies to indicate proof that water resources are available in the North Shore and/or Grout Creek Hydrologic Subunits and the Project Applicant has legal rights to the water, impacts to water resources could be determined to be less than significant. The project would be subject to all applicable water conservations measures per the direction of the water service provider (to be determined). Refer to Response to Comment Nos. 4-1, and 13-27 to 13-36 for impacts to fire protection services.

18-2 Commentor refers to safety hazards associated with the proposed highway realignment. Please refer to Response to Comment No. 13-65, which addresses this concern.

18-3 Commentor refers to impacts associated with tree removal and to the bald eagle. Please refer to Response to Comment No. 19-86, which addresses tree removal. Also, refer to Response to Comment Nos. 3-7, 13-88, 13-95 and 41-14, which address bald eagle concerns. The County will consider the Commentor's opinion during their deliberation on the project.

18-4 The County will consider the Commentor's opinion during their deliberation on the project.

18-5 Commentor refers to traffic impacts and affects to evacuation plans. Please refer to Response to Comment No. 13-32, which addresses this concern.

18-6 Commentor refers to current electric power shortages and the Project's impact to electric services. Please refer to Response to Comment No. 13-49, which addresses this concern.

18-7 Commentor refers to current police protection services and the Project's impact to police services. Please refer to Response to Comment Nos. 13-38 to 13-40, which address this concern.

18-8 Commentor refers to the proposed residential uses affecting current noise levels. Please refer to Response to Comment Nos. 13-80 to 13-85, which address this concern.

P.O. Box 409
Fawnskin, CA 92333
May 3, 2004

RECEIVED
MAY 0 _ 2004
E SERVICES DE
PLANNING D

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA 92415-0182

ATTENTION: Matthew W. Slowik, Senior Associate Planner
Advance Planning Division

RE: Draft Environmental Impact Statement for the Mooncamp Development, Tentative Tract Map # 16136

Dear Mr. Slowick:

We have reviewed the draft EIR for the Moon Camp development, tentative tract map #16136 and wish to provide public comments on it. Our area of expertise is air quality, atmospheric chemistry and air pollution. Between us, we have almost 90 years of experience in this area, and have written two books on the subject in addition to hundreds of scientific articles in peer-reviewed scientific journals. Attached are comments on the air quality section of the EIR. We believe that it is seriously deficient in a number of respects as detailed there.

As just one example, we attach copies of two photographs taken from Fawnskin overlooking Moon Camp on a typical winter morning; note the substantial reduction in visibility due to wood smoke trapped beneath the inversion layer. There is a state standard for visibility, yet this is not addressed in the EIR. More important are the effects of the particles that are responsible for the visibility reduction, and the associated pollutants, on human health, again not treated in the EIR. 19-1

Even in its present deficient state, the EIR finds that there are both short and long-term air quality impacts of the project that are "....considered significant and cannot be mitigated to a less than significant level" (See Executive Summary of EIR). When the issues we have raised (see attached) are taken into account, it is clear that the impacts will be even more severe. We urge the Planning Commission and the Board of Supervisors **not** to approve this development. 19-2

Yours truly,

Barbara J. Finlayson-Pitts

Barbara J. Finlayson-Pitts, Ph.D.

James N. Pitts, Jr.

James N. Pitts, Jr., Ph.D.

cc: Planning Commission: T. Kwappenberg, E. Laning, M. Cramer, M. Dowling, A. Matthews
Board of Supervisors: D. Hansberger, B. Posthumus, P. Biane, P. Aguiar, C. Young

Trapping of Pollutants Below the Inversion in Big Bear

View from Flicker Dr. around 9 a.m.

- Note top of inversion layer is very low; this concentrates pollutants, leading to larger human exposures

- Loss of visibility is due to particles; other pollutants also trapped but are invisible

View of Particles Trapped Under Inversion Layer

- Note inversion covers entire valley
- Emissions of air pollutants in one location are distributed throughout the valley and beyond

From North Shore Drive West of Fawnskin around 8 a.m. on a typical winter morning

COMMENTS ON AIR QUALITY PART (SECTION 5.6) OF EIR FOR MOON CAMP (Tentative Tract Map #16136)

Barbara J. Finlayson-Pitts and James N. Pitts Jr.

May 3, 2004

The air quality analysis section is inadequate in a number of areas:

1. It does not include either dispersion or photochemical modeling to predict the impact of the project on the concentrations of pollutants that will actually occur in the air in Big Bear Valley, nor the formation of toxic *secondary* pollutants *formed* by chemical reactions in air, e.g. ozone. The EIR simply uses an emissions model to calculate the number of pounds per day of *primary* pollutants that will be emitted *directly* by the project, and compares these to regional threshold values given in South Coast Air Management District (SCAMD) "look-up tables". The EIR does not treat what this means in terms of increases in actual air pollutant concentrations in the air that people breathe. For example, it states that "CO tends to be a localized pollutant, dispersing rapidly at the source" (pg. 5.6-16). This is not correct, particularly if there is an inversion which occurs more often than not in the mornings at the project site. This would be readily apparent if dispersion modeling were carried out. This is not an esoteric argument; in fact, the South Coast Air Management District (SCAMD) states that "project-specific modeling is recommended for projects larger than five acres", which applies to the proposed project (see www.aqmd.gov/hb/031034a.html). Furthermore, the SCAMD states that the "look-up tables" [are to be used] only for projects that are less than or equal to five acres... [and]... are applicable only to projects with emissions sources at a fixed location.... are not applicable to mobile sources traveling over local roadways". 19-3

Furthermore, the EIR completely omits treatment of even the emissions of three important air pollutants: SO_x, lead and toxic air contaminants (TACs). In the latter case for example, the threshold specified by the SCAMD is a maximum incremental cancer risk that is $\geq$ 10 in 1 million. The EIR does not identify the increased carcinogens that will be associated with the project and does not assess their impact against such a standard. 19-4

Similarly, while the EIR acknowledges the importance of secondary pollutants (e.g. ozone) which have major health impacts, it does not quantitatively treat their formation and associated concentrations in air that arise due to the reactions in air of the emissions of organics and oxides of nitrogen from the project. Again this requires project-specific modeling to take into account such factors as increased UV at the high elevations, which will lead to enhanced photochemical activity. 19-5

2. The EIR does not adequately address the impacts of the increased wood smoke emissions from fireplaces and wood stoves. These include both health (discussed in the next point) and visibility. On page 5.6-3 for example, the "haziness" is being described as being due to "moisture, suspended dust and a variety of chemical aerosols emitted by trucks, automobiles, furnaces and other sources". Wood smoke, the major source in Big Bear Valley for much of the year, is not mentioned. The climate is very dry so that 19-6

particle growth into the light-scattering range by water uptake is not a major factor in this area, and there are relatively few sources of airborne dust particles. 19-6

Table 5.6-1 does not include California's standard for visibility reducing particles, the current levels in Big Bear Valley and how the project would impact this. In addition, it does not address these same issues with respect to the California annual standard for PM_{10} (20 $\mu g\ m^{-3}$ annual arithmetic mean). While California does not have a 24 hour $PM_{2.5}$ standard at this time (the EIR incorrectly shows one), it does have an annual arithmetic mean of 12 $\mu g\ m^{-3}$ which is not specifically addressed with respect to the impacts of the project. 19-7

3. The serious impacts of the project on health are not adequately addressed in the EIR. This is of particular concern with respect to fine particles ($PM_{2.5}$) from diesels and from wood combustion. For example, Table 5.6-2 shows a number of effects of PM_{10} but does not address the more important issue of $PM_{2.5}$. Impacts summarized in Table 5.6-3 to 5.6-5 and the associated discussion of impacts do not address $PM_{2.5}$ at all. $PM_{2.5}$ should be included in all of the assessments of short-term and long-term impacts. Not only the numbers in terms of pounds per day of emissions, but the projected increases in the actual concentrations in air and the impacts on health and visibility should be included. 19-8

Furthermore, the EIR omits the most important effect which cannot be mitigated (at least for those impacted) and that is increased mortality. It is the increase in deaths due to particles that form the basis for the most recent particle standards [e.g. see Colburn and Johnson, *Science*, 299 665 (2003)]. In addition to increased mortality from all causes, there are a number of studies that show increased rates of lung cancer mortality [e.g., Pope et al, *J. Am. Med. Assoc.* 287 1132 (2002)]. This is particularly relevant for the proposed project because the increase in particles is projected to come from diesels during the construction phase and wood smoke after the homes are built. The EIR acknowledges the health effects of wood smoke on page 5.6-17: "The U.S. EPA estimates the cancer risk from wood smoke is twelve times greater than that from equal amounts of tobacco smoke". However, this is not translated into a quantitative assessment of the impacts of the proposed project. In addition, while increased emissions of toxic air contaminants associated with wood smoke and diesel exhaust are briefly acknowledged, these are again not treated in the EIR, despite a significant scientific literature on this subject. 19-9

5. Emissions of toxic air contaminants, TACs (California)/hazardous air pollutants, HAPs (federal) from all of the sources associated with the project, both mobile sources and stationary sources, are not treated adequately, despite existing standards for TACs/HAPs. 19-10

6. The EIR acknowledges the issue of "sensitive receptors" such as children at schools, patients in the hospital etc (page 5.6-11). However, the analysis of the impact of the project on such sensitive receptors is inadequate. For example, all eastbound traffic due to the project will unavoidably pass immediately adjacent to North Shore Elementary School at the intersection of North Shore Drive and Stanfield cutoff. The analysis in Table 5.6-6 is not at all clear. What would the increase in the concentration of CO be in air that the students actually breathe? Perhaps more important, what would the increase 19-11

be in PM_{10} and $PM_{2.5}$, particularly diesel particles which contain known carcinogens? What impact would changing the traffic assumptions have on these calculations? For example, the traffic analysis uses values for the lane capacity that represent ideal dry conditions; these are wildly optimistic for snowy or icy road conditions, or in the event of evacuations as occurred last fall during the fires. In addition, given the more rapid growth of the inland empire, the assumption of a constant rate of growth of traffic is dubious at best. 19-11

7. The use of "significant contribution to regional air pollution" (e.g. Table 5.6-3 to 5.6-5) is irrelevant to the impacts of the project on residents and visitors to Big Bear Valley. The project is located at high altitude in a valley that receives some air pollutants from transport from the much larger portion of the air basin at low elevations to the west. However, the local meteorology is such that the valley itself is a mini-air basin with frequent, low-level inversions over the valley itself, independent of what happens "down the hill". The comparison of projected emissions estimates in Table 5.6-7 to those of the entire basin is therefore irrelevant. Furthermore, as discussed above, SCAMD expects project-specific modeling for projects larger than 5 acres, not just total emissions estimates. In addition, the extrapolation to 2020 appears to be based on a linear extrapolation, which is not justified and is dubious at best. However, we note that even the comparisons to the SCAMD thresholds that the EIR did do shows they are exceeded for a number of pollutants both during construction and long term (Tables 5.6-4 and 5.6-5). 19-12

8. The mitigation measures cited include the use of EPA certified fireplaces and the use of a catalytic converter on the chimneys. However, there is no legal mandate to do so and hence assuming that this will happen is highly dubious. 19-13

9. Page 5.6-18 describes future hydrocarbon emissions standards for watercraft. However, it is not clear if these were included in the emissions estimates, or if they were, if it was assumed that all watercraft associated with the project would meet these new standards. This would be equivalent to assuming that the project residents would be continuously purchasing new boats as the standards changed, a highly unlikely scenario. Furthermore, there is no treatment of emissions other than hydrocarbons from watercraft, and the associated impacts on air quality. 19-14

10. The assumptions in the emissions calculations are not justified adequately. For example, a temperature range of 30 to 90^0 F appear to have been used; temperatures in the winter at the project site are frequently well below 30^0 F but rarely reach 90^0 F in the summer. 19-15

11. The description of the impact of temperature inversions on air pollutants (page 5.6-2) is not correct. While a low inversion height does prevent good vertical mixing and hence leads to higher concentrations at ground level, the mountain slopes actually provide a "chimney effect" in which the heated slopes cause the polluted air at the lower elevations to be sucked up along the mountain slopes to higher elevations. This leads to a significant impact of the South Coast air basin emissions on air quality in the mountains, and is why the data shown in Table 5.6-1 of the EIR shows that Crestline exceeds both 19-16

the state and federal air quality standards for ozone many days a year. The project impacts need to be viewed as being in addition to this effect. 19-16

12. Footnote 5 to Table 5.6-1 needs to be clarified. If particle standards are set for 24 hours, is the number of exceedances not based on the number of days in which the measured levels are above the standards, rather than the "number of samples exceeded"? If it were the latter and samples were taken once a week for example, then one could not obtain exceedances more than once a week, even if the levels were above the standard every day! 19-17

13. Footnote 2 to Table 5.6-5 is unclear. What does "25 % utilization of outdoor wood burning stoves" mean? 19-18

14. Page 5.6-3. The new 8 hour federal standard for ozone has been implemented. 19-19

Response to Commentor No. 19
Barbara J. Finlayson-Pitts, Ph.D. and James N. Pitts, Jr., Ph. D.
May 3, 2004

19-1 Visibility can be defined as the distance that atmospheric conditions permit a person to see at any given time. Technically, visibility is defined as the farthest distance an observer can distinguish a large black object against the horizon. Reduced visibility causes aesthetic impairment of surroundings and also interferes with aircraft operations. The State standard for Visibility Reducing Particulates is when the project "Reduces visual range to less than 10 miles at relative humidity less than 70 percent, 8-hour average (9:00 a.m. – 5:00 p.m.)." This criterion was stated within Table 5.6-2, *Air Pollution Sources, Effects and Standards.* The greatest contribution to visibility reduction in the Basin is from light scattering by "fine particle" aerosols with the size range of 0.1 to 2 microns (a micron is one-millionth of a meter). Additionally, refer to Response to Comment No. 19-7.

19-2 This comment does not raise a new environmental issue. Comment is noted and will be considered by the County of San Bernardino during their deliberation on the project.

19-3 The air quality analysis utilized the suggested methodology in the South Coast Air Quality Management District (SCAQMD) *CEQA Air Quality Handbook* (April 1993, as updated November 1993). Currently, the SCAQMD CEQA Air Quality Handbook Revision (Air Quality Analysis Guidance handbook) is still being developed by the SCAQMD. To estimate emissions from criteria pollutants, the analysis utilized the URBEMIS2002, EMFAC2002 and CALINE4 models, as recommended by the SCAQMD.[2] The results of the air quality computer modeling were then compared to the SCAQMD thresholds of significance, as contained within Chapter 6 of the *CEQA Air Quality Handbook*. The SCAQMD "look-up tables" were not utilized, as they are not recommended for Environmental Impact Reports, and are based on an outdated version of the Emissions Factor Model (EMFAC7G). The computer modeling utilized in the Moon Camp analysis was based on the latest iteration of the model (EMFAC2002).

By utilizing the SCAQMD methodology for computer modeling for primary criteria pollutants, secondary pollutants are innately addressed. The URBEMIS2002 computer model predicts concentrations of Sulfur Oxides (SO_x), Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Reactive Organic Gases (ROG) and Particulate Matter (PM_{10}). The URBEMIS2002 model is also designed to predict criteria pollutant concentrations for particular climates and terrain (for example the modeling for Moon Camp utilized the "Mountain Counties and Rural Counties" option). The thresholds of significance, as outlined in Chapter 6 of the *CEQA Air Quality Handbook* are designed to limit the amount of primary pollutants, as well as the formation of secondary pollutants (i.e., the formation of ozone resulting from the presence of sunlight and oxygen (O_2) reacting with nitrogen oxides (NO_X) and volatile organic compounds (VOCs)). Additionally, it should be noted that most Ozone destruction takes place through catalytic processes rather than Chapman Reactions

[2] http://www.aqmd.gov/ceqa/models.html

(Ozone is a highly unstable molecule that readily donates its extra oxygen molecule to free radical species such as nitrogen, hydrogen, bromine, and chlorine). These compounds naturally occur in the stratosphere, released from sources such as soil, water vapor, and the oceans. Meanwhile, the destruction of ozone by the free radicals goes on continuously. That is why O_3 concentrations will be higher during the day and lower at night.

It should also be noted that localized dispersion modeling was conducted for Carbon Monoxide with the SCAQMD approved CALINE4 model. CALINE4 is the standard modeling program used by the California Department of Transportation (Caltrans) to assess Carbon Monoxide impacts near transportation facilities. It is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway. The other SCAQMD approved dispersion model, Industrial Source Complex Dispersion Model (ISCST3), provides options to model emissions from sources that might be present at a typical industrial source complexes. The basis of the model is the straight-line, steady-state Gaussian plume equation, which is used with some modifications to model simple point source emissions from stacks, emissions from stacks that experience the effects of aerodynamic downwash due to nearby buildings, isolated vents, multiple vents, storage piles, conveyor belts and the like. This type of use is not anticipated at the Moon Camp project site, thus it was not utilized in the analysis. Photochemical modeling, such as the Variable Grid Urban Airshed Model program, was not utilized in the analysis as the SCAQMD does not require this type of modeling for residential and recreational land uses.

19-4 Sulfur Oxide (SO_x) emissions were quantified in the URBEMIS2002 modeling. The results were not included in the text as the South Coast Air Basin has been in attainment for SO_x for many years. Additionally, SO_x levels have not exceeded the National or State Ambient Air Quality Standards (AAQS) at any of the SCAQMD monitoring stations in the past five years. SO_x levels arising for project related emissions would only be 0.11 pounds/day in the summer and 1.88 pounds/day in the winter, well below the SCAQMD threshold of 150 pounds/day.

Lead is not expected to be a pollutant of concern at the project site. The project does not propose any land uses that would typically utilize large amounts of lead (i.e., manufacturing or industrial facilities). The primary source of lead in the project area would be from vehicles. However, most vehicles in current operation utilize oxygenated unleaded gasoline, which has lead to the steady decrease of lead in the in the South Coast Air Basin. Thus the project is not expected to exceed the state threshold of 1.5 $\mu g/m^3$ per 30-day average.

As noted above, the project does not propose any uses that would release acute amounts of Toxic Air Contaminants (i.e. manufacturing or industrial facilities). California regulates toxic air contaminants through its air toxics program, mandated in Chapter 3.5 (Toxic Air Contaminants) of the Health and Safety Code (H&SC Section 39660 et. seq.) and Part 6 (Air Toxics "Hot Spots" Information and Assessment). However, as the project proposes 92 residential units and a marina slip configuration for recreational boater activity, Toxic Air Contaminants are not expected to be a significant source of pollution from project operations. Health Risk Assessments (HRA) for Diesel Particulate Matter (DPM) are typically conducted for

areas that would expose sensitive receptors to high concentrations of DPM over a long period of time. Per a telephone conversation with Steve Smith, the Program Supervisor of the CEQA Section at the SCAQMD (June 30, 2004), estimating cancer risk for DPM is not required for construction activities because construction activities would only occur for a short period of time and therefore would not measurably increase cancer risk. Estimating individual cancer risk from DPM would only be necessary if activities that result in the release of DPM would last for seven or more years. The proposed project would not require a Health Risk Assessment for DPM because it would not expose sensitive receptors to excessive DPM for a long period of time.

19-5 Commentor refers to secondary pollutants and affects to air quality. Please refer to Response to Comment No. 19-3, which addresses this concern.

19-6 Impact Statement 5.6-2, *Long-Term Operational Impacts*, discusses and quantifies emissions that are anticipated to result from the residential wood burning fireplaces at the project site. The URBEMIS2002 model conservatively estimated eight hours of wood burning use during the winter months for all 92 residential units using a fireplace and 23 units using an outdoor wood-burning stove. The assumptions are conservative and are considered worst case.

19-7 Table 5.6-2, *Air Pollution Sources, Effects and Standards*, identifies the state standard for visibility reducing particulates. The standard was not included in Table 5.6-1, *Local Air Quality Levels*, as neither the SCAQMD nor the California Air Resources Board (CARB) currently monitors visibility.[3] Page 5.6-7 specifically identifies the annual average standard of $PM_{2.5}$ as 12 $\mu g/m^3$. Additionally, refer to Response to Comment Nos. 15-2 and 19-8.

19-8 Currently, the SCAQMD does not have guidance on modeling techniques or thresholds of significance for fine particulate matter ($PM_{2.5}$).[4] The SCAQMD is in the process of developing a proposal that would outline specific thresholds of significance and recommended modeling techniques for fine particulate matter. Currently, the SCAQMD recommends modeling coarse particulate matter (PM_{10}), and assessing it against the thresholds of 150 pounds/day for the construction period and operations period. Additionally, per the SCAQMD, the current methodology is to assess $PM_{2.5}$ qualitatively until further guidance is issued.

19-9 The Commentor's general comments are noted and will be considered by the County of San Bernardino. The statements used in the Draft EIR for gauging the significance of air quality are based on widely accepted methodology, County Standards and the South Coast Air Quality Management District Rules and Regulations. These standards are considered appropriate, and even conservative. Additionally, please refer to Response to Comment Nos. 19-4, 19-6 and 19-13.

19-10 Commentor refers to air quality impacts associated with toxic air contaminates. Please refer to Response to Comment No. 19-4, which addresses this concern.

[3] http://www.arb.ca.gov/qaweb/sitelist_create.php

[4] Conversation with Steve Smith, SCAQMD on July 14, 2004.

19-11 The air quality analysis utilized the SCAQMD guidelines for assessing localized Carbon Monoxide hotspots, as well as the guidance contained in the *Transportation Project-Level Carbon Monoxide Protocol* from the University of California Davis Institute of Transportation Studies. Per these guidelines, the effects from project related carbon monoxide were found to be less than significant. For coarse particulate matter (PM_{10}), the analysis utilized the SCAQMD recommended modeling techniques and threshold of 150 pounds/day. Additionally, refer to Response to Comment No. 19-8.

19-12 The thresholds of significance reflected in Table 5.6-3, *SCAQMD Thresholds of Significant Contribution to Regional Air Pollution*, are recommended by the SCAQMD for analyzing a project's air quality impact in the South Coast Air Basin. The SCAQMD does not issue guidance for "microbasins" or issue project specific thresholds. The operational and cumulative impacts were assessed per the current SCAQMD *CEQA Guidelines* (November 1993) and the *Final Air Quality Management Plan* (August 2003). Additionally, refer to Response to Comment No. 19-3.

19-13 The EPA certified fireplaces were recommended as mitigation measures and are thus incorporated into the Mitigation Monitoring and Reporting Program. The developer is required to adhere to the MMRP and compliance is ensured through the County plan check and design review process. Additionally, refer to Response to Comment No. 13-4.

19-14 The operational air quality analysis qualitatively addresses the emissions from boating activity. As the emissions from operational sources are significant and unavoidable, the quantification of emissions from boats is not necessarily required and does not alter the conclusion. Boat engines are divided into classes of outboards or inboards. Outboard engines are mounted external to the boat structure. They typically hang on the rear wall of the boat. To minimize their weight, outboard engines have traditionally been two-stroke engines, thus personal watercraft (PWC), which are most commonly two-stroke jet-drives, are grouped together with them.

In 1998, the CARB approved emission reductions from outboard engines and personal watercraft by adopting exhaust emission standards for new engines. Starting in 2001, all new outboards sold in California were required to meet the EPA 2006 emission levels (approximately 75 percent reduction from uncontrolled levels).

The new California regulation requires that new outboard and PWC engines meet the EPA 2006 standards for hydrocarbon (HC) plus oxides of nitrogen (NOx) in 2001. This level represents about a 70 percent reduction in HC emissions from the pre-1998 levels. In addition, the California regulation adds a very-low-emission tier for 2004 of about 77 percent reduction from pre-1998 levels, and an ultra-low-emission level for 2008 and later of about 90 percent reduction.

In an effort to quantify the emission from personal watercraft associated with the project, the SCAQMD provided emissions factors for two stroke engines. Utilizing the SCAQMD emission factors, as well as assuming a usage factor of 9 percent per the Big Bear Municipal Water District Management Plan (2000), the emissions were calculated on a daily basis. As the project includes a 100-slip small craft harbor, the

9 percent usage rate translates into 9 boats operating simultaneously. To calculate the emissions from these boats, the following assumptions are utilized:

Emissions Factor for 2-Stroke Engines (g/kW-hr)[5]

Engine Size (hp)	HC	NO_x	CO	PM_{10}
150-300	366	2.2	672	0.0053

Total Daily Emissions (lbs/day)

Engine Load factor = 40 percent
Percent Usage = 9
Hours/Day Operation = 4

Length(ft)	HP/Slip	Boats	HC	NO_x	CO	PM_{10}
<20	150	6	0.01	1.94	0.07	0.80
<30	300	3	0.01	1.94	0.06	0.80
Total (lbs/day)		**9**	**0.02**	**3.88**	**0.13**	**1.6**

As evidenced above, although the emissions would not exceed the thresholds developed by the SCAQMD, the operational emissions would still remain significant and unavoidable. Although the above calculations are representative of average weekend usage, the significance conclusion would remain the same during peak summer and holiday usage periods.

19-15 Temperature data is used in the URBEMIS2002 to estimate winter and summer pollutant concentrations. The value that is put into the model is the ambient temperature. Although, it is acknowledged that temperatures at the project site are frequently below 30°F, the model utilizes the ambient temperature instead of the lowest recorded temperature. Additionally, 90°F was utilized for the same purpose, as well as to present a conservative scenario.

19-16 Comment is noted. Commentor refers temperature inversions and affects to air quality. Please refer to Response to Comment No. 19-3, which addresses this concern.

19-17 Measurements are usually collected every six days. Measured days counts the days that a measurement was greater than the level of the standard, while estimated days mathematically estimates how many days concentrations would have been greater than the level of the standard had each day been monitored. State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

19-18 Footnote 2, in Table 5.6-5, *Long Term Project Emissions,* means that that computer model default was changed to predict the pollutants arising from 25 percent of the

[5] Per Gordon Mize, South Coast Air Quality Management District Transportation Specialist, July 20, 2004.

homes (23 homes) using an outdoor wood stove and 100 percent of the homes (93 homes) would use an indoor wood burning fireplace. This scenario is highly conservative and was designed to be a worst-case scenario. Additionally, refer to Response to Comment No. 19-6.

19-19 Comment noted, on April 15, 2004 the Environmental Protection Agency formally replaced the 1979 1-hour ozone standard with a more stringent 8-hour standard as part of the Clean Air Rules of 2004.

RECEIVED
MAY 2004

May 5, 2004

945 Deertrail Ln. Fawnskin

MATTHEW W. SLOWIK
County of San Bernardino,
Land Use Services Department,
Planning Division,
385 N. Arrowhead Ave.,
San Bernardino, CA 92415-0182

Dear MATTHEW,

RE: ". DRAFT EIR FOR MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGHMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP # 16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK."

Thank you for the opportunity to review this document. As usual in a document such as this one the developer has played down most of the key issues by concluding, **"THAT THE IMPACTS ARE LESS THAN SIGNIFICANT."** For example

1. ZONING CHANGE SEC. 5.1-2 Statements 1 though 4 the proposed project is **NOT** a community benefit and **DOES** have an adverse effect on the surrounding property. So those statements are not true and a change from rural to residential is not a logical extension. **20-1**

2. CUMULATIVE IMPACT SEC. 5.13 this proposed project combined with the proposed Marina Point development, the Brookside project, plus expansion of the Discovery Center will have **extremely significant combined impact.** **20-2**

3. FIRE PROTECTION SEC. 5.3-1 New evaluations needed since **FIRE RISK** level upgraded from **FIRE RISK LEVEL 2 TO LEVEL 1** everything is invalid. **20-3**

4. WATER SEC.5.3-9 Current drought condition with no end in sight, and increase in rates and water restriction already in place. DWP declared a **WATER SHORTAGE EMERGENCY RESOLUTION ON April 27th, 2004.** Conservation Stage II now in effect with strong possibility that Stage III and IV could be in effect by the end of the summer. The water supply **MUST** be proven prior to changing the zoning. The ground water basin **is already in overdraft conditions.** **20-4**

These are only a few of the so-called conditions **"That the impacts are less than significant".** Others of importance and will have significant impact on the community are, Wastewater, Solid Waste, Electricity, Traffic, Noise, Tree Removal, Eagle Habitat, Sewer Capacity, Noise, Police Protection, and many others that are listed in the DEIR

All these environmental hazards associated with a development of this magnitude should be reviewed very carefully. **Hasty decisions on a complex issue such as the one before you should not be made.**

Yours Sincerely,

Herbert V. Clotts

Herbert V Clotts

Response to Commentor No. 20
Herbert V. Clotts
May 5, 2004

20-1 Commentor refers to the Project's consistency with the General Plan. Please refer to Response to Comment Nos. 13-9 to 13-16, which address this concern.

20-2 Commentor refers to cumulative impacts associated with other foreseeable projects. Please refer to Response to Comment No. 13-2, which addresses this concern.

20-3 Commentor refers to the accuracy of the current Fire Risk Level designation in the project vicinity. Please refer to Response to Comment No. 13-27, which addresses this concern.

20-4 Commentor refers to water supply and affects to groundwater. Please refer to Response to Comment Nos. 1-4, 1-5 and 18-1, which address this concern.

DRAFT

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RECEIVED
MAY 2004

Wednesday, May 5, 2004

Matthew W. Slowik
Land Use Services Department
Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RE: **DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.,GENERAL PLAN AMENNDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/rl-40 TO BVRS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE;TENTATIVE TRACT MAP #1636, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.**

Dear Mr. Slowik:

Thank you for the opportunity to review the document and provide comments. I oppose this Moon Camp project as presently designed, because the DEIR fails to adequately evaluate the true impact on the Fawnskin area. The following are examples of my concerns:

Section 5.4 – Aesthetics - "Scenic Highway"
State Route 38 that runs though the proposed project is designated as a County Scenic highway and an "Eligible State Scenic Highway. The North Shore Improvement Association is providing input to the new county general plan. As part of this activity I have agreed to work on a proposal to obtain state designation for the county scenic highway.

At a county general plan meeting in Big Bear City on February 17, 2004. I asked that the county support state designation for the scenic highway. Terri Rahhal, the San Bernardino County Planning Representative, stated that the Route 38 was a county scenic highway, and she agreed to work with me on state designation. In a phone conversation after the meeting I told Terri that my contact on Scenic Highways at the State was Dennis Cad at Caltrans. Terri called Mr. Cad and reviewed what was needed to move forward. She called me back and stated that a letter of commitment from the county was the next step. In late March Terri informed me that she submitted the request to her supervisor. In May Terri stated that cannot send a letter of support until the general plan is completed.

21-1

Section 5.4 –Aesthetics – Cont.

I believe that this decision came from the San Bernardino Board of Supervisors not the planning department. I also believe that this project will change the scenic views to the point that highway 38 will not meet the standards for either a county or state designation as a scenic highway. This project will add houses on the water, eliminate many of the curves in the road, and block the views of the lake and the forset. This could be the reason that the county has not responded to the request for state designation for the county scenic highway. 21-1

Because of the above, this project as presented in the draft EIR will have a very detrimental impact on the aesthetics (Section 5.4) of the area.

Police Protection – Section 5.3-2

As President of North Shore Improvement Association, I have received a number of complaints regarding the response time from the Sheriff's Department. In every case the response time was two to three hours. This draft EIR does not take into account the negative impact of the Marina Point Development. This project will make a bad situation much worse. 21-2

Because of the above this draft EIR will provide a significant negative impact on police protection.

Water – Section 5.3-6

First SB221 does apply as 92 additional connections is a 14% increase. The next problem is the fact that the impact of the Marina Point Development on the ground water is not discussed in the draft EIR. 21-3

Two more issues are changes that have occurred in the last few months. New private wells have been drilled in the area including one within 20 feet of the West end of the Moon Camp property. Second, The Department of Water and Power under Water Code Section 351 has expanded the drought conservation regulation to stage II effective May 1, 2004. This includes a 30% reduction in outdoor water use and drop in water connections valley wide to from 200 to 180. The DWP notice also includes the following, "If the targeted 10%(indoor) reduction is not achieved by mid-summer, adoption of more restrictive water-use regulations may be considered. If the drought continues, will the hook ups be lowered to 50 valley wide? Will the Marina Point Development use up all the available hookups? 21-4

Because of the extreme drought situation, the approval of 92 water hook ups when they may not be available is not just a major negative impact it is unconscionable. 21-5

Thank you for the chance to respond to the Draft EIR.

Sincerely,

Robert R. Henrich

cc: Supervisor Dennis Hansberger
Congressman Jerry Lewis
Senator Jim Brulte
Assemblyman Russ Bogh
Senator Nell Soto

Response to Commentor No. 21
Robert R. Henrich
May 5, 2004

21-1 The County will consider the Commentor's opinion and comments during their deliberation on the project.

21-2 Commentor refers to current police protection services and the Project's impact to police services. Please refer to Response to Comment Nos. 13-38 to 13-40, which address this concern.

21-3 Refer to Response to Comment No. 13-42 for a discussion of the applicability of SB221. The discussion of groundwater resources in Section 5.11, *Hydrology and Drainage*, concludes that impacts to groundwater resources are a significant adverse effect and until additional technical review is conducted to verify conditions, the project would result in an unavoidable impact. This conclusion was based upon the 2003 GSS report that analyzed both the North Shore and Grout Creek Hydrological Subunits. It will be the responsibility of the Project Applicant to prove that water resources are available to serve the Moon Camp project. Similarly, it is the responsibility of the Project Applicant of the Marina Point Development to prove that water resources are available to serve that project. The Cumulative Impact analysis in Section 5.3, *Public Services and Utilities*, concludes that cumulative impacts are significant and unavoidable regarding water service since no water service provider has been identified.

21-4 Commentor refers to water supply and cumulative affects to groundwater. Please refer to Response to Comment Nos. 13-48, 18-1 and 21-3, which address this concern.

21-5 The County will consider the Commentor's opinion and comments during their deliberation on the project.

P O Box 368
Fawnskin CA 92333
May 7, 2004

2004

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino CA 92415-0182
Attn: MATTHEW W. SLOWIK

RE: Draft EIR for the Moon Camp Development Project/RCK Properties Inc.:
General Plan Amendment/Official Land Use District Change from BV/RL-40 to BV/RS-7200,
and Amendment to County Circulation Element for Realignment of North Shore Drive:
Tentative Tract Map #16136, and Conditional Use Permit for a Boat Dock

Dear Mr. Slowik:

Thank you for the opportunity to review the DEIR for the above proposed projects. We oppose this Moon Camp project as presently designed because the DEIR fails to adequately evaluate the true impact this proposed project would cause in the critical issues of zoning change, water supply, and fire protection. 22-1

First, zone change (Section 5.1.2). The proposed project could not be a community benefit with 92 houses obstructing spectacular views of the forest and lake from existing houses as well as from the highway (Currently the **only** highway views of the lake and mountains in the entire valley are at the site of the proposed project) (Moving the highway would not only destroy views but would lead to increased traffic and speeding.) The proposed project would entail removal of more than 25% of the trees (including some eagle perches.) More than half of the proposed houses would abut the National Forest and Big Bear Lake, and we do not believe the change from rural to residential could be considered an extension of the purpose of the National Forest or of the Lake. 22-2

Secondly, the issue of water shortage (Section 5.3.6d). Section 5.3.6a of the DEIR states that the water supply must be proven prior to building permits, and that clearly has not been done for the proposed project as a whole, much less for individual lots. Further, the DEIR states that the water issue cannot be mitigated to below significance. The DEIR evaluates water production of the two wells on the property of the proposed project **when they were dug in 1987** and not on the extensive drought conditions that exist today. Mitigation on 5.3.6d presupposes current water restrictions, even though they are not presently enforced on the existing houses in the valley, much less in a proposed new development. 22-3

Lastly, fire protection (Section 5.3.1e-f). All of the evaluations of this Section were based on Fire Risk level 2, but the entire mountain area has been upgraded to Fire Risk level 1, rendering all the findings of the DEIR invalid! The Steering Committee evaluating status of fire protection in Big Bear Valley has determined that Fawnskin fails to meet any of the National Fire 22-4

Protection Association standards now, and additional houses will only compound the problem. (See enclosed.) Section 5.3.1 says fire sprinklers would be added in lieu of additional manpower. Fire sprinklers often burst in winter and thus malfunction, leading to additional waste of water. In Section 5.3.1..e-f, fire resistant vegetation would be planted by homeowners. Who would monitor this to make sure they are enforcing the rules? How about evacuations from the valley? Unmentioned in the DEIR is the impact of more evacuees. (The roads were highly congested when we evacuated in October 2003.) 22-4

Thank you for your consideration of our opposition to this proposed Mooncamp project.

Very truly yours,

Donald L. Eads, MD

A. Claudia Eads, MD

Organizational Structure/Service Levels Task Group

Mission Elements and Service Levels

KEY:	High	Medium	Low	None

	Fire Prevention	Emergency Response	Training	Administration	Disaster Preparedness
	Fire Prev. Insps.	Fire Suppression	In-House Programs	Records Mgmt.	Operations Ctr
BBL	Medium	Medium	Medium	Medium	Low
BBC	Low	Medium	Medium	Medium	Low
County	Medium	None	Medium	High	~~High~~ Low
Merged Dept					
	Public Education	Emergency Medical	Specialized Outside	Payroll	Neighborhood Prepared.
BBL	Medium	High	Medium	High	Medium
BBC	Medium	High	High	High	Medium
County	Medium	High	High	High	~~High~~ Med
Merged Dept					
	Development Review	Hazardous Materials	Command/Leadership	Purchasing	Business Prepared.
BBL	High	Low	Medium	High	None
BBC	High	Low	High	High	None
County	High	High	High	Medium	~~High~~ None
Merged Dept					
	Plan Checking	PCF Firefighters	Tactics & Strategy	Equip. Maintenance	Disaster Eqpt/Supplies
BBL	High	Low	Medium	High	Low
BBC	High	Medium	Medium	High	Low
County	High	LT-High/PCF-Medium	High	High	~~Medium~~ Low
Merged Dept					

FIRE DEPARTMENT SERVICE-LEVEL ANALYSIS

Determining the correct level of fire department services is a very difficult task according to the National Fire Protection Association (NFPA) Fire Protection Handbook. The seventeenth edition of the NFPA Handbook, pages 10-43, "Fire Department Services levels" states, "Public, fire, and other government administrators, organized labor, and the fire service in general have for many years sought to find a generally accepted method for the evaluation of services provided to a community by its fire protection agency. The approaches have been as varied as the fire service agencies being evaluated and the parties doing the evaluation. This has resulted in the application of inconsistent methodology and criteria.

For many years, material developed by NFPA has been used in the analysis of services provided by fire protection organizations. However, the application of NFPA material has been inconsistent, and NFPA material existing in 1991 is not entirely adequate for the evaluation of the comprehensive services provided by comprehensive fire/rescue agencies."

In 1991, an NFPA committee determined that the best program for the analysis of services would:

- Consider the total scope of services provided by the fire service agency.
- Set forth uniform definitions.
- Be primarily performance-based and user-friendly.
- Be founded on consensus and other standards to the greatest possible extent.
- Include user input.
- Be designed for specific community application.
- Be capable of self-application
- Include a validation process.

Based on these recommendations, we are going to develop a uniform set of definitions that are based on recognized city, county, state, and national standards. Each definition will be followed by a level of service ranging from None to High. We will bring back to you a chart showing the current level of service provided by each department based on the service level definitions in this document.

EMERGENCY RESPONSE

The goals and Objectives of fire control response is to provide a fire control system capable of controlling unfriendly fires before they reach the flashover stage within a structure or of a size that cannot be controlled with mutual aid resources outside of a structure.

The Goals and Objectives of medical aid is to provide a medical aid system capable of providing advanced life support and emergency transportation to all areas of the community at the paramedic level.

The Goals and Objective of Hazardous Material Response is to provide First Responder Personnel on the scene of an hazardous materials spill to secure the scene or to mitigate the emergency depending on the material(s) involved.

2.1 FIRE SUPPRESSION:

NFPA recommends the following response levels to structure fires; High hazard occupancies - 6 apparatus and 26 firefighters, Medium hazard occupancies - 4 apparatus and 17 firefighters, Low hazard occupancies 3 apparatus and 13 firefighters, Rural operations - 2 apparatus and 13 firefighters.

High level of service meets all of the NFPA requirements for High hazard occupancies.

Medium level of service meets the NFPA requirements for Medium hazard occupancies.

Low level of service meets the NFPA requirements for Low hazard occupancies.

None fails to meet any of the NFPA standards.

Response to Commentor No. 22
Donald L. Eads, M.D.
May 7, 2004

22-1 The County will consider the Commentor's opinion and comments during their deliberation on the project.

22-2 Commentor refers to the Project's consistency with the County General Plan. Please refer to Response to Comment Nos. 13-9, 13-10, 13-12 and 13-16, which addresses this concern. Also, refer to Response to Comment Nos. 3-7, 13-88, 13-95 and 41-14, which address bald eagle concerns. The County will consider the Commentor's opinion during their deliberation on the project.

22-3 Commentor refers to current water restrictions and affects to water supply. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5, 4-2 and 13-47, which addresses these concerns.

22-4 Commentor refers to fire hazards and affects to fire protection services. Please refer to Response to Comment Nos. 4-1, 4-4, and 13-27 to 13-36, which address these concerns.

County of San Bernardino, Land Use Dept./Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RECEIVED
MAY 2004
LAND
ADVA

Attn. Matthew W. Slowik

DRAFT EIR FOR MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE: TENATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

I have had the opportunity to review the draft EIR and I oppose the Moon Camp project as presently designed because the DEIR fails to adequately evaluate the true impact to our community of Fawnskin. The critical issues I address are:

Aesthetics and Land Use

The EIR does not consider the cumulative impact of traffic which will exist onto Highway 38 within a 1/2 mile from the 92 Moon Camp residential sites, the l34 sites at adjacent Marina Point and the existing traffic off Canyon. Not included in the EIR is the additional traffic of cars and trailers for the100 dock marina at Moon Camp and the adjacent docks at Marina Point. 23-1

Cal Trans was not among the agencies consulted in this EIR yet the development as designed requires a rerouting of Highway 38. The road as proposed will not eliminate the traffic flow problem but allow the development of additional lake front parcels. Rerouting of Highway 38 will create a visual impact on this lakefront stretch of county scenic highway. 23-2

Before and after pictures from north, south, east and west are inadequate to neither show the development at build- out. Pictures do not depict the type of structures currently being built in the mountains nor show the loss of mature trees on the site. The visual impact cannot be mitigated. 23-3

The EIR fails to consider the cumulative visual impact of a100 dock boat marina adjoining Marina Points' marine. Parking spaces for the cars at the marinas does not take into consideration maximum weekend and holiday usage. Number of parking spaces needed should reflect county code for other marinas along the north shore. 23-4

EIR does not address off site storage locations for the 100 boats and trailers during approximately 7 months of the year. 23-5

EIR does not address the low lake level for the past several years and what the added boat capacity would do for safety and navigation 23-6

EIR does not adequately address public access to neither the lakeshore nor the loss of shoreline since 1999. Picnicking, fishing and hiking have been reduced due to residential structures and loss of public access. 23-7

Public Services:

EIR is premature and does not adequately address the cumulative impact of the water supply or lack there of for 95 additional residents with the 134 at Marina Point. On site wells have not proven to provide the water needed for build-out 23-8

EIR does not address the current water conservation measure in effect and how the project will add to the water problem as it now exists in the Big Bear Valley. 23-9

One-time developer fees assessed at construction would not mitigate the impact of new students at North Shore School. Consider 100 residences at Moon Camp and 134 at adjacent Marina Point. EIR 5.3-2 says the BVUSD schools are at maximum capacity and so do not have adequate school housing and replacement facilities are needed. With .02 students per household and the adjacent sites of Moon Camp and Marina Point with a combined capacity of 229 residences there would be approximately 45 new students generated. This impact to the already overcrowded conditions in our school is not mitigated. 23-10

The EIR doe not admit to consulting the following agencies for input. Was an EIR document circulated to them?

United States Forest Service (the development is adjacent to the USFS on the north and.east and needs to address eagle and biological concern.)

Department of Fish and Game (input necessary for shoreline Fish habitat.) 23-11

Cal Dept of Forestry and Fire Protection (harvesting and tree removal in Eagle habit.)

Army Corp of Engineers (input necessary for dredging to Deepen a site for boat docks.

Cal Trans (necessary to give input to the rerouting of our

Scenic highway. 23-11

The proposed land use District change will have a substantial adverse effect on the surrounding property and the community of Fawnskin. I propose that the zoning remain as is and consider those who purchased in the area based on the current zoning. 23-12

Thank you for the opportunity to comment on this Moon Camp DEIR.

Sincerely,

Mary Lee Drake

Mary Lu Drake
39722 Flicker Road/ PO Box 164
Fawnskin, CA. 92333

Response to Commentor No. 23
Mary Lu Drake
May 10, 2004

23-1 Commentor refers to cumulative traffic impacts associated with the Marina Point Development. Please refer to Response to Comment No. 13-2, which addresses this concern.

23-2 Section 5.4, *Aesthetics/Light and Glare*, analyses long-term scenic highway (State Route 38) impacts associated with the proposed project. As stated under Impact Statement 5.4-3, the analysis has concluded that significant and unavoidable impacts would occur in this regard as a result of project development. Also, refer to Response to Comment No. 13-5.

23-3 Commentor refers to the visual simulations not being reflective of build-out of the project area. Please refer to Response to Comment Nos. 13-54 and 13-55, which address this concern.

23-4 Cumulative visual impacts associated with the Marina Point development and the proposed marina facility are addressed in Response to Comment No. 13-56. Additionally, the project design must meet all County of San Bernardino parking code requirements or there must be a Parking variance granted by the County.

23-5 Commentor refers to off-site storage locations of boats and trailers and affects to the existing aesthetic character. Please refer to Response to Comment No. 13-57, which addresses this concern.

23-6 The Commentor refers to the low lake levels for the past several years and potential safety and navigation impacts associated with the added boat capacity. As stated in Section 5.2, *Recreation*, according to the Big Bear Municipal Water District Management Plan, the carrying capacity of the lake is 1,000 boats. Based upon boat use factors, project implementation would not exceed the boat carrying capacity of the lake. Thus, navigation of the lake would not be compromised by implementation of the proposed project. Boating safety would be ensured through individual boat users complying with boating regulations and procedures established by the Big Bear Municipal Water District. Also, refer to Response to Comment No. 13-35.

23-7 Commentor refers to decreased public access to the lakeshore. Please refer to Response to Comment No. 13-26, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

23-8 Commentor refers to water supply and cumulative affects to groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5 and 21-3, which address this concern.

23-9 Commentor refers to existing water conservation measures and affects to water supply. Please refer to Response to Comment No. 18-1, which addresses this concern.

23-10 As stated under Impact Statement 5.3-3, based on correspondence with the Bear Valley Unified School District (BVUSD), the District anticipates that the Project may result in the need for additional facilities and may require modifications to schools of attendance. Although schools serving the Project are over capacity and replacement facilities are needed, the District has stated that it could serve the projected number of students that would be generated from the proposed Project following payment of school impact fees and compliance with all applicable requirements, codes, and ordinances. Currently, the District collects Developer's Fees for new construction. The current residential rate is $0.82 per square foot. The Developer's fees are determined by a Developer Justification Study commissioned by the District every two years. BVUSD is currently in year four of a modest enrollment decline. Currently, the District seeks modest enrollment growth and the proposed Project would contribute to modest enrollment growth. Thus, payment of Developer Fees in accordance with the latest Developer Justification Study would reduce impacts to less than significant levels. Additionally, it is noted that CEQA does not require any additional action above and beyond payment of this fee.

23-11 Commentor refers to lack of agency consultation with various governmental agencies. Please refer to Response to Comment No. 13-5, which addresses this concern.

23-12 The County will consider the Commentor's opinion and comments during their deliberation on the project.

RECEIVED
MAY 17 2004
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

May 10th, 2004

County of San Bernardino
Land Use Services Department
Planning Division
385 N. Arrowhead Ave. First Flr.
San Bernardino, CA 92415-0182
Attn: Matthew W. Slowik

RE: Draft EIR for the Moon Camp Development Project/RCK Properties Inc: General Plan Amendment/Official Land use district change from BV/RL-40 to BV/RS-7200 and amendment to county circulation element for realignment of North Shore Dr; Tentative tract map #16136, and conditional use permit for a boat dock.

Thank you for the opportunity to review this document.

As a layperson, reading and trying to wind your way through complicated and wordy material can be daunting. Trying to figure out what certain terms actually mean can be frustrating. But I feel my points are valid and well thought through.

After reading the information on the proposed projects I must state my opposition to the venture. The DEIR fails to adequately evaluate the true impact this project will cause the community in general and there will be very specific detrimental effects as well. 24-1

As a resident of Fawnskin for the last three years, I can state that I am *not* opposed to growth in this area, but the growth must be in line with the current values and environment that is already established. Timing is also crucial. The proposed project does not conform and is poorly timed.

Fire is the main problem facing all of the mountain properties and will be for the next decade. In section 5.3-1 all the evaluations were based on Fire Risk level 2, unfortunately for us all we are now at Level 1, which negates all of the findings. Also in regard to fire, the impact of a development of this size would greatly increase the amount of time to evacuate in case of a scenario like last October's. This is not addressed at all in the DEIR. It is significant and tremendously important to those of us who already live here. Last October was a frightening and dangerous situation. Let's not make the next time worse. 24-2

Water is already in short supply for the valley. This also will not get any better in the foreseeable future. No one is predicting an El Nino season anytime soon. 24-3

The DEIR in section 5.3-6 states that the project is exempt from SB221, but from all that I have read this is not true and should conform. It tremendously understates the crisis situation we are in and should be re-evaluated. No one can predict when the shortage will be reversed; we shouldn't overburden the system with ill proposed developments. 24-3

I purchased my home in Fawnskin for the beauty of the area and the proximity of the lake to my property. The expanding views and vistas of the lake greatly increase the value of the area. Everyone in Fawnskin currently shares the beauty of the scenery. The proposed project will greatly impact the rest of the residents in the area. It will change the topography significantly. The County designates state road 38 as a Scenic Highway. The DEIR already concludes that the impact to the aesthetics would be significant and unavoidable. The drawn views do not accurately show the impact on the area. They are not even drawn to scale. It must be revised to accurately show the damage to other resident's enjoyment of the area. 24-4

You must remember that Fawnskin is home to Bald Eagles and their rights must be protected. The growth in the area has been small and measured to keep the eagles safe and undisturbed. The proposed project does not take into consideration the destruction caused by construction and the noise and pollution that will be brought to Fawnskin. (section 5.8) The Eagle has been in danger because of man's misuse of land and chemicals. Do we think that this will be any less toxic to the creatures who call the area home? 24-5

Unfortunately I don't have the time to address every point that I found wanting or disturbing in the DEIR. I feel that this project is trying to be pushed through without the entire picture being viewed. 24-6

The Big Bear Valley is a beautiful place with many underlying problems, fire danger, water shortages, supply issues, electrical issues requiring the building of a new generator for peak overloads that we *already* have.

Please don't make it worse for the sake of a few dollars. We can have growth in the area that allows everyone to enjoy why we moved here in the first place. This project isn't it.

Sincerely,
Christine Florio

PO Box 84
1154 Chickasaw Lane
Fawnskin CA 92333

Response to Commentor No. 24
Christine Florio
May 10, 2004

24-1 The County will consider the Commentor's opinion and comments during their deliberation on the project.

24-2 Commentor refers to the accuracy of the current Fire Risk Level designation, increased traffic and affects to evacuation plans. Please refer to Response to Comment Nos. 4-1, 4-4 and 13-27 to 13-36, which address these concerns. The County will consider the Commentor's opinion and comments during their deliberation on the project.

24-3 Commentor refers to SB221 reporting requirements, water supply and affects to groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5 and 13-42, which address these concerns. The County will consider the Commentor's opinion and comments during their deliberation on the project.

24-4 Commentor refers to development of the project area and affects to the existing aesthetic character. Please refer to Response to Comment Nos. 13-12, 13-54, 13-55, which address these concerns. The County will consider the Commentor's opinion and comments during their deliberation on the project.

24-5 Commentor refers to impacts to the bald eagle. Please refer to Response to Comment Nos. 3-7, 13-86, 13-88, 13-95 and 41-14, which address this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

24-6 The County will consider the Commentor's opinion and comments during their deliberation on the project.

EVERETT H. GREENBERG
P.O. Box 130646
Big Bear Lake, CA 92315
(909) 585-3176

RECEIVED
MAY 11 2004
CURRENT PLANNING

RECEIVED
MAY 1..
LAND USE SE...
ADVANCE PLANN...

May 10, 2004

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182
Attn: Matthew W. Slowik

Re: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES, INC.: GENERAL PLAN AMENDMENT/OFFICAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Sir,

Thank you for the opportunity to address some of the significant negative impacts this project would have on the community of Fawnskin and the Big Bear Valley.

SECTION 5.3.6 WATER: We are now in our sixth year of severe drought with no relief in sight. We do not import water from outside sources like most of the communities down the hill. The only water we receive is from precipitation in the form of rain and snow. The water company has established Conservation Stage II which mandates a ten percent reduction in water use, no new turf and a thirty percent reduction in outdoor water use. Additional development would have a severe adverse effect on an already stressed water system. 25-1

SECTION 5.1.3 CUMULATIVE IMPACT: If this zone change is approved it would have a significant negative impact on the area. We are presently facing water shortages and the need to build additional electric generating facilities just to meet the needs of the existing population. We also must face the immediate fire danger in our local mountains. Last 25-2

fall's fires pointed out the problems of evacuating this area. There are only three paved roads out of this valley. Also, additional fire and law enforcement resources would be required in order to serve the increased population and homes. I'm sure that by cutting down trees in order to re-route the Scenic Byway would reduce the highway to a Non-Scenic Byway. 25-2

As a long-time resident of this valley I urge you not to grant this zone change. It is my opinion that it would have a significant negative impact on this valley.

Again let me thank you for the opportunity to address this issue.

Sincerely,

Cc: Friends of Fawnskin

Response to Commentor No. 25
Everett H. Greenberg
May 10, 2004

25-1 Commentor refers to water supply and affects to groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5, 13-47 and 18-1, which address this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

25-2 The Commentor has provided general comments regarding water resources, electrical service, fire hazards, law enforcement services, evacuation plans and aesthetics. Impacts regarding evacuation of the area are discussed in Response to Comment No. 13-32. The County will consider the Commentor's opinion and comments during their deliberation on the project.

RECEIVED
MAY 1 1 2004
LAND USE SERVICES DEPT
ADVANCE PLANNING DIVISION

County of San Bernardino,
Land Use Department/Planning Division
385 North Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

ATTN: Matthew W. Slowik

RESPONSES/COMMENTS/OBJECTIONS TO DRAFT EIR FOR MOON CAMP EIR, TENATIVE TRACT MAP 16136

GENERAL COMMENTS

1. The EIR failed to adequately assess the collective or combined effect of both the project in question and other foreseeable projects (Marina Point and the 70 acres also in Fawnskin). See Kings County Farm Bureau v. City of Hanford, 221 Cal.App. 3d 692. 26-1
2. The EIR failed to consider that there is still no defined water supply for the project. 26-2
3. The EIR failed to consider the effect of recent fires on growth and development in the mountain areas. 26-3
4. The EIR failed to delineate mitigation factors. It also failed to mention who will monitor and enforce such mitigation. Counties are notorious for not monitoring and enforcing mitigation. The EIR does mention some mitigation as being subject to CC&R's. However, the County will not enforce those CC&R's. Such mitigations are therefore illusionary. 26-4
5. The EIR failed to consider input from California Department of Transportation, the United States Forest Service, and the California Department of Fish and Game, and the Army Corps of Engineers. Therefore, the EIR should be recalculated in order to receive input from those agencies. 26-5
6. The EIR does not adequately address the impact of changing the zoning from R-40 to R-1. The EIR failed to specify why this, and other impacts, would be less than significant. Who has determined that the proposed zone change would be in the "public interest"? 26-6

SPECIFIC COMMENTS

1. Section 1.6. The County of San Bernardino has a history of not following its own General Plan. 26-7
2. Section 5.2. The EIR failed to consider that all land below the high water line of Big Bear Lake is open to the public. Both Marina Point and Eagle Point had to provide for public access to the lake. Moon Camp should be required to likewise provide such public access. 26-8

3. Section 5.2. The EIR failed to consider the impact of traffic, parking, and storage at the proposed 100-slip marina. 26-9
4. Section 5.4. The EIR failed to consider the requirements of the San Bernardino County Light Ordinance, which has been adopted by CSA 53B. The proposed project is included in the CSA 53B area. 26-10
5. Section 5.4. The simulated views fail to adequately depict what the view shed will be if SR 38 is realigned. The depicted structures are not in proportion to the site, are not spaced according to the plot plan, and are not show at full buildout. Eagle Point and Castle Glen, both products of the same developer, are more realistic of the type of structures that are currently being built in the Big Bear Valley, and with six-foot side setbacks, there would be no effective view of the lake and beyond. 26-11
6. Section 5.4. The EIR failed to consider the impact the project would have on the view from the lake. At both Hamilton Ranch and Papoose Bay the view from the lake has been blighted by construction of houses along the shore. Recently, Lake Tahoe passed an ordinance prohibiting the construction of "monster homes" along the shoreline. This was done to protect the viewshed from the lake. 26-12
7. Section 5.5.31. The EIR failed to state why the developer is only paying a pro rata share of a traffic signal at Stanfield Cutoff. If their project causes the impact, why not should they bear the full cost? 26-13
8. Section 5.7.2 The EIR failed to consider funneling effect of noise from the highway into the adjacent residential areas. Noise from the highway is naturally amplified as it progresses up the hillside. 26-14
9. Section 5.7.2 also failed to the increased noise caused by higher speeds on the straightened highway. 26-15
10. In addition to the above sections and other traffic sections, the EIR failed to consider the cumulative impact of the proposed project, and other projects in the Big Bear Valley which will dump additional traffic onto the only three paved roads in and out of Big Bear Valley in the event of an emergency evacuation. 26-16
11. Section 5.8. Although mitigation measures are proposed to mitigate the impact on eagle habitat. The EIR failed to recognize that in prior developments in Big Bear, where eagle mitigations were instituted, the eagles were effectively driven from those projects. 26-17

Respectively Submitted,

Robert S.Drake
P.O. Box 164
Fawnskin, CA 92333
(909)866-2262

Response to Commentor No. 26
Robert S. Drake
May 11, 2004

26-1 Commentor refers to cumulative impacts associated with other foreseeable projects. Please refer to Response to Comment No. 13-2, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

26-2 Commentor refers to water supply and affects to groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, and 1-5, which address this concern.

26-3 Commentor refers to fire risks associated with development of the project vicinity. Please refer to Response to Comment Nos. 4-1, 4-4, and 13-27 to 13-36, which address this concern.

26-4 Commentor refers to the enforcement process and procedures for implementation of mitigation measures. Please refer to Response to Comment No. 13-4, which addresses this concern.

26-5 Commentor refers to lack of consultation with various governmental agencies. Please refer to Response to Comment No. 13-5, which addresses this concern.

26-6 Commentor refers to the Project's consistency with the County General Plan. Please refer to Response to Comment No. 13-9, which addresses this concern.

26-7 The County will consider the Commentor's opinion and comments during their deliberation on the project.

26-8 Commentor refers to the decrease of public access along the lakeshore. Please refer to Response to Comment No. 13-26, which addresses this concern.

26-9 Commentor refers to the marina facility and affects to traffic, parking and the existing aesthetic character. Please refer to Response to Comment Nos. 2-2, 13-20, 13-24 and 13-56, which address these concerns.

26-10 Commentor refers to light and glare impacts associated with development of the project area. Please refer to Response to Comment No. 13-52, which addresses this concern.

26-11 Commentor refers to the visual simulations not being reflective of build-out of the project area. Please refer to Response to Comment Nos. 13-54 and 13-55, which addresses this concern.

26-12 Commentor refers to impacts to views from the lake as a result of development of the project site. Please refer to Response to Comment Nos. 13-54 and 13-56, which address this concern.

26-13 The pro-rata share of the off-site improvements represents a fair share contribution by the Project Applicant to pay for the identified traffic improvements. It is recognized that existing development, the proposed project and future development projects contribute to existing and/or future roadway system deficiencies. Thus, it is appropriate for the proposed project to pay for a portion of the identified traffic improvements, as it would contribute a portion of the future traffic to the street system. Also, refer to Response to Comment No. 13-61.

26-14 Commentor refers to the funneling noise effect from increased traffic. Please refer to Response to Comment No. 13-80, which addresses this concern.

26-15 Although high vehicle speeds are conceivable along the straightened State Route 38, the modeling utilized the highest maximum-posted speed. Modeling the posted maximum speed is widely accepted acoustical methodology, as using an empirical observation would vary based upon particular driving habits and could lead to a skew in the results. The modeling represents the worst-case scenario in the evaluation of potential traffic-generated noise impacts on noise sensitive land uses (e.g., schools, residential and assisted care facilities). As indicated in Section 5.7, *Noise*, a 3.0-dBA change in noise levels is considered to be the minimum change in noise levels that is discernable by human hearing. As the proposed project does not exceed the thresholds in Table 5.7-6, *Significance of Changes in Cumulative Noise Exposure*, or those developed by the County of San Bernardino, a less than significant impact would result.

26-16 Commentor refers to increased traffic and affects to evacuation plans. Please refer to Response to Comment No. 13-32, which addresses this concern.

26-17 Commentor refers to impacts to the bald eagle. Please refer to Response to Comment No. 13-88, which addresses this concern.

RECEIVED
MAY 17 2004
LAND USE SERVICES
ADMINISTRATION

May 11, 2004
817 Coronado Terrace
Los Angeles, CA. 90026

Via U.S. Mail and Fax (909) 387-3223

Mr. Matthew W. Slowik
County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Mr. Slowik,

We are writing to request that the County extend the deadline of May 17, 2004 for public responses to the DEIR for the Moon Camp Development Project. The DEIR is a very large complex document, which requires extensive time to research and evaluate.

27-1

RBF Consulting had two years to compile all of this information, giving the public a short six-week period to read, research and review the DEIR is not really fair to all involved and impacted by this proposed project. In addition, many reports and documents are referred to, but not included, in the DEIR, requiring additional time needed for research prior to comment.

We appreciate your considering our request for an extension. We may be reached at (213) 413-2460, fax (213) 413-6162, as well as the address above. Thank you for your consideration. We look forward to your response.

Sincerely,

Joseph Francuz

Barbara Francuz

Response to Commentor No. 27
Joseph and Barbara Francuz
May 11, 2004

27-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

May 11, 2004

County of San Bernardino
Land Use Services Department
Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

Attention: Matthew W. Slowik

To Whom It May Concern:

SUBJECT: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES, INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Thank you for the opportunity to review the Draft EIR.

I oppose this Moon Camp project as presently designed because the DEIR fails to evaluate the true impact this proposed project would cause to the critical issue of water. Section 5.3-6 states that the groundwater is already in overdraft condition. Why add to the environmental stress the North Shore is already feeling with water restrictions and the trees dying due to beetle infestation because of the drought? **28-1**

Section 5.7 states that short-term (construction), long term, watercraft and cumulative noise would be less than significant. Many residents and vacationers staying on the North Shore are buying property there explicitly to escape the noise of the south shore or the cities below. Fawnskin residents are able to hear motorboats from across the lake, air traffic from the airport, and traffic from route 38. The Moon Camp project would not only provide noise pollution for it's current residents but the proposed Moon Camp residents and South Shore residents would certainly be affected by the noise pollution. **28-2**

Sincerely,

Jane E. MacNett

402 MUSEUM DRIVE
LOS ANGELES, CA 90065

Response to Commentor No. 28
Jane E. MacNett
May 11, 2004

28-1 Commentor refers to water supply and affects to groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5, 18-1 and 21-3, which address this concern.

28-2 Noise associated with the project would adhere to the standards and regulations set forth by the State of California and County of San Bernardino. Additionally, boating operations shall comply with the Big Bear Municipal Water District guidelines in regards to watercraft noise. According to the analysis conducted, vehicle noise generated from the proposed residential project would not increase noise levels within the area by more than 1dBA over "No Project" levels. In addition, air traffic from the airport is out of the scope of this DEIR since airports are not located within the vicinity of the project. Generally, residential neighborhoods are not a significant source of stationary noise pollution. Additionally, please refer to Response to Comment Nos. 13-85 and 26-15.

May 11, 2005

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Ave. 1st Floor
San Bernardino, CA 92415-0182

Attn: Matthew W. Slowik

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Sir,

We would like to thank you for allowing us to review the Draft Environmental Impact Report. We have many issues with the proposed project and these are a few of them.

Section 5.1-2 Zoning Change. The DEIR states that according to the General Plan, a Land Use District Change requires that four statements listed be true. Number one and number four are not true. Number one states, the proposed land use district change be in the public interest. In the community of Fawnskin you will find that nine out of ten people are against this project. Number four states the proposed change will not have a substantial adverse effect on surrounding property. We think this project will change this community significantly. The property is now open space and much of it ties in with the National Forest. This supplies habitat for wild animals and gives them access to the lake. Changing the zoning to RS/7200 and building 92 houses with a gated community will block off this access. 29-1

Section 5.1-3 Cumulative Impact. There are other tracts Marina Point, one on Bruin Trail and the Big Bear Animal Park proposed for the North Shore area. These projects will have a major impact on the Fawnskin community. 29-2

Section 5.3-1 Fire Protection. This is one of our major concerns. The mitigations listed for Fire Protection is sprinkler systems in all the homes. This does not take into consideration that 90% of the calls are for medical aid. The Old Fire should teach us one thing. We are not prepared to evacuate people off the mountain in an emergency. We had four days warning and there were no tourists in the valley when we were told to evacuate. It still took some people over four hours to get off the mountain. That was with an alternate route opened up. Had the fire been near the Big Bear valley and only one route available there could have been many lives lost and extreme panic in the area. The county should not think of adding more people to the valley with the drought we are in and the condition of our forest. 29-3

Section 5.3-6 Water; The DEIR states this project is exempt from Senate Bill 221. Fawnskin water supply is independent from the rest of the Department Of Water And Power service area. We are only supplied by the wells in Fawnskin. The Fawnskin service area has 673 connections at this time. The addition of 92 connections is a 14% increase so this law applies. The potential wells to service this project were dug in 1987. Reviewing the historic rainfall tables this was in a normal rainfall cycle. We are in our sixth year of well below normal rainfall. There should be more tests of these wells and the entire North Shore agua system before any zone change could be considered. We have been warned of possible restrictions of water use including no outdoor watering this summer. We think the water issue is one of the most important issues of the DEIR and should be addressed before any zone change would be considered. 29-4

Sincerely

James C. McGrew

James C. McGrew

Lola E. McGrew

Lola E. McGrew

39760 Flicker Road
P. O. Box 493
Faenskin, CA 92333-0493

Response to Commentor No. 29
James C. McGrew and Lola E. McGrew
May 11, 2004

29-1 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment Nos. 13-9, 13-10, 13-16 and 13-91. The County will consider the Commentor's opinion and comments during their deliberation on the project.

29-2 Commentor refers to cumulative impacts associated with other foreseeable projects. Please refer to Response to Comment No. 13-2, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

29-3 Commentor refers to mitigation measures for fire protection services, increased traffic and affects to evacuation plans. Please refer to Response to Comment Nos. 4-1, 4-4, and 13-27 to 13-36, which address these concerns. The County will consider the Commentor's opinion and comments during their deliberation on the project.

29-4 Commentor refers to reporting requirements of SB221, water supply and affects to groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5, which address groundwater conditions; refer to Response to Comment Nos. 13-42, which addresses SB221; refer to Response to Comment Nos. 13-43 and 13-48, which address wells in the project vicinity; refer to Response to Comment No. 13-44, which addresses well testing; refer to Response to Comment Nos. 13-47 and 18-1, which address water conservation measures; and refer to Response to Comment No. 21-3, which addresses cumulative water impacts. The County will consider the Commentor's opinion and comments during their deliberation on the project.

ROBINS, KAPLAN, MILLER & CIRESI L.L.P.

ATTORNEYS AT LAW

SUITE 3700
2049 CENTURY PARK EAST
LOS ANGELES, CA 90067-3211
TEL: 310-552-0130 FAX: 310-229-5800
www.rkmc.com

RECEIVED
MAY 2004

ROMAN M. SILBERFELD

May 11, 2004

VIA FACSIMILE AND U.S. MAIL (909) 387-3223

Mr. Matthew W. Slowik
County of San Bernardino
Land Use Services Dept., Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

Re: Draft EIR for the Moon Camp Development Project/RCK Properties, Inc.: General Plan Amendment/Official Land Use District Change from BV/RL-40 to BV/RS-7200 and Amendment to County Circulation Element for Realignment of North Shore Drive; Tentative Tract Map #16136, and Conditional Use Permit for a Boat Dock

Dear Mr. Slowik:

I am writing to request that the County extend the May 17 deadline for public responses to the DEIR for the Moon Camp Development Project. We request an extension of 90 days. The DEIR is a lengthy document, difficult to read and understand, and it requires extensive time to evaluate properly. There are many very complex impacts presented by this project and a long list of documents and reports referred to in the DEIR have not been provided. We are spending a great deal of extra time finding and reviewing the information in these other documents, plus locating information on issues that were omitted from the DEIR. 30-1

Thank you for your consideration in this request. I look forward to hearing from you.

Very truly yours

Roman M. Silberfeld

RMS:jt

Response to Commentor No. 30
Roman M. Silberfeld
May 11, 2004

30-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

WM. HAZEWINKEL & CO.

RECEIVED
MAY 1 ' 2004

ay 12, 2004

t. Matthew W. Slowik
ounty of San Bernardino
nd Use Services Department, Planning Division
5 N. Arrowhead Ave., First Floor
n Bernardino, CA 92415-0182
a Facsimile and US Mail

E: DRAFT EIR for the Moon Camp Development Project/RCK
operties Inc.: General Plan Amendment/Official Land Use District
ange; Tentative Tract Map #16136, & conditional use permit for a
at dock.

ear Mr. Slowik,

espectfully request that the County extend the May 17th deadline for the public to comment
the Draft EIR for the Moon Camp Development Project. This document is extremely
ng and requires a huge amount of time to review and comment upon. In addition, it refers
a lot of documents that should be reviewed as well, but they are not provided in the Draft
R. 31-1

residents and business owners in Fawnskin, we are very concerned about the significant
pacts upon our community that a proposed project of this magnitude would have, and feel
should be given adequate time to review this document, and provide our comments.

ank you for considering our request.

William C. Hazewinkel

illiam C. Hazewinkel

PO BOX 378, FAWNSKIN, CA 92333-0378 PHONE (909) 878-5577 FAX (909) 878-2249

Response to Commentor No. 31
William C. Hazewinkel
May 12, 2004

31-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

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MAY 1[illegible] 2004
LAND USE SERVICES DEPT
ADVANCE PLANNING DIVISION

DRAFT

ROBERT R. HENRICH
P.O. BOX 282
FAWNSKIN, CA 92333
Phone 909-866-3300
Fax 909-866-4222
E-mail rileyh@hotmail.com

Wednesday, May 12, 2004

Matthew W. Slowik
Land Use Services Department
Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RE: **DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.,GENERAL PLAN AMENNDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/rl-40 TO BVRS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE;TENTATIVE TRACT MAP #1636, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.**

Dear Mr. Slowik:

I am writing to request that the County extend the May 17th deadline for public responses to the to the DEIR for the Moon Camp Development Project. There is a long list of documents and reports referred to in the DEIR but not provided. We need time to find these documents and review them. 32-1

Thank you for your consideration.

Sincerely,

Robert R. Henrich

Response to Commentor No. 32
Robert R. Henrich
May 12, 2004

32-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

May 12, 2004

RECEIVED
MAY 13 2004
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIV.

County of San Bernardino
Land Use Services Department
Planning Division
385 N. Arrowhead Ave
First Floor
San Bernardino, Ca 92415-0182
Attn: Mr. Matthew W. Slowik

Re: Draft EIR for the Moon Camp Development Project.RCK Properties Inc: General Plan Amendment/Official Land Use District Change From BV/RL-40 to BV/RS-7200 and Amendment to County Circulation Element For Realignment of North Shore Drive; Tentatvie Tract Map #16136, And Conditional Use Permit For A Boat Dock.

Dear Mr. Slowik:

Thank You for the opportunity to review this document. After review I oppose the proposed Moon Camp project because the DEIR fails to adequately evaluate the true impact this proposed project would cause to the following critical issues:

In section 5.1-2, the DEIR states that according to the General Plan, a Land Use District Change requires that each of the following statements be true:

1) The proposed land use change is in the public interest, there will be community benefit and other existing and permitted uses will not be compromised. **OBJECTION**: This proposed project is NOT a community benefit. This proposed change will benefit the developer exclusively. **33-1**

2) The proposed land use change is consistent with the goals and policies of the General Plan, and will provide a reasonable logical extension of the existing land use pattern in the surrounding area. **OBJECTION:** The majority of the property boundaries are bordered by National Forest Land or the Lake, the proposed change from rural to residential is not a logical extension. **33-2**

3) The proposed land use change will not have a substantial adverse effect on surrounding property: **OBJECTION:** The proposed change DOES have an adverse effect on surrounding property. The area is rural surrounded by National Forest and Lake; this proposed change will overburden this small parcel jeopardizing the surrounding properties by further depleting Fire Protection, Police Protection, Water Shortage, Wastewater, Noise & Lighting Glare. **33-3**

In section 5.2-3, the DEIR states that this proposed project, combined with other future development, would increase the intensity of land uses in the area, but concludes that the impacts are less than significant. **OBJECTION**: The cumulative effect of this proposed **33-4**

project, plus the proposed Marina Point development, plus the proposed Brook side project, plus the expansion of the Discovery Center to handle more visitors, plus all the developments on the other side of the lake, given the water shortage, electricity shortage, fire danger, lack of evacuation abilities all go together to create an Extremely Significant Impact. Analyzing this project alone is a completely invalid, misleading and understated option. Cumulative impacts are significant. 33-4

Section 5.8- Biological Resources. Although Biological Resources did not take into account the loss of trees in the evaluation. While a mitigation for eagles states that all trees over 20 inches in diameter will be protected, it does that only on individual lots and does not hold the developer to that standard for cutting roads and other structural changes required for the proposed project. Therefore, the analysis is misleading in pretending that this mitigation will protect the eagle perch trees. The analysis does not include ospreys, common visitors to the site. The bark beetle infestation coupled with the drought is destroying the forest. To further remove healthy trees for development will impact the wildlife. 33-5

The analysis is insufficient because it doesn't address the impact of the objections stated above. The negative impact should the proposed project be approved will be very significant to the community of human life and wildlife. In final, I close by saying "Cumulative Impacts are Significant" and further analysis is required to adequately address this proposed project. 33-6

Sincerely,

Lindi Holland
28081 Morro Court
Laguna Niguel, Ca 92677

100 Pine Oak Lane
Fawnskin, Ca

Response to Commentor No. 33
Lindi Holland
May 12, 2004

33-1 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-9, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

33-2 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-10, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

33-3 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-16, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

33-4 The Commentor refers to Impact Statement 5.2-3, which regards cumulative impacts associated with adverse physical effects to the environment as a result of recreational facilities. As the proposed project includes a marina facility, all construction activities would be subject to review and approval by the Big Bear Municipal Water District, which includes obtaining a Shorezone Alteration Permit. Each of the proposed developments identified by the Commentor would be responsible to mitigate incremental impacts to recreational facilities to less than significant levels. Also, refer to Response to Comment No. 13-2. The County will consider the Commentor's opinion and comments during their deliberation on the project.

33-5 Commentor refers to impacts to biological resources from tree removal, as well as impacts to the bald eagle and osprey. Please refer to Response to Comment No. 13-87, which addresses impacts to the Osprey; refer to Response to Comment No. 13-86, which addresses tree removal; and refer to Response to Comment Nos. 3-7, 13-88, 13-95 and 41-14, which address impacts to the bald eagle.

33-6 The County will consider the Commentor's opinion and comments during their deliberation on the project.

Anne Browning McIntosh AICP
City Planning and Administration

May 12, 2004

MAY 2004
PLANNING

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182
ATTN: MATTHEW W. SLOWIK

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT- GPA, LAND USE CHANGE, TTM #16136, AND CUP

220 Highland Place
Monrovia, California 91016
Phone: (626) 357-9395
Fax: (626) 357-9286
Cell: (626) 665-3683

Dear Mr. Slowik:

I have read the Draft EIR for the Moon Camp development. This letter represents my comments on the Draft document.

Although I am concerned about all impacts of this project that may degrade the environment of the San Bernardino Mountains for years to come, I am particularly concerned about the inadequacy of the EIR in suggesting appropriate mitigation measures, which could mitigate the **LAND USE** and **AESTHETIC** impacts.

34-1

My overall concern is that the applicant and the EIR consultant believe that a 1970s suburban style subdivision development is appropriate for Fawnskin. The design of this project, from tract map to road design, to public improvements, to housing type reflect a development that is SO inappropriate for Fawnskin that it is difficult to even begin with suggestions. Architecture and land use planning has come so far in the past 30 years. A much more appropriate treatment of this land is possible with the right environmental analysis and design work.

Following are points that should be addressed:

- (Refer to p, 2-2: 5.1-1) The San Bernardino County General Plan was written in 1989 and updated in 2001. Even with both of these updates, the land use designation for this site was determined to be RL-40. The County apparently did not choose to redesignate this property during the preparation of the General Plan or during the recent update. General Plans are intended to establish long-range planning policies. Therefore, the adoption of such a radical amendment to the Land Use Element, not based on a long-term view, but rather in reaction to a tract map request for a much higher density, IS an **unavoidable, significant impact.** To say that the requested amendment to the General Plan mitigates the land use impacts is a circular argument and does not meet the intent of CEQA to evaluate land use policy impacts.

34-2

- (Refer to p 5.1-6) The County policy LU-2a requires that the "design and siting of new residential development **meet locational and development standards that**

34-3

anne@browningmcintosh.com
www.browningmcintosh.com

ensure compatibility with adjacent land uses and community character." This project does not meet this standard. This "residential subdivision" has been designed as a 1970s suburban, (NOT RURAL MOUNTAIN COMMUNITY) housing development complete with cul-de-sacs. It bears no resemblance to the development pattern of Fawnskin. Therefore, among the mitigation measures that should be included are:

- "redesign of the tract map to reflect the rural development pattern of the adjacent Fawnskin community including, but not limited to the prohibition of cul-de-sacs, gates, monument signs, and other features that reflect suburban rather than rural development." 34-3
- All properties on the south side of the highway shall be "through" properties – with frontage on the highway as well as the lakefront to be consistent with existing development patterns on North Shore Drive.
- "Imposition of development standards that maintain the character of a mountain community" (more on this below.)

(Refer to 5.4-2 and corresponding mitigation measures) I wholeheartedly agree with the conclusion that long-term impacts on aesthetics and scenic vistas would be significant and cannot be mitigated to a level of insignificance (except with a reduced density project). However, I believe that **there are a number of additional mitigation measures that CAN and SHOULD be required to reduce the impacts as much as possible**:

- "For properties located to the south of the scenic highway, no cul-de-sacs shall be permitted so that views to the lake from the scenic highway are not blocked and so that existing land use development patterns are maintained."
- **Remove** mitigation measure 5.4-2b. Two car garages with automatic openers do not say "mountain home" and should not be mandated. This requirement constitutes a project impact – NOT a mitigation measure! 34-4
- **Rewrite** mitigation measure 5.4-2c to require a view study for each lot, not a standard formula for all lots.
- **A mitigation measure should be written that defines specific property standards for each lot. These should be developed by a renowned land use designer, should be included in the environmental document as required mitigation measures and should require the following AT A MINIMUM:**
    - A minimum of 30 foot distances between residential structures (or whatever distance is deemed appropriate by the land use designer);
    - Traditional mountain architecture (i.e. log cabin, Maltby, chalet, etc.) must be used and cannot be uniform throughout the development.
    - Native materials such as wood, rock, log, tin, etc. shall be incorporated into all structures
    - There must be a range in housing sizes with a maximum of 2,500 square feet (or whatever is deemed consistent by the land use designer);
    - A conditional use permit shall be required for all structures located south of the highway;
    - Curbs, sidewalks and gutters shall be prohibited.

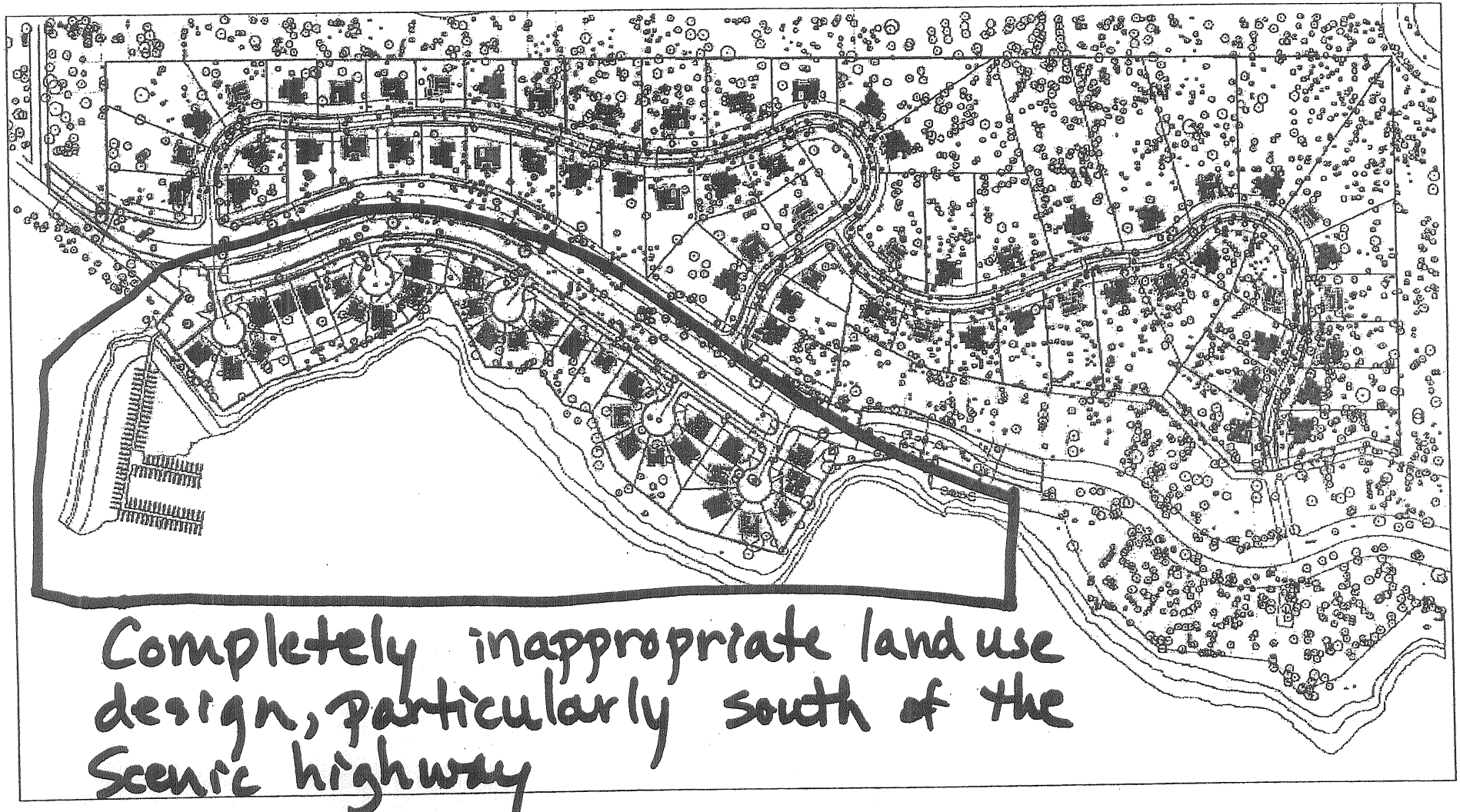
- Property line fences cannot be built as part of the development and will be discouraged subsequently. 34-4

- (Refer to 5.4-3 and corresponding mitigation measures) I wholeheartedly agree that impacts on views from a scenic highway will be impacted and will be significant and cannot be mitigated to a level of insignificance (except with a reduced density project). However, I do not believe the mitigation measures are appropriate and go far enough to mitigate what CAN be mitigated. **There are a number of additional mitigation measures that CAN and SHOULD be required to reduce the impacts as much as possible**: 34-5
  - Mitigation measure 5.4-3a should be rewritten to PROHIBIT "entry signs". There should be no "entry" because this development should not appear as a planned development or suburban subdivision as stated above. There should be no walls, no gates, no artificial barriers.
  - A mitigation measure should be added that specifies that lots should be left in their native condition with native plantings ONLY. Lawns and other high water usage landscaping should be prohibited. Reforestation must occur in areas where mature trees and native plantings are removed.
- (Refer to 5.4-4 and corresponding mitigation measures). There should be NO STREET LIGHTING permitted. Again, Fawnskin is rural in nature. 34-6
- (Refer to Chapter 7 – project alternatives). My belief is that the County must seriously consider a "Reduced Project" alternative because such a project can reduce impacts to a level of insignificance. However, this EIR does not adequately evaluate either of the two suggested reduced project alternatives so that the County can make an informed decision. Among other analyses, the view analysis conducted for the project (Exhibits 5.4-1 to 5.4-7) should be conducted for the reduced project alternatives. 34-7

In summary, the proposed project, as designed, is completely inappropriate. Further analysis must be conducted regarding appropriate mitigation measures in the areas of land use, aesthetics, scenic highways and reduced project alternatives for this project.

Sincerely,

Anne Browning McIntosh, AICP
Property Owner – 1053 Bruin Trail, Fawnskin



Completely inappropriate land use design, particularly south of the Scenic highway

Not to Scale

RBF CONSULTING PLANNING ▪ DESIGN ▪ CONSTRUCTION

03/04 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT
Plan View

Exhibit 5.4-3

Response to Commentor No. 34
Anne Browning McIntosh, AICP
May 12, 2004

34-1 The County will consider the Commentor's opinion and comments during their deliberation on the project.

34-2 The County will consider the Commentor's opinion and comments during their deliberation on the project.

34-3 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-20, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project. It is further noted that there is no "prohibition" of cul-de-sacs, gates, monument signs, etc., in the Big Bear Lake area. Please refer also to Section 7.0, *Alternatives to the Proposed Project*, of the EIR which presents reduced density alternatives.

34-4 It is noted that the Commentor agrees with the conclusion that long-term impacts on aesthetics and scenic vistas would be significant and cannot be mitigated to a level less than significant. The project is proposed to be designed to comply with mountain development standards.

34-5 Please refer to Mitigation Measure 5.3-6d regarding water conservation measures.

34-6 The street lighting is required to comply with the adopted Night Sky Ordinance and Mitigation Measure 5.4-4a refers to the incorporation of low intensity lighting.

34-7 The County will consider the Commentor's opinion and comments during their deliberation on the project.

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MAY 17 2004
ADVANCE PLANNING

May 12, 2004

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

Attn. Matthew W. Slowik

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Sir,

I am writing in response to the May 17 cut off date for responses to the Draft Environmental Impact Report for the above named project. The report is written in language that is difficult for the average person to read. There are other documents that would be helpful to read in reviewing this DEIR. 35-1

Please consider extending the date for comments on the DEIR so that more people can comment on this project.

Thank You,

James C. McGrew

James C. McGrew
39760 Flicker Road
P. O. Box 493
Fawnskin, CA 92346-0493

Response to Commentor No. 35
James C. McGrew
May 12, 2004

35-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

ERVIN NICHOLS

P.O. Box 434
Big Bear Lake CA
92315
en1258@earthlink.net

May 12, 2004

Matthew W. Slowik
Land Use Services Department
Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIESS INC. GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BVRS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #1636, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Mr. Slowick,

I am opposed to the Moon Camp project as currently proposed for many reasons. Some of which I am listing below.

Under "Land Use Element", section LU-2, (a), this project does not ensure compatibility with adjacent land uses and community character. The community of Fawnskin has no projects resembling anything of this size. The adjacent land is Forest service or low-density single family lots and homes. This project would alter the atmosphere of the whole community adversely. 36-1

Section 5.3-2, Police Protection. The EIR states no mitigation measures recommended. This does not take into consideration the addition of 100's of residents, especially on holidays, that will need patrolling and crime prevention when, at present, there is already a lack of deputies available for these services. 36-2

Section 5.3-9 lists the alternative of a distributed generation option. This does not address the fact that such an option would create noise pollution as well as air pollution and be disruptive to neighbors and wildlife. 36-3

Section 5.3-10 states "The inability of water providers to confirm service on a project level would also result in significant and unavoidable cumulative impacts." This is a problem that can't be solved or mitigated and should be reason enough for rejection of the project as proposed. 36-4

Section 5.4, Scenic Corridors. This whole section is unmitigatable. For instance, Building and Structure Placement "The building and structure placement shall be compatible with and should not detract from the visual setting or obstruct significant views." The EIR does not address the fact that placing 93 homes on this property would not only obstruct the home owners views, but would impair or eliminate the views of residents on the hillsides above, lowering property values and nullifying why they built there in the first place. 36-5

The conclusion in Section 5.4-2 is correct and good reason why the project should not be approved as proposed.

Section 5.5. Nowhere in this EIR does it address the fact that neighboring (within an eighth of a mile) Serrano Campground has as many as 1600 guests on a summers' day or that the relocation of the Moonridge Zoo (1/2 mile from the project site) will bring hundreds of visitors daily to the North Shore or the fact that the Discovery Center (1/4 mile from the project site) has nearly doubled it's size and visitor capacity. 36-6

Section 5.8 has too many omissions to document here, but my biggest concern is that it did not properly address the Bald Eagle population and its impacts and completely omitted the Osprey, which in recent years has been returning to the area. 36-7

In conclusion, I feel the EIR is inaccurate and incomplete. Thank you for allowing me to express my concerns.

Sincerely,

Ervin Nichols

Response to Commentor No. 36
Ervin Nichols
May 12, 2004

36-1 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-20, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

36-2 Commentor refers to current police protection services and the Project's impact to police services. Please refer to Response to Comment Nos. 13-38 to 13-40, which address this concern.

36-3 Commentor refers to the potential impacts as a result of constructing an alternative electrical power source on the project site. Please refer to Response to Comment No. 13-49, which addresses these concerns.

36-4 The County will consider the Commentor's opinion and comments during their deliberation on the project.

36-5 Although mitigation measures have been identified to reduce the significance of long-term aesthetic impacts, the EIR concludes that significant and unavoidable long-term impacts would occur regarding viewshed alterations to existing residents to the north, south, east and west of the project site. Additionally, significant and unavoidable impacts have been identified for views from State Route 38, a scenic highway, to the south and from the south shore of Big Bear Lake. Also, refer to Response to Comment No. 13-56. The County will consider the Commentor's opinion and comments during their deliberation on the project.

36-6 The Commentor identifies several projects that will bring visitors to the north shore, especially during the peak summer and holiday weekends. Each of these projects would be required to comply with the California Environmental Quality Act (CEQA) environmental review procedures during their project implementation. At that time, environmental impacts associated with each project would be analyzed and mitigation measures recommended, as necessary. Similarly, the Moon Camp EIR addresses impacts associated with implementation of the proposed project, as well as cumulative project impacts, which include related projects and other possible development in the area determined as having the potential to interact with the proposed project to the extent that a significant cumulative effect may occur. Also, refer to Response to Comment No. 13-2.

36-7 Commentor refers to impacts to the bald eagle and osprey. Please refer to Response to Comment No. 13-87, which addresses impacts to the Osprey; and refer to Response to Comment Nos. 3-7, 13-88, 13-95 and 41-14, which address impacts to the bald eagle.

COMMENT NO. 37

965 Deer Trail Lane
Fawnskin, California 92333

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2004

VIA FAX (909-387-3223) AND U.S. MAIL

May 12, 2004

Mr. Matthew W. Slowik
County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

Re: **Draft EIR for the Moon Camp Development Project /RCK Properties Inc.:**
General Plan Amendment/Official Land Use District Change from BV/RI-40 to BV/RS-7200 and Amendment to County Circulation Element for Realignment of North Shore Drive; Tentative Tract Map #16136, and Conditional Use Permit for a Boat Dock.

Dear Mr. Slowik:

I am writing to request that the County extend the May 17 deadline for public responses to the DEIR for the Moon Camp Development Project. The DEIR is a huge document, difficult to read and requires extensive time to evaluate properly. There are many very complex impacts presented and a long list of documents and reports which have been referred to in the DEIR were not provided, as far as I can tell. I have spent a good deal of time trying to find and review the information in the DEIR and these other documents, plus locating information on issues that were omitted from the DEIR. I would prefer to be able to make specific comments rather than just raise issues, or question items that may be addressed in a way that is not readily found, but this will require additional time. 37-1

Thank you for your consideration of this request. I look forward to hearing from you.

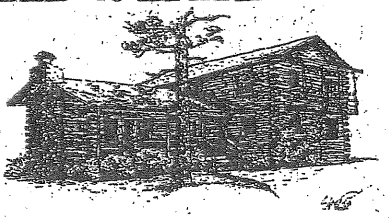
Yours very truly,

Peter J. Tennyson

Response to Commentor No. 37
Peter J. Tennyson
May 12, 2004

37-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

The INN at FAWNSKIN
BED & BREAKFAST



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MAY 1[illegible] 2004
LAND USE [illegible]CES DEPT
ADVANCE PLANNING DIV[illegible]

May 12, 2004

Mr. Matthew W. Slowik
County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182
Via Facsimile and US Mail

RE: DRAFT EIR for the Moon Camp Development Project/RCK Properties Inc.: General Plan Amendment/Official Land Use District Change; Tentative Tract Map #16136, & conditional use permit for a boat dock.

Dear Mr. Slowik,

I would like to request that the County extend the May 17th deadline for the public to comment on the Draft EIR for the Moon Camp Development Project. Because of the length and complexity of this document, it will require an equally long amount of time to review and comment upon. In addition, it refers to a lot of documents that should be reviewed as well, but they are not provided in the Draft EIR. 38-1

As a resident and business owner in Fawnskin, I am very concerned about the significant impacts upon our community that a proposed project of this magnitude would have, and feel we should be given adequate time to review this document, and provide our comments.

Thank you for considering our request.

Nancy Walker

Nancy Walker

880 CANYON ROAD ~ POST OFFICE BOX 378 ~ FAWNSKIN, CA 92333 ~ (909) 866-3200
www.fawnskininn.com ~ innatfawnskin@charter.net

Response to Commentor No. 38
Nancy Walker
May 12, 2004

38-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

817 Coronado Terrace
Los Angeles, CA. 90026
May 13, 2004

County of San Bernardino
Land Use Services Department
Planning Division-1st Floor
Attn: Matthew W. Slowik
385 North Arrowhead Avenue
San Bernardino, CA. 92415-0182

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Mr. Slowik,

Thank you for the opportunity to review this document. As homeowners in Fawnskin, we oppose the proposed Moon Camp project as currently designed, because the DEIR fails to adequately evaluate the immense impact that this projected development would have on the region. Our reasons are as follows:

FIRE PROTECTION AND SAFETY

- Sections 5.3-1 of the DEIR evaluated the fire risk as Level 2. All mountain areas in the County have now been upgraded to fire risk Level 1. Therefore, this DEIR level risk statement and the entire fire protection analysis is invalid. **39-1**

- Nothing was included in the DEIR in the fire protection section that covered evacuations from the Valley in case of wildfire. We had a few days of warning for the October 2003 evacuation, with minimal tourists in the Valley due to the off-season, mid-week, non-holiday time frame. The addition of more houses is a Significant Impact. The DEIR totally understated the potential for the number of persons that could be in homes built within the proposed Moon Camp development, especially if a fire were to happen on a holiday weekend. The neighboring proposed Marina Point project would add substantially to these numbers, as would several on-going developments on the Big Bear side of the Lake. **39-2**
  Even without the panic of fire within the Valley itself during the October exodus, it took over 6 hours to get off the mountain.

- The potential for loss of human life in a fire emergency due to the potential increase in resident population and the much larger increase in weekend population was not addressed in the DEIR. Considering the numbers of dead and dying trees, upwards of 40% presently, this proposed development would create a significant and unavoidable impact on fire protection and safety. **39-3**

- Mitigation measures of fire sprinklers, fire-resistant vegetation and homeowner association requirements totally underestimate the danger and potential loss of human life that wildfire create and downplay the significant impact of this proposed development on fire protection and safety. 39-4

ZONING CHANGES

In section 5.1-2, San Bernardino County Development Code, the DEIR states that according to the General Plan, a Land Use District Change requires that each of the following statements be true:

- "Change is in public interest and there will be a community benefit and other existing and permitted uses will not be compromised." This proposed project would not be a community benefit nor would it benefit the public interest, and in fact would harm the community (for reasons detailed in the other sections of this document). Since this is not a benefit to the public, this proposed zoning change would be a significant and unavoidable impact. 39-5

- "The proposed zoning change is consistent with the goals and policies of the General Plan and will provide a reasonable and logical extension of the existing land use pattern in the surrounding area." The majority of the property boundaries are National Forest or lakeshore; therefore the change from rural to residential is not a logical extension and poses a very significant adverse impact to these surrounding areas. To go from I house per 40 acres (BV/RL40) to a higher density than the city of Los Angeles (BV/RS-7200) is a leap in logic for the area proposed. 39-6

- "The proposed land use change will not have a substantial adverse effect on surrounding property." When we purchased our Fawnskin property, we did due diligence and checked the County General Plan to see what the adjacent property was zoned. Knowing that it was zoned RL-40, we felt confident in purchasing our home. The proposed change to the zoning would affect our property value, destroy our view and permanently alter the characteristic small town ambience of Fawnskin. 39-7

CUMULATIVE IMPACTS

- In section 5.1-3, the DEIR states that this proposed project, combined with other future development, would increase the intensity of land use, but concludes that the impacts would be less than significant. We consider the proposed Moon Camp Development, the proposed Marina Point Development, the proposed Brookside Project, and the expansion of the Discovery Center and proposed Zoo relocation will exert stresses on the water, electric, sewer, traffic patterns, lake, light and air pollution, plant and animal populations, public services (ie. Sheriff and Fire), loss of lake public access and change of area ambiance, to create a sizable negative effect and therefore a significant impact. To analyze the proposed Moon Camp project alone is completely invalid, as cumulative impacts are more than significant. 39-8

RECREATION

- In Section 5.2-1 through 5.2-4, the annual basis of the lake use factor of 9% is very low considering the addition of 275 boats (Moon Camp and Marina Point). As the lake is closed half of the year, the DEIR figures are only half of the potential increase in usage. An annual usage average is not applicable in this circumstance. 39-9

AESTHETICS

- Section 5.4 (Aesthetics) downplays the impact that this proposed project would have on the entire area. The DEIR states that impacts are significant and unavoidable. The DEIR continues with a disclaimer stating that aesthetics is based on a subjective interpretation value. The statements and mitigation options are highly slanted in favor of the proposed development. 39-10

- In the DEIR statements and views in Section 5.4, Density and scale portray smaller, widely spaced homes, not as the proposed development would be in actuality. 39-11

- Roof angles are minimized in the graphics of Section 5.4. Mountain homes require a higher degree of slope for winter conditions. 39-12

- The Section 5.4 graphics do not show the lakeside wall that would make Moon Camp a private gated community. Downplay of this factor in the DEIR falsely understates the loss of views of the lake. 39-13

- The Section 5.4 statement that the proposed buildings would not be anticipated to incorporate reflective glass and also would minimize flat surfaces to reduce glare conditions in completely invalid. This suggests that decks would not be built or would be kept to a minimum. It is a widely known fact that decks are extremely popular on homes in the mountain community affording views. Also, non-reflective glass options would not be a reality due to costs, as windows would be maximized to take advantage of the privatized views. 39-14

All of the above statements and graphic depictions mislead the public as to the total negative visual impact of this proposed project and serve only to downplay the level of the significant and unavoidable impact on aesthetics.

LOSS OF BUSINESS

- At the DEIR scoping meeting held in March 2002, we brought up the loss of business the proposed project would have on the Valley lodge owners. This was not recorded at the meeting, nor was the impact analyzed in the DEIR. Homes purchased as vacation homes are frequently used as vacation rentals. This loss of revenue to lodge owners and restaurateurs needs to be considered in the overall economic well being of the Valley. 39-15

We have only touched on a small sampling of points of concern to us in this letter. Due to the short period of time we were allowed to comment, we were not able to adequately address the other topics we would like to cover. We would appreciate hearing from you and your department on any further action regarding this proposed project.

Sincerely,

Joseph L. Francuz

Barbara Francuz

Barbara Francuz
Fawnskin Homeowners
39787 Flicker Road

Response to Commentor No. 39
Joseph and Barbara Francuz
May 12, 2004

39-1 Commentor refers to accuracy of current Fire Risk Level designation. Please refer to Response to Comment No. 13-27, which addresses this concern.

39-2 Commentor refers to increased cumulative traffic and affects to evacuation plans. Please refer to Response to Comment No. 13-32, which addresses this concern.

39-3 Commentor refers to the urban/forest interface and the increased fire risk associated with project implementation. Please refer to Response to Comment Nos. 4-1, 4-4, and 13-27 to 13-36, which address these concerns.

39-4 Commentor refers to completeness of mitigation measures for fire protection services. Please refer to Response to Comment Nos. 4-1, 4-4, 13-39 and 13-31, which address these concerns. The County will consider the Commentor's opinion and comments during their deliberation on the project.

39-5 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-9, which addresses this concern.

39-6 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-10, which addresses this concern.

39-7 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-16, which addresses this concern.

39-8 Commentor refers to cumulative impacts associated with other foreseeable projects. Please refer to Response to Comment No. 13-2, which addresses this concern.

39-9 Commentor refers to lake usage statistics and affects to recreational activities. Please refer to Response to Comment No. 13-25, which addresses this concern.

39-10 The County will consider the Commentor's opinion and comments during their deliberation on the project.

39-11 Commentor refers to the visual simulations not being reflective of build-out of the project area. Please refer to Response to Comment Nos. 13-54 and 13-55, which address this concern.

39-12 Commentor refers to the visual simulations not being reflective of build-out of the project area. Please refer to Response to Comment Nos. 13-54 and 13-55, which addresses this concern.

39-13 Project implementation would not include the construction of a lakeside wall along the project's southern perimeter. Thus, the view simulations appropriately do not illustrate a lakeside wall feature.

39-14 Mitigation Measure 5.4-4c recommends the use of "minimally" reflective glass, not "non-reflective" glass, to reduce the potential light and glare impacts associated with the proposed residential uses. This is considered a reasonable and feasible mitigation measure to reduce impacts in this regard. The proposed residential uses are anticipated to include potentially large decks. However, the decks would likely consist of wood or other minimally reflective surface material that parallels the ground. Thus, decking is not anticipated to be a significant source of light and/or glare.

39-15 Economic effects are not considered environmental effects under CEQA, and should be considered in an EIR only if they would lead to a physical impact on the environment. Thus, the loss of business as referenced by the Commentor was not addressed in the EIR. Also, refer to Response to Comment No. 13-8.

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MAY 18 2004
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

May 14, 2004

County of San Bernardino,
Land Use Services Department,
Planning Division
385 N. Arrowhead Ave.
First Floor
San Bernardino, CA 92415-0182
ATTN: MATTHEW W. SLOWICK

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RKC PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF
NORTH SHORE DRIVE; TENTATIVE TRACT MAP #13136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Mr. Slowick,

Thank you for the opportunity to review this letter. I live in Fawnskin where the proposed Moon Camp Development Project is to be built. I'm opposed to this Moon Camp Project as presently designed because the DEIR fails to adequately evaluate the TRUE impact this propsed project would cause to the critical issue of water. As you know, the Big Bear Lake region, including Fawnskin is experiencing the sixth year in a row of drought conditions. These include, but are not limited to: water restrictions being placed on businesses and residences, Big Bear Lake being about 15 feet from being full, the closure of public boat launch ramps especially on the North Shore where Fawnskin is located, not to mention the very real threat of a devastating forest fire like the ones we had last October, and the dead and dying trees due to the drought and beetle infestation. We get our water from wells and when the wells dry up we will have to find other more expensive means to bring water to the customers here. Water does not flow uphill so it would be impossible to pipe water in. I believe the development of this Moon Camp Project would put more strain on an already strained water issue up here. 40-1

State Route 38 runs through the proposed project is designated as a "Scenic Highway" by the county and as a "Scenic Byway" by the U.S. Forest Service. It does conclude that the impact with regards to aesthetics would be significiant and unavoidable if this project is approved. That conclusion is drawen even though the ENTIRE section on aesthetics (section 5.4) DOWNPLAYS and UNDERSTATES the impact that this proposed project would have on the entire area. The simulated views DO NOT include the housing density that is proposed, as they are not done to the correct scale. This way is so that they GROSSLY understate the effects on the views. They use views that are photographed and shot between the houses to MISLEAD how it will look from the houses above the proposed project. In addition, the view show an exceptional number of full-grown trees between and near the houses when in ACTUAL construction it would be HIGHLY UNLIKELY that those trees could be worked around rather than cut-therefore the simulated views must be for about 40-100 years in the future when new trees have grown that tall. Also by moving the highway farther back away from the lake, and putting in houses nearer to the lake, you will loose that lake view forever when you drive this "Scenic Highway/Byway" and it won't be scenic anymore. The glare from the lights of this project would block out the ability to get a clear unobstructed view of the stars and celestial formations during the year for those of us in Fawnskin who enjoy looking at the night sky. It would be like viewing the stars at night from a backyard in the Los Angeles area. It is hard to do because of the glare of lights. 40-2

THE DEIR in section 5.7 concludes that the short-term (construction), long-term, watercraft, and cumulative noise would be less than significant. **when we can hear every car pass from nearly everywhere in Fawnskin, this issue must be evaluated as significant. An example of this is the neighbors who live three blocks away were cutting firewood. I heard them cutting. Also when someone has a powerboat out on the lake, I can hear it from my house.** 40-3

As you can see the resulting imapcts on this proposed project would have many negative effects.

Sincerely,

Martha Brown

Martha Brown
P.O. Box 123
Fawnskin, CA 92333

Response to Commentor No. 40
Martha Brown
May 14, 2004

40-1 The County will consider the Commentor's opinion and comments during their deliberation on the project.

40-2 Commentor refers to the visual simulations not being reflective of build-out of the project area. Please refer to Response to Comment Nos. 13-54 and 13-55, which address this concern. The Commentor also refers to light and glare affects associated with project implementation. Please refer to Response to Comment Nos. 13-52, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

40-3 Commentor refers to short- and long-term noise impacts associated with project implementation. Please refer to Response to Comment No. 28-2, which addresses this concern.

Robin and Scott Eliason
PO Box 309
Fawnskin, California 92333
May 14, 2004

Matthew Slowik
County of San Bernardino
Land Use Services Department
385 N Arrowhead Ave. First Floor
San Bernardino CA 92415-0182

Re: Moon Camp Residential Subdivision TT16136 EIR

Dear Mr. Slowik,

Thank you for the opportunity to comment on the Draft Environmental Impact Report for the proposed Moon Camp residential development project, General Plan amendment, land use district change, circulation amendment, tentative tract map, and conditional use permit for a boat dock (collectively, DEIR). As residents of Fawnskin, California, we are strongly opposed to this proposed project. Development of Moon Camp, as proposed, would not be in the public interest and would have substantial adverse effects on surrounding properties and adjacent communities that rely on the same limited resources. We support the rights of the property owner to utilize the property consistent with current land use zoning, but we urge the County not to allow the significant impacts and dramatic adverse change in the character of the area that would occur should this proposed project be approved. Changing the zoning to allow this density of housing during current conditions in the mountains would be irresponsible. 41-1

As a professional biologist (Robin) and professional botanist (Scott) with recognized expertise on the wildlife and plants of Big Bear Valley, we also believe there would be significant impacts to biological resources not fully addressed in the DEIR. Significant impacts to biological resources are downplayed in the DEIR and many would continue to be significant after mitigation. Our comments focus on the errors, faulty assumptions, and omissions in the DEIR, specifically pertaining to biological resources. 41-2

In general, the DEIR understates the extent and significance of biological resource impacts that the proposed project would cause. Furthermore, the expected effectiveness of the proposed mitigation measures at reducing impacts to below significance is exaggerated and unsupported. Specific issues are as follows:

- Drought-year surveys yielded an incomplete assessment of rare plants. For example, *Ivesia argyrocoma* and *Mimulus purpureus* are widespread throughout the "open Jeffery pine" type, and are highly visible from Highway 38 and properties along Flicker Road. 41-3
- Most of the "open Jeffrey pine" type characterized in the DEIR should have been described as pebble plain habitat, based on soils and species composition; as defined in the Pebble Plain Habitat Management Guide developed by the San Bernardino National Forest in 2002. Therefore, approximately 17 acres of pebble plain habitat, not 0.69, would be destroyed. 41-4

Impacts to the entire pebble plains habitat area falls within the mandatory finding of significance for special status biological resources. 41-4

- Proposed mitigation for pebble plain habitat and special status plants is vague, speculative, untested, and probably untenable:
  - Vague: Measures 5.8-1a and g state that a 3:1 ratio is 'typical' but does not specify that this ratio would be required for this project. 41-5
  - Vague: Measures 5.8-1a and g also state that the "project applicant", which presumably includes the proponent as well as subsequent lot owners seeking to build, would pay compensation to fund the purchase and management of off-site habitat. The measure does not specify that this payment must be based on a current appraisal of Big Bear Valley habitat acreage, and an adequate endowment to provide for management in perpetuity. 41-6
  - Vague: It is not clear in the DEIR whether impacts to pebble plains habitat and other special status plants caused by initial construction of roads and infrastructure are subject to mitigation measures 5.8-1a and g. 41-7
  - Speculative: At 3:1, it would be difficult if not impossible to find a willing seller of approximately 50 acres of pebble plains and associated rare plant habitat. This would be about ¼ of the total remaining pebble plain habitat on private land. 41-8
  - Speculative: It would be difficult to find a qualified and willing manager for these conservation lands. The quality of management of private conservation (*i.e.,* mitigation) lands in Big Bear Valley over the last decade has been dismal. 41-9
  - Untested: The California Wildlife Foundation is willing to receive compensation funds and dispense these funds to parties who wish to purchase and manage conservation lands, but they have never done so at this scale or under these conditions. 41-10
  - Untenable: Because of the vague, speculative, and untested nature of 5.8-1a and g, impacts to pebble plains and other special status plants can not be reduced to below significance, nor can it reduce these significant impacts to any verifiable extent. 41-11
- Mitigation measure 5.8-1g fails to specify that the December 1 to April 1 seasonal restriction for bald eagles includes all vegetation clearing, grading, and exterior construction; following strong precedent from all projects on the shore of Big Bear Lake since at least the early 1980s. 41-12
- It is very confusing and misleading to combine in 5.8-1g the bald eagle seasonal restrictions with measures to mitigate impacts to pebble plains. 41-13
- The document understates the expected impacts to Bald Eagles and overstates the extent to which mitigation measures reduce the level of impacts.
  - The initial removal of approximately ¼ of the existing trees on the property, an estimated 655 out of 2,772 trees, is not analyzed with respect to bald eagles, and would apparently not be constrained or reduced by mitigation measure 5.8-1c. 41-14
  - The extent to which bald eagle perch trees can be protected under measures 5.8-1b and c are greatly exaggerated. Any trees that may pose a safety hazard to structures, power lines, telephone/cable lines, or roads can not be protected under the County Code or CC&R's. With the proposed density of lots and ultimately of structures, virtually every large tree within Moon Camp would be subject to future hazard tree removal. These would be hazards that do not exist under current land use and zoning. 41-15
  - The impacts to bald eagles that would be caused by the proposed project could harm bald eagles by removing habitat essential to the feeding and sheltering of this protected 41-16

species, and thereby may constitute "Take" as defined under the federal and state Endangered Species Acts. 41-16

  - While the DEIR concludes that impacts to bald eagles would remain significant with the proposed mitigation, the document understates the level and severity of impacts. 41-17

- The DEIR fails to address impacts to osprey, which frequently perch at Moon Camp in the Spring and Summer, and have similar habitat requirements and sensitivities to those of the bald eagle. 41-18
- Cumulative Effects: The cumulative effects of all of the existing developments, currently approved projects, and proposed developments are significant. It is not possible to mitigate for those significant effects. The cumulative effects analysis in the DEIR is not adequate and does not adequately address the drastic changes that have occurred in the Big Bear Basin especially over the last decade. 41-19
  - With the limited availability of water resources in the San Bernardino Mountains and the high fire risk (even in non-drought years), it would be unconscionable to allow further large-scale development in this area. This project combined with the proposed Marina Point project would at least double the population of the town of Fawnskin. The DEIR describes many significant impacts that would occur—including traffic, water utilization, etc. Those significant impacts cannot be mitigated. It is the County's responsibility and mandate to recognize this significance and determine that it would NOT be good for the communities of the Big Bear Valley. 41-20

When buying property, we researched the current zoning of property around the house and were comfortable with the R-40 zoning of the Moon Camp property. We never would have considered buying property at this Fawnskin location had we known that the Board of Supervisors would consider changing it, thereby adversely affecting our property. If it were this easy to change zoning, the County General Plan would be useless. Please use it as it was meant to be, as a planning document to guide the future of the County and its residents. Please do the right thing and smart thing for the environment, the residents, and visitors by denying this development proposal. 41-21

In closing, the DEIR presents a weak analysis of biological resources which consistently understates the expected level of impacts, and puts forward a set of mitigation measures that would not be effective in substantially reducing highly significant impacts. 41-22

We again urge the County to fulfill its responsibilities to protect the Public Trust and to meet your obligations to protect the quality of the environment. Please select the "No Project" alternative. 41-23

Sincerely,

Robin Eliason

ROBIN ELIASON and SCOTT ELIASON
Residents of Fawnskin and Experts on Biological Resources
1098 Canyon Road

Response to Commentor No. 41
Robert and Scott Eliason
May 14, 2004

41-1 The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-2 The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-3 Commentor refers to adequacy of biological resources surveys in drought years. Please refer to Response to Comment Nos. 3-5 and 13-90, which addresses this concern.

41-4 Please refer to Response to Comment No. 6-1. According to the 2002 Pebble Plain Habitat Management Guide, National Forest land currently supports approximately 3,473 acres of pebble plain habitat and private land supports approximately 736 acres, for an estimated total of approximately 4,209 acres. If the open Jeffrey pine on the project site is determined to be pebble plain during surveys required by Mitigation Measure 5.8-1a and the extent of pebble plain habitat on the project site equates to approximately 17.38 acres, impacts to this acreage would not be expected to substantially reduce the habitat type, threaten to eliminate a plant community, or result in a cumulatively considerable impact to pebble plain habitat. Therefore, impacts to this habitat type associated with the proposed project would not be expected to trigger the Mandatory Findings of Significance for biological resources.

41-5 Commentor refers to specific requirements in the special status plant and vegetation mitigation. Please refer to Response to Comment Nos. 3-5 and 3-6, which addresses this concern.

41-6 Commentor refers to specific requirements in the special status plant and vegetation mitigation. Please refer to Response to Comment Nos. 3-5 and 3-6, which addresses this concern.

41-7 Commentor refers to the applicability of the special status plant and vegetation mitigation. Please refer to Response to Comment Nos. 3-5, 13-86 and 13-95, which addresses this concern.

41-8 Commentor refers to likelihood of finding a property owner to sell land in accordance with the special status plant and vegetation mitigation. Please refer to Response to Comment Nos. 13-92 and 41-4, which address this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-9 Commentor refers to management of conservation lands referenced in the special status plant and habitat mitigation. Please refer to Response to Comment Nos. 3-5 and 13-92, which address this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-10 The Commentor refers to the nature of the special status plant and vegetation mitigation. Please refer to Response to Comment Nos. 3-5 and 13-92, which address this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-11 Please refer to Response to Comment Nos. 41-5 to 41-11. The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-12 Mitigation Measure 5.8-1g has been deleted. Please refer to Response to Comment Nos. 3-5 and 3-6.

Page 5.8-66, Mitigation Measure 5.8-2e of the Draft EIR has been revised in the Final EIR as follows:

5.8-2e	~~Garages with automatic door openers shall be required. No exterior construction shall occur between December 1 and April 1, when bald eagles are present~~. Garages with automatic door openers shall be required. No exterior construction, grading or vegetation clearing shall be permitted between December 1 and April 1, which is the wintering period for bald eagles (i.e., the season when bald eagles are present in the Big Bear area).

41-13 Commentor refers to Mitigation Measure 5.8-1g including requirements for both bald eagle populations and pebble plain habitat. Please refer to Response to Comment No. 41-12, which addresses this concern.

41-14 The impacts to bald eagle are considered significant and unavoidable by the EIR. The EIR does not attempt to quantify the extent to which mitigation measures reduce the levels of impacts; however, the mitigation measures do not reduce the impacts to a level considered less than significant. Removal of trees during clearing for construction would not be conducted while bald eagles are present on the site in accordance with Mitigation Measure 5.8-2e. Therefore, clearing of the trees would not result in a direct impact on bald eagles. However, on page 5.8-51 of the Draft EIR, impacts to bald eagle are addressed and it is indicated that removal of trees or construction of uses in proximity to trees used by the bald eagle such that "a loss of perching or roosting habitat value for wintering bald eagles would be considered a significant impact." This impact is identified as significant and unavoidable in the EIR.

Also, refer to Response to Comment No. 13-88, which addresses cumulative impacts to the bald eagle.

41-15 Commentor refers to impacts to bald eagles. Please refer to Response to Comment No. 41-14, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-16 The term "Take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" under the State and

Federal Endangered Species Acts. Mitigation Measure 5.8-2e (as revised) would insure that no vegetation removal or construction would occur on the project site while bald eagles are present. Removal of unoccupied habitat is not considered "Take" under the Federal and State Endangered Species Acts.

41-17 The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-18 Commentor refers to impacts to Osprey. Please refer to Response to Comment No. 13-87, which addresses this concern.

41-19 Cumulative impacts to biological resources are discussed in Impact Statement 5.6-6 of the Draft EIR. The cumulative impact analysis has been modified to indicate that project implementation would result in significant and unavoidable impacts to the wintering bald eagle population. Please refer to Response to Comment No. 13-88. Also, Response to Comment No. 13-2 addresses the cumulative project analysis throughout the EIR. The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-20 The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-21 The County will consider the Commentor's opinion and comments during their deliberation on the project.

41-22 The County will consider the Commentor's opinion and comments during their deliberation on the project.

MARLA J HENRICH
P.O. BOX 282
FAWNSKIN, CA 92333
Phone 909-866-3300
Fax 909-866-4222
E-mail: marlajean@hotmail.com

Friday, May 14, 2004

Matthew W. Slowik
Land Use Services Department
Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.,GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/rl-40 TO BVRS-7200 AND AMENDMENT TO COUNTY CIRULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE;TENTATIVE TRACT MAP #1636, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Mr. Slowik:

Thank you for the opportunity to review the document and provide comments. I oppose this Moon Camp project as presently designed, because the DEIR fails to adequately evaluate the true impact on the Fawnskin area. The following are examples of my concerns:

Section 5.3. 1 – Fire Protection
The evaluations for this section were based on Fire Risk level 2. This is invalid because all mountain areas in the County have now been upgraded to Fire Risk level 1. 42-1

Nothing was included in the EIR in this Fire Protection section regarding evacuations from the valley in case of wild fire and the impact adding more house would have on that. Since the last evacuation took 6 hours to get off the mountain when we had a few days warning and minimal tourists in the area, **the impact of more houses is VERY SIGNIFICANT.** The "Old Fire" last fall really was a wakeup call. With only 3 exits out of this valley and the possibility that all 3 may not be available for an evacuation is of great concern. It will be several years before we have a healthy forest and the threat of fire is a real danger. 42-2

The mitigations listed on page 5.3.22 for fire protection are completely inadequate. 5.3-1b says fires sprinklers will be added in each residence in lieu of additional manpower. 5.3-1e and 5.3-1f says the fire-resistant vegetation required in the project will be managed and enforced by the Homeowners Association for the project. Who will monitor the Homeowners Association to make certain they are enforcing the rules? These mitigations will have zero impact on improving the situation. We are in a high fire alert area. 42-2

Section 5.7 – Noise

The DEIR Section 5.7 concludes that the short-term (construction), long term, watercraft and cumulative noise would be less that significant. This is not the case. As of this time, highway noise can be heard in Fawnskin. The Marina Point project, the moving of the Moonridge Zoo to the North Shore, and this project would certainly increase the highway usage and create more noise. This project also includes a marina. This would impact the highway use noise as well the noise level from boat engines, people's voices, etc. The general noise associated with a marina would definitely impact the noise level in our homes. **The homes and marina in the Moon Camp proposal along with the proposed Marina Point development (which also includes a proposed marina) would have a significant negative impact in regards to the noise level in this area.** 42-3

Thank you for the opportunity to respond to the Draft EIR.

Sincerely,

Marla J Henrich

Marla J. Henrich

cc: Supervisor Dennis Hansberger
Congressman Jerry Lewis
Senator Jim Brulte
Assemblyman Russ Bogh
Senator Nell Soto

Response to Commentor No. 42
Marla J. Henrich
May 12, 2004

42-1 Commentor refers to the current accuracy of the Fire Risk Level designation. Please refer to Response to Comment No. 13-27, which addresses this concern.

42-2 Commentor refers to traffic impacts and affects to evacuation plans, as well as completeness of fire protection services mitigation measures. Please refer to Response to Comment Nos. 4-1, 4-4, and 13-27 to 13-34, which address these concerns.

42-3 Commentor refers to the short- and long-term cumulative noise impacts associated with proposed project and the adjacent Marina Point development. Please refer to Response to Comment Nos. 13-80, 13-83, 26-15 and 28-2, which address these concerns. The County will consider the Commentor's opinion and comments during their deliberation on the project.

May 14, 2004

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DIVISION

County of San Bernardino, Land Use Services Department
Planning Division
385 N. Arrowhead Ave-First Floor
San Bernardino, CA 92415-0182

Attn: Matthew W. Slowik

Re:" DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.:GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK."

Dear Mr. Slowik,

We appreciate the opportunity to review this document. We are opposed to the Moon Camp project as presently designed because the DEIR has failed to evaluate adequately the true impact the project would cause for the home owners of Fawnskin. Although there are many issues we are in opposition, we will only list a few.

WATER- 5.3.6
It is stated that the proposed changes will not have an adverse effect on our community- In reality, the impact will be significant. Our lake is extremely low, we already have a water shortage. We face constant fire danger and the lack of water to fight it. Water measurement was done in 1987- DEIR does not evaluate the water supply in draught conditions. The water supply must be proven prior to changing zoning before allowing more than one house per 40 acres. We are already on odd/even watering days for the existing houses and these restrictions do not work. **43-1**

FIRE PROTECTION – 5.3.1
Last evacuation, it took over 6 hours to get Big Bear residents off the mountain. This was not a weekend or holiday which would have had a serious impact on the safety of the residents, tourists. The Discovery center is now being expanded which will bring up more tourists and create more congestion. The fire department already has limited access to some of the areas and increased population due to the new proposed projects is going to be a real disaster. **43-2**

ELECTRICITY-5.3.9
We will be receiving higher electricity rates due to the new generator Bear Valley Electric is building and it is designed to handle peak period overloads for the current residents and businesses. No more electricity can be brought up the mountain and we are already facing shortages. A power source on the proposed project would create additional pollution, additional noise, and a threat to wildlife. **43-3**

NOISE-5.7
We already have a significant rise in noise through Fawnskin . We hear every car that passes and the proposed new construction has plans to move the highway closer to the homes creating increased noise, and pollution. The new project also plans to add nearly 100 boat slips which will increase the noise level to Fawnskin homeowners. We already hear every boat on the lake and we believe that many will decide to leave because our peace and tranquility will be destroyed. We live in Fawnskin because it is quiet, peaceful and this new proposed project is taking away everything we came here to enjoy. **43-4**

Thank you for allowing us to express our feelings.

Dr. Gerald and Natalie Marks
39739 Flicker Road
Fawnskin,CA 92333/0229

Response to Commentor No. 43
Dr. Gerald and Natalie Marks
May 14, 2004

43-1 Commentor refers to water supply and affects to groundwater. Please refer to Response to Comment Nos. 1-3 to 1-6, 13-42, 13-43, 13-44, 13-47, 18-1 and 21-3, which address these concerns.

43-2 Commentor refers to increased traffic and affects to evacuation plans. Please refer to Response to Comment No. 13-32, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

43-3 Commentor refers to the potential impacts as a result of constructing an alternative electrical power source on the project site. Please refer to Response to Comment Nos. 13-49, which addresses these concerns. The County will consider the Commentor's opinion and comments during their deliberation on the project.

43-4 Commentor refers to long-term noise impacts associated with project implementation. Please refer to Response to Comment Nos. 13-80, 13-83, 26-15 and 28-2, which address this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

May 15, 2004

Mr. Matthew W. Slowik
County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

RE: DRAFT EIR for the Moon Camp Development Project/RCK Properties Inc.: General Plan Amendment/Official Land Use District Change; Tentative Tract Map #16136, & conditional use permit for a boat dock.

Dear Mr. Slowik,

Thank you for allowing us to review the above referenced document. We believe that the resulting impacts of this proposed project would be very significant. Namely:

1) **Zoning change:** In section 5.1-2, San Bernardino County Development Code, the DEIR states that according to the General Plan, a Land Use District Change requires that each of the following statements be true:
   a. "The proposed land use District change is in the public interest, there will be a community benefit, and other existing and permitted uses will not be compromised." This is not true! 44-1
   b. "The proposed land use District change is consistent with the goals and policies of the General Plan, and will provide a reasonable and logical extension of the existing land use pattern in the surrounding area." This parcel has been one for one single family residence for years, and serves as a buffer between existing single family residences and the National Forest and the lake. 44-2
   c. "The proposed land use District change does not conflict with provisions of this Code, or any applicable specific code." This is doubtful, when one reads the first 100+ pages of the DEIR, statement after statement is made as to the negative impacts. 44-3
   d. "The proposed land use District change will not have a substantial adverse effect on surrounding property." It would have significant impacts in terms of traffic, air and noise pollution. 44-4

2) **Cumulative Impact:** In section 5.1-3 of the DEIR it states that combined with other future development, the proposed project would increase the intensity of land uses in the area. The cumulative effects of this proposed project, plus the proposed Marina Point development, plus the proposed Brookside project, plus the expansion of the Discovery Center to handle more visitors, plus all the developments on the south shore, given the water shortage, electricity shortage, fire danger, lack of evacuation abilities, all go together to create an 44-5

extremely significant impact. It is invalid, misleading, and understated to analyze this project alone. 44-5

3) **Recreation:** In section 5.2-1, the DEIR states that the proposed construction of marina facilities may have an adverse impact on the physical environment. 44-6

4) **Fire Protection:** All the evaluations in Section 5.3-1 were based on Fire Risk level 2, but all mountain areas in the County have now been upgraded to Fire Risk level 1, so all the comments here are invalid. Nothing was addressed in the document about evacuations from the valley, and how additional homes and residents will impact the already difficult evacuation plans. It would have a *significant impact!* The mitigations listed on page 5.3-22 for fire protection are completely inadequate. Our valley has unprecedented building, with a higher wildfire risk than anywhere else in the country, and questionable ability to evacuate the people who already live here. The view that the South shore residents and visitors enjoy would be irreparable damaged if two massive projects replace trees with walls, windows and marinas, as well as increasing boat and car traffic! 44-7

The Old Fire demonstrated that we can't defend what already exists in the mountains. Denial and complacency of the mountain fire danger has already placed too many people in jeopardy. Disasters will only get worse, if we ignore the lessons of the Old Fire and lapse again into forgetfulness and denial, further underestimating this dire problem. 44-8

Anyone who was in the Big Bear evacuation knows that it is highly irresponsible to add more people to these dangerous mountains. There comes a time when public safety and taxpayer protection must override high zoning densities and excessive profiteering on private lands in the mountains. The Old Fire indicates we've reached that point. 44-9

5) **Police Protection:** The DEIR says in section 5.3-2 that the project implementation could result in significant physical impacts but has concluded these would be less than significant. Additional rental properties would only increase the already significant problem that exists with owners not being held accountable for following rules, and the rules not being enforced. Fawnskin residents have had problems with slow response times and adding more residents would only add to the problem. 44-10

We, as residents of Fawnskin, respectfully request that you look at these and other significant impacts that this proposed project would have. Residents and visitors to Fawnskin are here precisely BECAUSE of the peaceful, quiet nature of the area. They are here because it IS mostly forest service land, because it IS NOT like the South shore. Let's not let yet another developer try to change the zoning in order to build more homes that are not needed or wanted.

Very truly yours,

William Hazewinkel
Nancy Walker
PO Box 378, Fawnskin, CA 92333

Response to Commentor No. 44
William Hazewinkel and Nancy Walker
May 15, 2004

44-1 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-9, which addresses this concern.

44-2 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-10, which addresses this concern.

44-3 The County will consider the Commentor's opinion and comments during their deliberation on the project.

44-4 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-16, which addresses this concern.

44-5 Commentor refers to cumulative impacts associated with other foreseeable projects. Please refer to Response to Comment No. 13-2, which addresses this concern.

44-6 Commentor refers to the proposed marina facility and potential impacts to the environment from recreational facilities. Please refer to Response to Comment No. 13-24, which addresses this concern.

44-7 Commentor refers to impacts to fire protections services as a result of project implementation. Please refer to Response to Comment Nos. 4-1, 4-4, and 13-27 to 13-34, which address these concerns. The County will consider the Commentor's opinion and comments during their deliberation on the project.

44-8 The County will consider the Commentor's opinion and comments during their deliberation on the project.

44-9 Commentor refers to traffic impacts and affects to evacuation plans. Please refer to Response to Comment No. 13-32, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

44-10 Commentor refers to current police protection services and the Project's impact to police services. Please refer to Response to Comment Nos. 13-38 to 13-40, which address these concerns.

May 15, 2004

County of San Bernardino
Land Use Services Department
Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

Attn: Matthew W Slowik

Subject: Draft EIR for the Moon Camp Development Project/RCK Properties, Inc.: General Plan Amendment/Official Lane Use District change from BV/RL-40 to BV/RS-7200 and amendment to county circulation element for realignment of North Shore Drive; Tentative tract map #16136, and conditional use permit for a boat dock.

Thank you for the opportunity to review this document and give my thoughts on the problems that I see would be a result of this development. I oppose the Moon Camp project as presently designed because the DEIR fails to adequately evaluate the true impact this proposed project would cause to the critical issues of water and biological resources.

Water:

1. The DEIR in Section 5.3-6 states that this project is exempt from SB221 (which states adequacy of water supplies for the proposed project must be determined). It also says that SB221 applies to any subdivision that increases connections by 10% or more, if the water service has few than 5,000 connections. The Fawnskin water service is completely separate from the system that serves the rest of the Valley. Since there are currently 673 connections in Fawnskin, 92 additional connections is a 14% increase, so this law applies. 45-1
2. The DEIR in Section 5.3-6 bases potential water supply on two wells on the property drilled in 1987. It does not evaluate the well production based on extensive drought conditions much different from when the productions were measured in 1987. 45-2
3. Mitigation number 5.3-6 a, states that water supply has to be proven prior to building permits. Given the current drought conditions, the rate increases and water restrictions already in place, the water supply must be proven prior to changing the zoning to allow more than 1 house per 40 acres. 45-3
4. Mitigation number 5.3-6d states that all the current water restrictions for outdoor watering will continue, such as limited hours every other day, no run-off, etc. These restrictions already do not work effectively for the existing house, and pretending this mitigation would have any effect is completely misleading. 45-4

5. Section 5.3-6 states that the groundwater basin is already in overdraft conditions, but the overall analysis grossly understates the problem and current water shortages. 45-5

Biological

1. Loss of trees was not considered as part of the biological resources evaluation (section 5.8). 45-6
2. While a mitigation for eagles states that all trees over 20 inches in diameter will be protected, it does that only on the individual lots and does not hold the developer to that standard for cutting roads and other structural changes required for the proposed project. Therefore, the analysis is misleading in pretending that this mitigation will actually protect the eagle perch trees. 45-7
3. The analysis does not include ospreys, common visitors to the site. 45-8

Thank you for your attention to these items. I respectfully request that the Moon Camp project not be approved in its current form.

Sincerely,

Beverly Ornelas
Fawnskin Property Owner
1076 Fawnskin Drive
Fawnskin, CA 92333

Response to Commentor No. 45
Beverly Ornelas
May 15, 2004

45-1 Commentor refers to the applicability of SB 221. Please refer to Response to Comment No. 13-42, which addresses this concern.

45-2 Commentor refers the historical well data utilized in the analysis of groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5 and 13-98, which address this concern.

45-3 The County will consider the Commentor's opinion and comments during their deliberation on the project.

45-4 Commentor refers to existing and proposed water conservation measures in place and their effectiveness. Please refer to Response to Comment No. 13-47, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

45-5 Commentor refers to water supply and the affects to groundwater supply. Please refer to Response to Comment No. 1-5, which addresses this concern.

45-6 Commentor refers to the loss of trees and the affects to biological resources. Please refer to Response to Comment No. 13-86, which addresses this concern.

45-7 Commentor refers to impacts to bald eagles. Please refer to Response to Comment Nos. 3-7, 13-86, 13-88, 13-95 and 41-14, which address this concern.

45-8 Commentor refers to impacts to osprey. Please refer to Response to Comment No. 13-87, which addresses this concern.

Sandy Steers
P.O. Box 423
Fawnskin, CA 92333
(909) 878-3091

May 16, 2004

HAND DELIVERED

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Avenue 1st Floor
San Bernardino, California 92415-0182

Attn: Matthew Slowik, Sr. Assoc. Planner

RE: "DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK."

Dear Mr. Slowik,

Thank you for this opportunity to comment on the Draft Environmental Impact Report for the proposed Moon Camp residential development project, General Plan amendment, land use district change, circulation amendment, tentative tract map and conditional use permit for a boat dock (collectively DEIR). As a resident and homeowner in Fawnskin, California, I am strongly opposed to this proposed project. This Moon Camp project, as proposed, is completely contrary to the County's obligation to safeguard the public interests. Changing the zoning to allow for more dense housing in the midst of an emergency crisis in the mountains, and thereby increasing the public safety risks and public health risks, would be irresponsible on the part of the County. 46-1

This DEIR omits much essential information and analyses and downplays the extent and the significance of the impacts that would be caused by the development of this proposed project. Most importantly, it completely ignores how extensively the proposed zoning change goes against the County's General Plan ordinances, it downplays and misstates the importance of the current water shortage in the mountains and the lack of a proven water supply for this proposed project, and it fails to mention the key issue of fire evacuations from the 46-2

mountains in a time when the mountain communities have been declared by both the State and the County to be in a State of Emergency. 46-2

- There is nothing in the DEIR, not even in the Fire Protection analysis, Section 5.3, that discusses or analyzes the effect this proposed project would have on the already controversial and questionable ability to safely evacuate all residents and visitors from the mountains. With two days notice and a fire still a few miles from the Big Bear Valley, it took over 6 hours to get off the mountain during the October evacuations. The DEIR must include an evaluation of the impact on evacuations for similar circumstances, as well as for the possibility of a fire starting near Fawnskin. 46-3
- The DEIR states in Section 5.1-2 that according to the General Plan, a Land Use District Change requires that four statement be true – basically, that it is in the public interest and to the community benefit, that it does not conflict with any County codes, that it does not have an adverse effect on surrounding properties and that it provides a logical extension of the surrounding properties. As described in detail in the response letter to the County from the Friends of Fawnskin, **this zoning change does not meet even one of those requirements!** And yet, this DEIR concludes that the impact of this zoning change would be less than significant. 46-4
- The DEIR, in Section 5.3-6, seriously downplays the importance of the current water crisis in the Big Bear Valley and fails to mention that the area is currently on Stage 2 water restriction, with Stage 3 a possibility by the end of summer. The DEIR does not fully address nor adequately analyze the impacts this proposed project would have on this issue that is critical to the health and well-being of the entire Valley population. (again, reference the response letter from Friends of Fawnskin.) 46-5

In summary, this DEIR is incomplete and inaccurate and must be rejected. The many significant impacts are downplayed, sugar-coated or completely ignored. This proposed project, as presented, is totally contrary to the guidelines set forth in the County's General Plan and totally contrary to the best interest of the community. It threatens to further endanger the public safely and public health and warrants a denial. I strongly urge the County to select the No Project Alternative.

Sincerely,

Sandy Steers

Sandy Steers
Fawnskin resident and homeowner

Response to Commentor No. 46
Sandy Steers
May 16, 2004

46-1 The County will consider the Commentor's opinion and comments during their deliberation on the project.

46-2 The Draft EIR includes a comprehensive analysis for each subject area and fully complies with the requirements of CEQA, including Sections 15120 to 15132 of the CEQA Guidelines, which outline the "Contents of and Environmental Impact Report." The Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment Nos. 13-9 to 13-20, which address this concern. Also, the Commentor refers to the Project's potential to impact evacuation plans. Please refer to Response to Comment No. 13-32, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

46-3 Commentor refers to traffic impacts and affects to evacuation plans. Please refer to Response to Comment No. 13-32, which addresses this concern.

46-4 The Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment Nos. 13-9 to 13-16, and 13-20, which address this concern.

46-5 Commentor refers to water supply and the impacts to groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5 and 13-47, which address this concern.

R. Lee Whitney
Marilyn Whitney
P.O. Box 37
Fawnskin, CA 92333
(909) 866-3818

May 16, 2004

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182
Attn: Matthew W. Slowik

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTRY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Mr. Slowik:

We appreciate the opportunity to review this document. We oppose this Moon Camp project as presently proposed because the DEIR fails to adequately address the total impact of the zoning change.

Section 5.1-2 of the DEIR states that the proposed project "conflicts with the land use plan, policies and regulations of the San Bernardino County Development Code." Their highly subjective analysis concludes that the proposed project would have an insignificant impact on the General Plan Land Use policies. We strongly disagree with these assumptions. 47-1

In section 5.1-2, San Bernardino County Development Code, the DEIR states that according to the General Plan, a Land Use District Change requires that each of the following statements be true:

1. The proposed land use District change is in the public interest, there will be a community benefit, and other existing and permitted uses will not be comprised.
2. The proposed land use District change is consistent ...
3. The proposed land use District change does not conflict .....
4. The proposed land use District change will not have a substantial adverse effect on the surrounding property.

Item #1 is not true because the proposed project is not in the public interest of the residents of Fawnskin, and would not be a benefit to the existing community. The existing infrastructure cannot support the current population. Changing demographics, without any zone changes, will increase full-time occupancy rates because of the substantial increase in retirees in the next twenty years. 47-2

- Roads – All of the DEIR analyses are based on "average" traffic volumes. We have experienced peak volumes (evacuation for fire in October 2003) and the roads were jammed. It took seven hours to evacuate in "bumper-to-bumper" traffic conditions on a weekday. On summer weekends, Stanfield Cutoff has extremely long lines waiting to turn onto Big Bear Blvd. Adding additional housing units will only increase this problem. 47-3
- Water – We are currently experiencing a drought condition that has been going on for five to six years. Experts question whether the past 100 wet years might have been an anomaly, and that the coming years might continue to be much drier. If this dry condition continues, we believe that it is reckless to change zoning to provide for any additional residential units. The DEIR in Section 5.3-6 states, "Based upon the inability for providers to confirm services, coupled with potentially significant overdraft conditions cited in Section 5.11 of the EIR, impacts are concluded to be significant 47-4

and adverse." Given the current drought conditions, the rate increases, water restrictions for outdoor watering for existing houses, we believe that zoning must not be changed to allow more than 1 house per 40 acres. 47-4

Item #4 is not true because the proposed project will have a substantial adverse effect on surrounding property. 47-5

- Fire Protection – Section 5.3-1 of the DEIR based their analysis on Fire Risk level 2. All mountain areas in the County have been declared Fire Risk level 1. A new analysis is needed to address this situation.
- Aesthetics of the existing Scenic Byway - State Route 38 that runs through the proposed project is designated as a "Scenic Highway" by the County and as a "Scenic Byway" by the United States Federal Government. We, as residents of Fawnskin, are particularly appreciative of the natural beauty of that Highway. The proposed project would completely alter the natural setting/character and forever change scenic nature of the area. Simulated views shown in the DEIR (Section 5.4) are over-simplified in that they do not show potential effects of the new homeowner's probable tree plantings. From our experience, new trees will become a larger problem in changing/destroying lake views. Homeowners typically plant trees that will grow fast, like Poplars, Maples, and Flowering Crabapples (none native to the San Bernardino Mountains) that quickly grow and block views. Therefore the simulated highway views are likely to become nonexistent. (These trees will also contribute to the water shortage problem.) 47-6

Thank you for your consideration in this matter. We have been residents of Fawnskin for almost twenty-five years and believe that the proposed project would adversely affect our community.

Sincerely,

Lee Whitney
Marilyn Whitney

Response to Commentor No. 47
Lee and Marilyn Whitney
May 16, 2004

47-1 The Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment Nos. 13-9 to 13-16, which address this concern.

47-2 The Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-9, which addresses this concern.

47-3 Section 5.5, *Traffic and Circulation*, presents data regarding average and peak month traffic volumes on the Existing Conditions section. However, the traffic analysis and identified impacts were analyzed for peak month traffic volumes, not average month traffic volumes. Also, refer to Response to Comment No. 13-32.

47-4 The County will consider the Commentor's opinion and comments during their deliberation on the project.

47-5 The Commentor refers to the Project's consistency with the County's General Plan due to the current Fire Risk Level designation. Please refer to Response to Comment No. 13-27, which addresses this concern.

47-6 Commentor refers to the visual simulations not being reflective of build-out of the project area. Please refer to Response to Comment Nos. 13-54 and 13-55, which address this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

COMMENT NO. 48

May 17, 2004

Mr. Matthew W. Slowik
County of San Bernardino Land Use Services Department, Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

RE: DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES, INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK.

Dear Mr. Slowik,

We are writing to request that the County extend the May 17, 2004 deadline for the public responses to the DEIR for the Moon Camp Development Project. We feel that six weeks is an unreasonably short amount of time to evaluate a document, which took RBF consulting two years to complete. The DEIR is a huge, complex document, which refers to other reports, and documents that are not included. We find that we require more time to review the existing information and locate and research the referred documents. 48-1

We appreciate your consideration in this request. We may be reached at 909-866-2839. We look forward to your response.

Sincerely,

Thomas and Kimberly Brickley
39745 Flicker Road
P.O. Box 88
Fawnskin, CA 92333

Response to Commentor No. 48
Thomas and Kimberly Brickley
May 17, 2004

48-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

Memorandum to Matthew Slowik

From Roman Silberfeld

Re - Draft EIR for Moon Camp Development Project

May 17, 2004

Although I wrote to you last week and requested an extension of time within which to respond to the draft EIR, I have not heard from you and therefore I submit this brief memorandum as my comments in opposition to the draft EIR. I hope that you will nevertheless grant my request for a 90 day extension of time within which to provide more fullsome comments on the draft EIR. 49-1

The draft EIR is defective in that it fails to adequately take into account, measure and evaluate the following:

> the cumulative impact of this project, if approved, on the entire valley and other projects, some of which have been approved and others of which are in various stages of development; 49-2

> the recreational impacts are simply wrong in that public access to the public lake would be extremely limited by the project in that access to the lake shore would be completely different than that stated in the draft EIR; 49-3

> fire protection would be compromised and existing precious resources would be stretched beyond the breaking point; 49-4

> police protection would likewise be negatively impacted as there is already an insufficient police presence on the north shore; 49-5

> we are in the 6th year of a drought and severe water use restrictions are currently in force and these restrictions may be expanded; 49-6

> traffic congestion and hazardous roadways are likely created by the impacts of new vehicles in large numbers and the change in the configuration of the roadway; 49-7

> air quality, light, noise and congestion are a certainty if the population of the area is substantially increased as proposed; 49-8

> *biological and protected species impacts have not received adequate study.* | 49-9

Please grant the request for additional time requested last week.

Please also continue to provide me with notice of any action on this project.

My mailing address, fax and phone are:

Roman Silberfeld
2049 Century Park East, Suite 3700
Los Angeles, Ca. 90067

Phone - 310 552 0130
Fax - 310 229 5865

Response to Commentor No. 49
Roman Silberfeld
May 17, 2004

49-1 Commentor refers to extending the deadline for providing comments on the Draft EIR. Please refer to Response to Comment No. 9-1, which addresses this concern.

49-2 Commentor refers to cumulative impacts associated with other foreseeable projects. Please refer to Response to Comment No. 13-2, which addresses this concern.

49-3 Commentor refers to decreased public access to the lakeshore. Please refer to Response to Comment No. 13-26, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

49-4 The County will consider the Commentor's opinion and comments during their deliberation on the project.

49-5 Commentor refers to current police protection services and the Project's impact to police services. Please refer to Response to Comment Nos. 13-38 to 13-40, which address this concern.

49-6 Commentor refers to the expansion of existing and proposed water conservation measures. Please refer to Response to Comment No. 13-47, which addresses this concern. The County will consider the Commentor's opinion and comments during their deliberation on the project.

49-7 Commentor refers to increased traffic and safety hazards associated with the proposed highway realignment. Please refer to Response to Comment No. 13-65, which addresses the safety hazards. The County will consider the Commentor's opinion and comments during their deliberation on the project.

49-8 The County will consider the Commentor's opinion and comments during their deliberation on the project.

49-9 The County will consider the Commentor's opinion and comments during their deliberation on the project.

COMMENT NO. 50

965 Deer Trail
Fawnskin, California 92333

May 17, 2004

VIA FACSIMILE (909) 387-3223

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Avenue 1st Floor
San Bernardino, California 92415-0182

Attn: Matthew Slowik, Sr. Assoc. Planner

RE: "DRAFT EIR FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK."

I. INTRODUCTION AND SUMMARY

We thank the San Bernardino County Land Use Services Department Planning Division for the opportunity to comment on the Draft Environmental Impact Report (DEIR) for the proposed Moon Camp residential development project. We understand the project includes a proposed General Plan amendment, land use district change, circulation amendment, tentative tract map and conditional use permit for a boat dock. We own property which would be directly affected by the development of the proposed Moon Camp project. Residents and visitors who have chosen to come to Fawnskin have done so primarily because of the current character of the town. We feel that it is imperative to the rights of these individuals and to the well-being of the entire Big Bear Valley that the basic essence of this character be preserved.

This project, as proposed, would have extensive adverse effects on surrounding properties, on the entire community of Fawnskin and on the Big Bear Valley as a whole. Many of these significant impacts and multiple harmful effects that would occur should this proposed project be approved are not even proposed for avoidance or mitigation.

We find the DEIR to be incomplete, inaccurate, and defective. The DEIR fails to evaluate adequately the severe adverse effects of the proposed project and grossly downplays and understates the significant and unavoidable impacts that would be caused should it be approved. The misstatements and omissions are so pervasive as to suggest they are deliberate, requiring rejection of the DEIR. Please include this letter in its entirety as part of your formal record of comments to be included in the Environmental Impact Report.

II. GENERAL PROCEDURAL COMMENTS

The DEIR "Cumulative Analysis" in all areas fails to adequately assess the cumulative effect of both the subject project and other proposed projects. It uses Valley-wide data which distorts the impact of the project, but then conveniently omits consideration of two large projects—the Castle Glen development in Big Bear Lake and the tripling in size of the Big Bear Discovery Center to accommodate increased tourist traffic—that add to the already significant cumulative impacts of this proposed project on Fawnskin, the North Shore and the Big Bear Valley. In addition, two other parcels (one 30 acres and one 7.5 acres) very near the Moon Camp property are in various stages of proposed development. The cumulative impact of all the

50-1

combined projects is either ignored or underestimated and downplayed throughout every section of the document. 50-1

The DEIR does not point out that the project is likely to comprise second homes. This exacerbates traffic, noise and lake congestion issues because it concentrates use in summer, especially on weekends and holidays. It also renders proposed mitigation measures such as homeowner association procedures less effective. Homeowner associations comprised of part-time residents are less likely to be able to enforce rules about runoff, water use, outdoor fires, lighting, trash, etc. And vacation home renters are not likely even to know of such measures. This renders many proposed "mitigation" measures illusory and ineffective. Practical, realizable mitigation should occur, or else the DEIR should concede the adverse impacts are unavoidable. 50-2

The DEIR fails to address the current 6-year drought. There is still no defined water supply for the site and as such, according to current state law, this proposed project absolutely cannot be approved. The DEIR uses data almost 20 years old, which has not been brought current. 50-3

The DEIR in all sections fails to state how each mitigation item will be implemented and who will mitigate the impact. 50-4

The DEIR analysis failed to consider input from: 50-5

- California Department of Transportation (necessary to give input to the rerouting of the scenic highway)

- the United States Forest Service (the proposed development is adjacent on the north and east to the USFS which has needs to address eagle and biological concerns)
- the California Department of Fish and Game (input necessary for shoreline fish habitat). 50-5
- the Army Corps of Engineers (input necessary for dredging to deepen a site for boat docks).
- and the Big Bear Lake Municipal Water District (input necessary for dredging and the marina).

Consideration of air quality impact has been minimal.

The DEIR fails to consider the "No Project/No Development" and the "No Project/ Existing Designation" Alternatives as viable alternatives in Section 7.5 and fails to state specifically which is the "Environmentally Superior" option. 50-6

III. LAND USE AND RELEVANT PLANNING

The DEIR concedes the Project violates development codes and rules (see pages 2-2 and 2-3). Perhaps using this as a basis, in Section 5.1.1 of the DEIR fails to reference or consult the study mandated in General Plan Ordinance OR-3-d. "Prepare a report outlining the economic effects of open space, focusing on potential tourism revenues, the effect of open space on adjacent property values and the relative costs of providing open space management or urban services for a site." Since this property is now open space and since the current zoning serves to leave it in primarily an open space state, this study must be included. 50-7

According to the General Plan, a Land Use District Change requires that: "The proposed land use District change is in the public interest, there will be a community benefit, and other 50-8

existing and permitted use will not be compromised." The existing use of a large portion of open space, consistent with the current zoning would be compromised with the proposed zoning change. The proposed change would also obstruct public lake views from the highway in one of the few places remaining where the public can view the lake from the highway. 50-8

This proposed zoning change conflicts with the County's General Plan Code C-56 "Restrict development along scenic corridors." This proposed change would serve to increase rather than restrict development along a designated scenic highway. In fact it would destroy a scenic corridor and replace it with a project wall. This proposed zoning change conflicts with the County's General Plan Code C-55 "Preserve and protect outstanding scenic resources of San Bernardino County for their continued future enjoyment." This proposed change would serve to degrade, not protect the outstanding scenic resources of this area.

The County's General Plan Code OR-59 states that "Because public health and safety can be protected through the use of open space, the County may maintain open space where flood, *fire*, geologic, seismic hazards, noise or other conditions endanger public health and safety." This proposed change poses a substantial risk to the protection of the public's health and safety and points out the county's duty not to increase fire risk. 50-9

This proposed zoning change conflicts with the County's General Plan Code in Section III C, Mountain Region, "The physical/natural constraints of the region and the lack of adequate water supply and infrastructure facilities needed to support higher density development preclude higher intensity uses." (emphasis added). Since the General Plan saw fit to zone this property 50-10

RL-40 to **preclude** higher density uses, this proposed change is in direct conflict. The DEIR does not explain or justify ignoring the "physical/natural constraint's and the lack of an adequate water supply and infrastructure." 50-10

The proposed project does not satisfy any of the requirements stated in the General Plan for allowing a zoning change. Therefore, the DEIR statements are false and the DEIR failed to adequately assess the collective or combined effect of both the project in question and other foreseeable projects. See Kings County Farm Bureau v. City of Hanford, 221 Cal.App. 3d 692. 50-11

The DEIR states in Section 5.1-3 that this proposed project, combined with other future development, would increase the intensity of land uses in the area, but, without explanation concludes that the impacts are less than significant. This is an inaccurate and defective conclusion. The cumulative effects of this proposed zoning change in total with the proposed Marina Point development project, the proposed Brookside development project, the expansion of the Discovery Center and the other projects currently in development in Big Bear Valley create a significant and unavoidable impact to Fawnskin and the surrounding communities. In particular: 50-12

- The proposed zoning change would have the potential to increase the size of Fawnskin by at least 34%. Such a substantial increase in the size of a community has a multitude of adverse impacts on the infrastructure and the character of the area and would be a significant and unavoidable impact. 50-13
- The San Bernardino County Land Use Element policy, which the DEIR states is "relevant to the proposed Project," states that "new residential development [must] ensure compatibility with adjacent land uses and community character." The proposed project is designed as a suburban residential tract with cul-de-sacs, street lighting, curbs, etc, which in no way matches the unique, rural surrounding 50-14

community. The DEIR incorrectly states that the surrounding residential property is Improvement Level-1 (high density development in urban areas), but the surrounding properties in reality have Improvement Level-3 – there are no curbs and gutters, there are no sidewalks, there is no street lighting at all the intersections. 50-14

- Considering that State Route 38 is a County designated Scenic Highway and that the views from this Scenic Highway would be completely lost and replaced with a view of the wall of a gated community, stating impacts are not significant is invalid. 50-15

IV. RECREATION

Section 5.2-1, Expansion and/or construction of Recreational Facilities, of the DEIR states on page 5.2-4 that the proposed construction of marina facilities may have an adverse impact on the physical environment, but that these potential impacts are less than significant. This analysis is invalid and the impacts have been significantly understated.

- Construction of these facilities would require dredging of the lake in shallow-water eagle foraging habitat. No analysis has been done on storage of boats during the seven months of the year when they are not in use. Use of these facilities with residents pulling boats and trailers in and out of the facility has not been accounted for in the traffic study. 50-16

- The use and misuse of fuel has not been considered in either the fire safety discussions or water quality discussions. 50-17

- The DEIR bases all calculations on a weekend use factor of 9%, which is the yearly average. This use is actually seasonal and is closer to 60% during summer weekends, with 90% expected on holiday weekends. As a result, the impact these proposed facilities would have has been underestimated, making the analysis invalid. It should be redone focusing on weekend and summer impact. 50-18

- The DEIR statement that "Public access to the lakeshore would be maintained at the eastern and western boundaries of the site" is invalid. 50-19

- The proposed project maps and plans show no public access corridors designated. The lakefront portion of the proposed project would abut to existing homes on the east and to the proposed Marina Point development project on the west. 50-20

- All land below the high water line of Big Bear Lake is open to the public but the proposed plan affectively precudes access. 50-21

V. PUBLIC SERVICES AND UTILITIES

A. Fire Protection. Section 5.3 under Fire Protection does all of its analysis based on Fire Risk level 2, but all mountain areas in the County have been upgraded to Fire Risk level 1. This makes the DEIR's entire analysis of Fire Protection invalid. 50-22

Discussion of fire flow requirements is invalid without discussion of where this water capacity will come from. Further, the DEIR findings are not reflections of any comment from County Fire. 50-23

The DEIR in no way links the fire sprinklers it describes to the real hazard. Especially in cases of forest fires, internal sprinklers do nothing to stop the trees and brush around the homes from burning and spreading the fires. This alleged mitigation completely ignores the issue of fire risk in the mountains. 50-24

The DEIR fails to consider increased fire risk from marina operation and on-site boat storage. 50-25

The mitigations listed for fire risk are based on homeowners complying with HOA standards and offer no plan for enforcement. This is completely impractical, especially in a transient community and the mitigations are therefore illusionary. 50-26

The DEIR does not address Fire Evacuation plans for the area, so nothing was included regarding the cumulative impact more houses will have on fire evacuations from the valley. In 50-27

the October 2003 wildfire evacuation, with a few days of warning and with minimal tourists in the area, it still took 6 hours to get off the mountain. No analysis was done on the impact increasing the size and population of Fawnskin by 34% will have on fire evacuations. No analysis was done for peek weekend usage, locals on of the risk one or more existing evacuation routes will be blocked. 50-27

No analysis was done on the how the additional homes of the proposed development would increase the urban/forest interface percentage in Fawnskin and how much the fire risk will increase accordingly. Homes involve furnaces, fireplaces, barbecues, gas tanks for boats, and other sources of both fuel and ignition. 50-28

The Insurance Service Organization (ISO) has stated that Fawnskin is in a high fire danger area (9 on a 1-10 basis). The EIR does not evaluate whether adding additional homes will increase the likelihood of fire insurance becoming unavailable for the Fawnskin residents and especially for second homeowners who already have a challenge in obtaining fire coverage. 50-29

For the reasons given above, among others, the DEIR is incomplete, inaccurate, and defective in its analysis of fire protection and the development of the proposed project.

B. Police Protection. Section 5.3-2 using the average response time for emergency calls to the entire unincorporated area is invalid – only average times to the Fawnskin area should be used due to its distance from the Sheriff's station compared with other unincorporated areas. The DEIR does not mention that there is currently one officer for the entire area and police services are spotty at best and non-existent at worst. 50-30

No analysis was done in the DEIR on police response times and abilities for "other than emergency" calls. The one source cited, a letter written in 2002, lists no meaningful data. More data should be requested. 50-31

C. Water. The DEIR states that the water issue cannot be mitigated to below the level of significance. Even so, the analysis that is offered grossly understates the current water crisis. 50-32

This proposed project is not exempt from SB221 (which applies to any subdivision (with fewer than 5,000 connections) that increases connections by 10% or more.) Since Fawnskin is actually a separate system and independent from the rest of the DWP's service area and the rest of the Valley it must be considered separately in the calculations. There are currently 673 connections in Fawnskin, 92 additional connections would be a 14% increase, so SB221 does apply. 50-33

The DEIR does not address the fact that water use restrictions are an effort (and have been for several years). It does not focus on the impact on existing wells or disclose any projections if long-term drought continues. The DEIR projects a potential water supply on 2 wells drilled on the property in 1987. Any assumption for potential water supply from these wells is inaccurate without further study of current conditions. According to the Big Bear Lake Municipal Water District's Watermaster report (which was not utilized as reference material in the DEIR analysis) the average rainfall over the past 5 years compared to the 5 years prior to 1987 was 37% at the dam and 51% less at the Big Bear Lake Fire Department. Without the 50-34

presentation of this information and an associated analysis, the DEIR is incomplete and inaccurate and understates the level of significance of the impact of this proposed project on water service. 50-34

Mitigation number 5.3-6a states that water supply will be proven prior to building permits. But agencies tend to treat permits after a project is approved as "ministerial." The time to examine these issues is now. Given the current drought conditions in Fawnskin (and the mountains in general), with rate increases and water restrictions already in place, the County would be derelict in its duties of protecting the public health and resources available to current residents if it did not require the DEIR to demonstrate a proven water supply prior to approving any change in zoning. 50-35

The mitigations listed regarding landscape and outdoor watering are completely inadequate and illusionary. The mitigations listed are based on DWP's Stage 1 water restrictions, while we have already moved to Stage 2 water restrictions and DWP has announced that we could be moving to Stage 3 water restrictions before the end of summer. In addition, there is no information regarding how these mitigations would be enforced and current experience shows that the existing water usage restrictions are not being followed nor enforced. The DEIR should provide for the costs of enforcement. 50-36

D. Electricity. The DEIR states that project implementation would result in an increased demand for electricity, but that impacts would be less than significant. Bear Valley Electric (BVE) currently says no more electricity can be brought up the hill, and we are already 50-37

facing short supplies, so ANY additional development, including this proposal would create significant and unavoidable impacts on electricity service capabilities. This needs to be addressed. 50-37

Section 5.3-9 states that an alternative for providing power would be to place a power source at the site. This alternative does not describe the extensive additional impacts in terms of noise, air quality, and wildlife at a minimum. 50-38

VI. AESTHETICS/LIGHT AND GLARE

The DEIR states that there would be a significant and unavoidable impact that cannot be mitigated for the view areas on all sides of the proposed project. Even this analysis greatly understates and downplays the level of significance of the impacts on both adjacent properties and those across the lake.

The DEIR needs to address the requirements of the San Bernardino County Light Ordinance, which has been adopted by CSA 53B. 50-39

From the DEIR: "Implementation of the Moon Camp project would adversely impact scenic resources, scenic vistas and the visual character of the site and its surroundings. Analysis has concluded that a *significant and unavoidable* impact to the visual character and view shed from the project site, and surrounding areas would occur *which cannot be mitigated* to a less than significant level." (Emphasis added.) The obvious conclusion is that mitigation requires a far lesser density. 50-40

The simulated views in the DEIR do not include the housing density that is proposed and they are not done to the correct scale. They should be re-done. 50-41

The views used in Section 5.4 show an exceptional number of full-grown trees (between and near the homes) when in actual construction it would be highly unlikely that these trees would survive and new trees would take 50-100 years to grow to that size. This downplays the overall impacts the proposed project would have. 50-42

The DEIR in section 5.4 fails to consider the visual impact of a 100-boat marina, especially from the lake and from the ski areas, and the cumulative visual impact of the adjoining proposed Marina Point 175-boat marina, nor does it account for the visual impact of parking for usage of this proposed marina. The marina's impact on traffic, nighttime light impacting wildlife, and noise are not addressed 50-43

The DEIR does not address off-site storage locations for the 100 boats and trailers associated with the proposed marina, nor does it include any measures to keep them from being stored at each of the homes, with adjacent fuel spill risk thus increasing the level of significance of the impacts of this proposed project to the aesthetics. 50-44

VII. TRAFFIC AND CIRCULATION

The analysis of traffic and circulation in the DEIR is inadequate because it is based on some assumptions that are not justified:

- The "project" and "baseline" traffic analysis in the DEIR is based on a growth rate of traffic over the past 10 years. This is not accurate. 50-45

- The annual average in population growth for Big Bear from in the 2 years 2000-2002 is 14 times the annual average from 1990-2000. 50-46
- The annual average increase in number of houses built from 2000-2002 is over 8 times the annual average from 1990-2000. 50-47
- The DEIR also incorrectly assumes that peak hour traffic in the area is the "standard" AM and PM peaks. An actual analysis for this non-urban area, including weekend peaks, should be required 50-48

The DEIR needs to re-evaluate road and lane capacity under snowy or slick road conditions. For example, plowing only provides a limited pathway, but vacation use is intensified because of ski area traffic. 50-49

The DEIR failed to correctly consider the impact that straightening Route 38 will create and the likelihood that a straightened Route 38 will become the route of choice for all commercial traffic. This flow negates all traffic figures, trips, and volume studies assumed by the DEIR. 50-50

The DEIR does not take into account CalTrans information that Route 38 currently has a poor (congested) rating, and cannot adequately support the increased traffic ninety-two more homes and a marina would bring. 50-51

VIII. AIR QUALITY

The DEIR does not include either dispersion or photochemical modeling to predict the impact of the project on the concentrations of pollutants that will actually occur in the air in Big Bear Valley, nor the formation of toxic *secondary* pollutants *formed* by chemical reactions in air, e.g. ozone. It simply uses an emissions model to calculate the number of pounds per day of 50-52

primary pollutants that will be emitted *directly* by the project, and compares these to regional threshold values given in South Coast Air Management District (SCAMD) "look-up tables". This is a 6,600 square mile area and local impact studies are needed. 50-52

The DEIR completely omits treatment of even the emissions of three important air pollutants: SO_x, lead and toxic air contaminants (TACs). In the latter case for example, the threshold specified by the SCAMD is a maximum incremental cancer risk that is $\geq$ 10 in 1 million. The EIR does not identify the increased carcinogens that will be associated with the project and does not assess their impact against such a standard. The Big Bear Valley already has an inversion layer. 50-53

The DEIR does not adequately address the impacts of the increased wood smoke emissions from fireplaces and wood stoves. Again, SCAMC-wide figures are meaningless and studies of the Valley itself are needed. 50-54

Table 5.6-1 does not include California's standard for visibility reducing particles, the current levels in Big Bear Valley and how the project would impact this. 50-55

Emissions of toxic air contaminants, TACs (California)/hazardous air pollutants, HAPs (federal) from all of the sources associated with the project, both mobile sources and stationary sources, are not treated adequately, despite existing standards for TACs/HAPs. Specific studies of Big Bear Lake are needed for an informed decision. 50-56

The mitigation measures cited for air quality include the use of EPA certified fireplaces and the use of a catalytic converter on the chimneys. However, there is no legal mandate to do so and no analysis of the Country's ability to enforce such a rule. 50-57

The DEIR describes future hydrocarbon emissions standards for watercraft. However, it is not clear if these were included in the emissions estimates, or if they were, if it was assumed that all watercraft associated with the project would meet these new standards. This must be clarified and re-written. Furthermore, there is no treatment of emissions other than hydrocarbons from watercraft, and the associated impacts on air quality. On as revised report, the risk of emissions from spilled fuel are to be addressed. 50-58

Nothing has been included in the air quality analysis to evaluate the effects of a local power generating plant that was suggested in the DEIR. 50-59

The overall air quality analysis in the DEIR is completely inadequate and even though the DEIR has concluded that the development of this proposed project would cause significant and unavoidable impacts on air quality, those impacts have been underestimated and minimized substantially. They need to be addressed along with a cumulative impact study 50-60

IX. NOISE

The noise section of this DEIR utilizes data, which is decades old, making the analysis inadequate. The noise levels that would be generated, both during construction and of a permanent nature, would have significant continuing negative impact to wildlife and recreational 50-61

use as well as to the residents. The analysis needs to be redone, using current data and peak usage periods. 50-61

The statement in section 5.7-1 paragraph 3: "A 3 dBA change in sound pressure level is considered a "just detectable" difference in most situations" is incorrect. All of the conclusions that come from this flawed data are incorrect, and are the basis for much of the noise analysis of the DEIR. 50-62

The DEIR failed to consider the funneling effect of noise from the highway into the adjacent residential areas, and the impact the proposed wall would create. 50-63

The DEIR refers to "existing sensors within the vicinity of the project...." In fact, the sensors used in the analysis are not in the vicinity of the proposed project and therefore are not registering correct SPL's. No accurate measurement of current SPL levels is found in this document, so this analysis is flawed and inadequate. 50-64

Rather than measurements, the DEIR states "The (computer) model does not account for ambient noise levels or topographical differences between the roadway and adjacent land uses". The steep rise of the terrain to the north is significant and does not factor into the DEIR's computer model. If the terrain were considered in the analysis, the noise levels would become unacceptable. 50-65

The data used in the Noise analysis is in part from the Traffic Analysis report, which is completely inadequate and understates the noise impact, since the traffic analysis was completely invalid in ignoring (or not measuring) peak usage. This analysis needs to be re-done. 50-66

X. BIOLOGICAL RESOURCES

The DEIR's evaluation of the impacts on Biological Resources is incomplete and inadequate:

- There is no analysis in the DEIR of the impacts that would be caused by removal of a substantial number of trees for moving the highway and creating internal roads, nor for the subsequent removal of additional trees for building houses. 50-67
- The DEIR fails to recognize that in prior developments in the Big Bear valley, where the same eagle mitigations were instituted, the eagles have been effectively driven from those projects. It needs to explain why these failed factors will work. 50-68
- The potential removal of additional trees to support mitigation for a 100-foot fuel modification is not analyzed anywhere in the Biological Resources section. 50-69
- Drought-year botanical surveys yielded an incomplete assessment of rare plants. The result is an inaccurate document that clearly understates the expected extent and significance of impact to rare plants. 50-70
- The DEIR fails to include analysis of the impact to wildlife based on increases in road kill from the increased traffic and the loss of access to the lake due to construction of walls. 50-71

Plant surveys for areas that will be destroyed by road and other infrastructural construction need to be mitigated but this is not stated requiring further analysis. 50-72

At a 3:1 mitigation ratio for loss of pebble plains, it will be difficult if not impossible to find a willing seller of over 50 acres of pebble plains and associated rare plant habitat as 50 acres is approximately one quarter of the total available acreage on private land. The source needs to be identified. The DEIR also fails to state that the cost of the parcel needs to be based on a current appraisal of Bear Valley acreage, plus a reasonable dollar amount for management. 50-73

The analysis understates expected impacts to trees and eagles. Removal of 655 trees (24% of 2,772) is not analyzed or fully disclosed under "biological resources." This impact would constitute the removal of substantial eagle roost habitat. While the DEIR states that all trees over 20 inches in diameter will be protected, this applies only on individual lots and does not apply to road cutting and other structural changes required for the proposed project. Thus, the DEIR fails to protect perch trees as required by county code, which restricts removal of bald eagle perch trees "w/o adequate substitution". With normal exceptions to county code restrictions, the inevitability of tree cutting to create individual lots, and the removal of hazard trees and others to comply with fire clearance, this proposed project will significantly and negatively impact the bald eagle. The analysis is misleading and needs to be re-done. 50-74

XI. HYDROLOGY AND DRAINAGE

RBF consulting was directed by the County of San Bernardino to conduct a peer review of the 2003 "GSS Focused Geohydrologic Evaluation of Maximum Perennial Yield For the North Shore and Grout Creek Hydrologic Subunits" for incorporation into the DEIR. Engineering Geologist, D. Scott Magorien reviewed the report. He brought up six points (on pages 22 and 23) and did not think there was enough detail in the report to verify the water availability from the two wells on the tract. Magorien's conclusion is that the North Shore is in an overdraft situation, and that there should be a more thorough hydrogeologic investigation to determine the water availability for this proposed project. None of this recommended further analysis was included in the DEIR. 50-75

We are currently in the worst drought condition in history, but the EIR fails to include this in the analysis. The DEIR fails to include information and analysis on the degradation of water quality of the lake due to pesticides and chemical fertilizers being used. 50-76

With the current drought, and by the County's own hydrology expert's report, the impacts caused on hydrology and drainage created by the development this proposed project would have a higher level of significance than the DEIR states. It needs to be re-analyzed. 50-77

XII. CONCLUSION

The Draft EIR for the proposed Moon Camp Project currently in circulation has failed to adequately assess the level of significance of the negative impact on aesthetics, fire protection, police protection, water, electricity, traffic and circulation, air quality, noise, biological resources and hydrology and drainage. Further, once this DEIR has been revised, amended, or a supplemental document prepared, the entire document must be circulated once again so that the public and the decision-makers can be properly informed prior to making any decision on this project, as required by law. 50-78

The DEIR as it stands is incomplete, inaccurate, and defective and must be rejected in its present form. It clearly violates the requirements of CEQA.

Pete Tennyson Mary Tennyson

Response to Commentor No. 50
Peter and Mary Tennyson
May 17, 2004

50-1 Commentor refers to cumulative impacts associated with other foreseeable projects. Please refer to Response to Comment No. 13-2, which addresses this concern.

50-2 Commentor refers to the Project's impacts in regards to primary versus secondary homes. Please refer to Response to Comment No. 13-7, which addresses this concern.

50-3 Commentor refers to current drought conditions and affects to groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5, 13-98 and 18-1, which address these concerns.

50-4 Commentor refers to the enforcement process and procedures for implementation of mitigation measures. Please refer to Response to Comment No. 13-4, which addresses this concern.

50-5 Commentor refers to lack of agency consultation with various governmental agencies. Please refer to Response to Comment No. 13-5, which addresses this concern.

50-6 Commentor refers to the analysis of Alternatives and conclusion of the "Environmentally Superior Alternative." Please refer to Response to Comment No. 13-6, which addresses this concern.

50-7 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-8, which addresses this concern.

50-8 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment Nos. 13-9, 13-11 and 13-12, which address this concern.

50-9 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-13, which addresses this concern.

50-10 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-15, which addresses this concern.

50-11 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment No. 13-17, which addresses this concern.

50-12 Commentor refers to cumulative impacts associated with other foreseeable projects. Please refer to Response to Comment No. 13-2, which addresses this concern.

50-13 Commentor refers to increased population and affects to infrastructure. Please refer to Response to Comment No. 13-19, which addresses this concern.

50-14 Commentor refers to the Project's consistency with the County's General Plan. Please refer to Response to Comment Nos. 13-20 and 13-21, which addresses this concern.

50-15 Commentor refers to proposed highway realignment and affects to the existing aesthetic character. Please refer to Response to Comment No. 13-22, which addresses this concern.

50-16 Commentor refers to the proposed marina facilities and affects to the lake and traffic. Please refer to Response to Comment No. 13-24, which addresses these concerns.

50-17 Commentor refers to the use and storage of fuels and affects to fire safety and water quality. Please refer to Response to Comment No. 13-35, which addresses this concern.

50-18 Commentor refers to lake usage statistics and affects to recreational facilities/uses. Please refer to Response to Comment No. 13-25, which addresses this concern.

50-19 Commentor refers to decreased public access to the lakeshore. Please refer to Response to Comment No. 13-26, which addresses this concern.

50-20 Commentor refers to decreased public access to the lakeshore. Please refer to Response to Comment No. 13-26, which addresses this concern.

50-21 Commentor refers to decreased public access to the lakeshore. Please refer to Response to Comment No. 13-26, which addresses this concern.

50-22 Commentor refers to accuracy of current Fire Risk Level designation. Please refer to Response to Comment No. 13-27, which addresses this concern.

50-23 Commentor refers to water capacity and affects to fire protection services. Please refer to Response to Comment No. 13-28, which addresses this concern.

50-24 Commentor refers to utilization of fire sprinklers in the analysis of fire protection services. Please refer to Response to Comment No. 13-29, which addresses this concern.

50-25 Commentor refers to the marina facilities and affects to fire protection services. Please refer to Response to Comment No. 13-35, which addresses this concern.

50-26 Commentor refers to enforcement of mitigation measures identified for fire protection services. Please refer to Response to Comment No. 13-31, which addresses this concern.

50-27 Commentor refers to increased traffic and affects to evacuation plans. Please refer to Response to Comment No. 13-32, which addresses this concern.

50-28 Commentor refers to the urban/forest interface and the increased fire risk associated with the Project. Please refer to Response to Comment Nos. 4-1, 4-4, and 13-27, which address these concerns.

50-29 Commentor refers to increased fire risk potential and affects to fire insurance. Please refer to Response to Comment No. 13-36, which addresses this concern.

50-30 Commentor refers to current police response times and the Project's impact to police services. Please refer to Response to Comment Nos. 13-38 to 13-39, which address this concern.

50-31 Commentor refers to non-emergency call and affects to police protection services. Please refer to Response to Comment No. 13-40.

50-32 The County will consider the Commentor's opinion during their deliberation on the project.

50-33 Commentor refers to the applicability of SB 221. Please refer to Response to Comment No. 13-42, which addresses this concern.

50-34 Commentor refers to water supply and affects to future water service and groundwater. Please refer to Response to Comment No. 13-43, which addresses these concerns.

50-35 The County will consider the Commentor's opinion during their deliberation on the project.

50-36 Commentor refers to appropriateness of mitigation measures regarding water service. Please refer to Response to Comment No. 13-47, which addresses this concern.

50-37 Commentor refers to current electric power shortages and the Project's impact to electric services. Please refer to Response to Comment No. 13-49, which addresses this concern.

50-38 Commentor refers to the potential impacts as a result of constructing an alternative electrical power source on the project site. Please refer to Response to Comment No. 13-50, which addresses these concerns.

50-39 Commentor refers to light and glare affects conflicting with the San Bernardino County Light Ordinance. Please refer to Response to Comment No. 13-52, which addresses this concern.

50-40 The County will consider the Commentor's opinion during their deliberation on the project.

50-41 Commentor refers to the visual simulations not being reflective of build-out of the project area. Please refer to Response to Comment No. 13-54, which addresses this concern.

50-42 Commentor refers to the visual simulations not being reflective of future vegetation. Please refer to Response to Comment No. 13-55, which addresses this concern.

50-43 Commentor refers to the proposed marina facility and affects to the existing aesthetic character. Please refer to Response to Comment Nos. 13-52 and 13-56, which address this concern.

50-44 Commentor refers to off-site storage locations of boats and trailers and affects to the existing aesthetic character. Please refer to Response to Comment No. 13-57, which addresses this concern.

50-45 Commentor refers to the growth rate utilized in the traffic analysis. Please refer to Response to Comment No. 13-58, which addresses this concern.

50-46 Comment is noted. Also, please refer to Response to Comment No. 13-58 regarding the growth rate utilized in the traffic analysis.

50-47 Comment is noted. Also, please refer to Response to Comment No. 13-58 regarding the growth rate utilized in the traffic analysis.

50-48 Commentor refers to the determination of the peak hour referenced in the traffic analysis. Please refer to Response to Comment No. 13-59, which addresses this concern.

50-49 Commentor refers to snowy/wet roadway conditions and affects to traffic. Please refer to Response to Comment No. 13-60, which addresses this concern.

50-50 Commentor refers to the proposed highway realignment and the affects to traffic. Please refer to Response to Comment No. 13-63, which addresses this concern.

50-51 Commentor refers to Caltrans rating of State Route 38 and affects to traffic. Please refer to Response to Comment No. 13-64, which addresses this concern.

50-52 Commentor refers to the methodology utilized to analyze air quality impacts. Please refer to Response to Comment No. 19-3, which addresses this concern.

50-53 Commentor refers to the lack of analysis of SOx, lead and toxic air contaminates in the Draft EIR. Please refer to Response to Comment No. 19-4, which addresses this concern.

50-54 Commentor refers to potential air quality impacts associated with wood smoke emissions from wood stoves and fireplaces. Please refer to Response to Comment No. 19-6, which addresses this concern.

50-55 Commentor refers to potential impacts associated with visibility reducing particles. Please refer to Response to Comment No. 19-7, which addresses this concern.

50-56 Commentor refers to air quality impacts associated with toxic air contaminates. Please refer to Response to Comment No. 19-10, which addresses this concern.

50-57 Commentor refers to practicality of enforcing mitigation requiring EPA certified fireplaces. Please refer to Response to Comment No. 19-13, which addresses this concern.

50-58 Commentor refers to hydrocarbon emissions from watercraft and affects to air quality. Please refer to Response to Comment No. 19-14, which addresses this concern.

50-59 Commentor refers to the local power generating plant and affects to air quality. Please refer to Response to Comment No. 13-76, which addresses this concern.

50-60 The County will consider the Commentor's opinion during their deliberation on the project.

50-61 Commentor refers to modeling data utilized in assessing noise impacts. Please refer to Response to Comment No. 13-78, which addresses this concern.

50-62 Commentor refers to noise impact criteria utilized in the noise impact analysis. Please refer to Response to Comment No. 13-79, which addresses this concern.

50-63 Commentor refers to the funneling noise effect from increased traffic. Please refer to Response to Comment No. 13-80, which addresses this concern.

50-64 Commentor refers to sensitive receptors and affects to the noise environment. Please refer to Response to Comment No. 13-81, which addresses this concern.

50-65 Commentor refers to topographical differences and affects to the noise environment. Please refer to Response to Comment No. 13-83.

50-66 Commentor refers to the reliability of the traffic data utilized to conduct the noise impact analysis. Please refer to Response to Comment Nos. 13-2 and 13-58 to 13-65. The County will consider the Commentor's opinion and comments during their deliberation on the project.

50-67 Commentor refers to the loss of trees and the affects to biological resources. Please refer to Response to Comment No. 13-86, which addresses this concern.

50-68 Commentor refers to cumulative impacts to the bald eagle. Please refer to Response to Comment No. 13-88, which addresses this concern.

50-69 Commentor refers to the loss of trees within the fuel modification zone and the affects to biological resources. Please refer to Response to Comment No. 13-86, which addresses this concern.

50-70 Commentor refers to adequacy of biological resources surveys in drought years. Please refer to Response to Comment Nos. 3-5 and 13-90, which address this concern.

50-71 Commentor refers to increased traffic and affects to biological resources from increased amounts of road-kill. Please refer to Response to Comment No. 13-91, which addresses this concern.

50-72 Commentor refers to vegetation within the constriction zone and affects to biological resources. Please refer to Response to Comment No. 13-92, which addresses this concern.

50-73 Commentor refers to likelihood of finding a property owner to sell land in accordance with the special status plant and vegetation mitigation. Please refer to Response to Comment Nos. 3-5, 13-86 and 13-92, which address this concern.

50-74 Commentor refers to impacts to the bald eagle. Please refer to Response to Comment No. 13-95, which addresses this concern.

50-75 Commentor refers to water supply and impacts to groundwater. Please refer to Response to Comment No. 13-97, which addresses this concern.

50-76 Commentor refers to current drought conditions and affects to groundwater. Please refer to Response to Comment Nos. 13-98 and 13-99, which address this concern.

50-77 The County will consider the Commentor's opinion during their deliberation on the project.

50-78 The County will consider the Commentor's opinion during their deliberation on the project.

RECEIVED
MAY 24 2004
CURRENT PLANNING

May 21, 2004

County of San Bernardino
Land use Services Department
Planning Division
385 N. Arrowhead Avenue, 1st Flr.
San Bernardino, CA 92415-0182

RECEIVED
MAY 25 2004
LAND USE
ADVANCE PLANNING

Attention: Matthew W. Slowik

RE: Draft EIR for the Moon Camp Development Project/RCK Properties, Inc.

Dear Mr. Slowik,

Thank you for this opportunity to review this document. My husband and I have been homeowners in Fawnskin since 1996. We have enjoyed the clean air, wildlife, and stress-free life living in a mountain atmosphere has afforded us during our retirement years.

Garry and I oppose the Moon Camp project as presently designed because the DEIR fails to adequately evaluate the true impact this project would cause mainly due to the shortage of water in Big Bear. Our own use of water has been restricted for another year with further reductions in usage to continue due to an ongoing draught. It makes no sense to allow this or any corporation to build housing on the hill when we have an extreme lack of water, the largest fire hazard in the country, trees dying by the millions in the forest, and only a two lane road if an evacuation occurs again this year. Most households have at least two cars, so that would mean a minimum of 400 more cars on the hill. Last year was frightening enough, taking four hours to get off the hill during the fires. The loss in lives could be enormous if fires hit the Big Bear area this season. 51-1

Please address these issues and reconsider allowing such a project to prevail.

Sincerely,

Garry and Judith Schkade
39334 Garden Place
Fawnskin, CA 92333-0133

Response to Commentor No. 51
Garry and Judith Schkade
May 21, 2004

51-1 Commentor refers to traffic impacts and affects to evacuation plans. Please refer to Response to Comment No. 13-32, which addresses this concern. The County will consider the Commentor's opinion during their deliberation on the project.

May 27, 2004

RECEIVED
MAY 2004
PROJECT PLANNING

To Whom it May Concern,

In regards to the letter about the mooncamp development project on 62 acres in the Big Bear area (Fawnskin).

I have some concerns should the zone change be allowed. The proposal calls for 95 residential lots. I have concerns about water. There is already a shortage of water available for the homes and lots that are there now. What will happen when the already developed vacant lots get built upon? That will require even more water then the area is using now and that does not even include the proposed 95 lots. 52-1

What about the wildlife that lives in the area and needs the trees or the natural undisturbed ground to make their homes. 52-2

Also of concern is the lake. The proposal calls for a boat dock and that means more boats and polution into the lake. 52-3

I certainly think a consideration for all the unbuilt lots and what will happen when they all have homes on them should be thought about now, as those developments are already in but the burden to the water system, lake, wildlife, etc. has not occured as the houses are not all built yet. 52-4

With these things in mind I do not think it would be a good idea to put in 95 more lots and take more forest away from the plants, animals, insects, and other things that need it.

52-5

Response to Commentor No. 52
Stephen Youngerman
May 27, 2004

52-1 Commentor refer to water supply and the affects to groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5 and 18-1, which addresses this concern. The County will consider the Commentor's opinion during their deliberation on the project.

52-2 Impacts to biological resources are discussed in Section 5.8, *Biological Resources*, in the EIR.

52-3 Commentor refers to the proposed marina facility and affects to the water quality of the lake. Please refer to Response to Comment No. 13-99, which addresses this concern.

52-4 The County will consider the Commentor's opinion during their deliberation on the project.

52-5 The County will consider the Commentor's opinion during their deliberation on the project.

COMMENT NO. 53

MARC & MILDRED MANDEL
10446 LAKEWOOD BLVD., SUITE 104
DOWNEY, CA 90241-2763
(562) 861-0657

RECEIVED
JUL 2004
LAND USE SERVICES DEPT.

June 28, 2004

RECEIVED
JUL 0 2 2004
RBF CONSULTING

Matthew W. Slowik, Sr. Associate Planner
County of San Bernardine,
Land Use Services Dept., Planning Div.
385 N. Arrowhead Ave., 1st Floor
San Bernardino, CA 92415-0182

RE: Applicant: MOONCAMP DEVELOPMENT PROJECT / RCK PROPERTIES, INC.

Dear Mr. Slowik,

We are property owners in Fawnskin at 955 Deer Trail Lane, Parcel # 0304-422-05 and we are filing our comments referencing the draft ***EIR*** and objections to the above noted project. Please see the two (2) page attachment to this letter.

Also, this is a request for all regular and special notices regarding the noted project to be promptly sent to us at:

MARC & MILDRED MANDEL
10446 LAKEWOOD BLVD., SUITE 104
DOWNEY, CA 90241-2763

Thank you for your prompt attention to this request.

Sincerely yours,

Marc Mandel

Enclosures: Attachment pages 1 & 2

CC: F o F Advisory Committee

ATTACHMENT TO LETTER DATED 6/4/2004

THE FOLLOWING IS A LIST OF RESPONSES AND OBJECTIONS TO THE NOTED PROJECT AND THE ***DRAFT EIR*** THAT WE HAVE TO THE *GENERAL PLAN / LAND USE DISTRICT AMENDMENT* AND *TENTATIVE TRACT 16136.*

1. We are concerned about the project on the basis that the proposed lake front lots would destroy the lake-view from the existing highway and eliminate public access. 53-1

2. We are concerned about the project on the basis that the project would require the realignment of State Route 38 northward so as to provide adequate lake front lots. 53-2

3. We object to the project on the basis that currently there is insufficient water in Fawnskin to support 92 additional residences. In addition, the insufficient water supply, if further taxed, would create a greater problem in case of a major fire in the area of which there is a high potential due to the lack of rain and snow. As you are aware, the water problem in Big Bear is critical and reports are that this situation will continue for some years to come. We are on restricted watering use. 53-3

4. We object to the project on the basis that a 92 home subdivision will create serious light pollution in the Fawnskin area. 53-4

5. We are concerned about the project on the basis that the number of trees, approximately 750 or 25% of the trees in the project area that would have to be removed to: A) relocate the highway, B) create home sites, C) create roads within the project and D) create easements. 53-5

6. We are concerned about the project on the basis that any down-zoning would destroy the eagle winter habitat. As an example, on one tree in the project area there have been as many as three eagles seen perched on one tree. 53-6

7. We are concerned about the project on the basis that with people now building large houses on minimum-sizes lots in Big Bear, any down-zoning in Fawnskin would be inconsistent with the mountain character of Fawnskin. In addition, the density of lots projected is tighter than some major city lots including some areas of Los Angeles City. 53-7

8. We are concerned about the project on the basis that State Route 38 in the project area would not adequately support traffic flow in that area, creating traffic problems by increasing the current 300 trips per day to at least 900 trips per day. 53-8

9. We are concerned about the project on the basis that any proposed moving of State Route 38 would increase traffic noise levels to the existing residences above and near the development. 53-9

CONTINUED ON ATTACHMENT PAGE 2

10. We are concerned about the project on the basis that the increase of sewage would be beyond the capacity of the existing treatment plant. 53-10

11. We are concerned about the project on the basis that it would create air pollution due to: A) the increase vehicle traffic and B) the increase number of fireplaces. In winter we now experience an inversion layer due to the fireplaces and any increase would be intolerable. 53-11

12. We are concerned about the project on the basis that the increase in population in the project area would increase the noise pollution. 53-12

13. We object to the project on the basis that the development could cause an increase in various fees that the existing residents would have to pay, i.e. sewer, etc. 53-13

14. We object to the project on the basis that there are endangered species, both animal and plant life, in the project area that would be destroyed. 53-14

15. We are concerned about the project on the basis that the 100 private dock marina: 1) removes public access to the lake, 2) adds noise pollution, and 3) adds air pollution. 53-15

16. We object to the project on the basis that no zoning changes are acceptable. 53-16

17. We object to the project on the basis that the project area should be held as a controlled "Public Use Area" and a preserve for natural habitat. 53-17

18. We are concerned about the project on the basis that in addition to the various pollution items noted above, there is another pollution item and that is *light*. With all the proposed homes, the amount of light will create a great annoyance 53-18

Response to Commentor No. 53
Marc and Mildred Mandel
June 28, 2004

53-1 Section 5.4, *Aesthetics/Light and Glare*, concludes that project implementation would result in significant and unavoidable impacts for viewshed alterations involving existing residents to the north, south, east and west of the project site. Additionally, significant and unavoidable impacts have been identified for views from State Route 38, a scenic highway, to the south and from the south shore of Big Bear Lake. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA. Public access is discussed in Response to Comment No. 13-26.

53-2 The Commentor refers to the realignment of State Route 38, but does not refer to any specific environmental impacts. No further response is necessary.

53-3 Commentor refers to water supply and affects to groundwater. Please refer to Response to Comment Nos. 1-3, 1-4, 1-5, 13-47 and 21-3, which address this concern.

53-4 Commentor refers to light and glare impacts associated with development of the project area. Please refer to Response to Comment No. 13-52, which addresses this concern.

53-5 Commentor refers to the loss of trees and the affects to biological resources. Please refer to Response to Comment No. 13-86, which addresses this concern.

53-6 Commentor refers to impacts to the bald eagle. Please refer to Response to Comment Nos. 3-7, 13-86, 13-88, 13-95 and 41-14, which address this concern.

53-7 The Commentor refers to the project's density and impacts to the existing aesthetic character. Please refer to Response to Comment No. 53-1, which addresses this concern. The County will consider the Commentor's opinion during their deliberation on the project.

53-8 Commentor refers to the density of the project and affects to traffic. Please refer to Response to Comment Nos. 13-58 to 13-65, which address this concern.

53-9 Commentor refers to the realignment of the highway and affects to the existing noise environment. Please refer to Response to Comment Nos. 13-80, 13-81 and 26-15, which address this concern.

53-10 As stated in the EIR and Sewer Feasibility Report, the existing Big Bear Area Regional Wastewater Agency (BBARWA) sewer system located to the east of the project site would be capable of handling wastewater flow from the proposed project. Thus, the proposed project would not result in the need to construct new wastewater facilities or require the expansion of new wastewater facilities. The proposed project would be required to comply with applicable BBARWA (and Collecting Agencies, if

required) rules and regulations pertaining to construction and operation of facilities, in addition to required payment of all new and modified facility fees. To ensure that impacts remain at less than significant levels, mitigation measures have been recommended. Mitigation for the project includes that the Project Applicant shall provide evidence to the County of San Bernardino that the BBARWA has sufficient transmission and treatment plant capacity to accept sewage flows from the project site.

53-11 Regarding vehicular emissions, the project would result in an overall increase in the local and regional pollutant load due to direct impacts from vehicle emissions. Combined mobile and area source emissions would exceed SCAQMD thresholds for ROG, CO and PM_{10}. These exceedances are considered significant and cannot be mitigated to a less than significant level. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with Section 15093 of CEQA.

Please refer to Response to Comment No. 19-6 for impacts regarding fireplaces.

53-12 Commentor refers to the increase in population and affects to the noise environment. Please refer to Response to Comment No. 28-2, which addresses this concern.

53-13 The County will consider the Commentor's opinion during their deliberation on the project.

53-14 Section 5.8, *Biological Resources*, discusses impacts to biological resources as a result of project implementation. As stated in Response to Comment No. 13-88, the EIR analysis has been modified to conclude that project implementation would result in significant and unavoidable impacts to wintering bald eagle populations. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA.

53-15 Commentor refers to the proposed marina facility and affects to public access, noise levels, and air quality. Please refer to Response to Comment Nos. 13-26, which addresses public access; refer to Response to Comment No. 28-2, which addresses noise; and refer to Response to Comment No. 19-14, which address air quality.

53-16 The County will consider the Commentor's opinion during their deliberation on the project.

53-17 The project site is private property and not designated for public use areas. However, the County will consider the Commentor's opinion during their deliberation on the project.

53-18 Commentor refers to light and glare impacts associated with development of the project area. Please refer to Response to Comment No. 13-52, which addresses this concern.

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14.3 LIST OF COMMENTORS: 45-DAY RECIRCULATION REVIEW

FEDERAL, STATE AND LOCAL GOVERNMENT AGENCIES

1. Mark Butala, Southern California Association of Governments
2. Kelly Rozich, County of San Bernardino
3. Terry Roberts, California Governor's Office of Planning and Research, State Clearinghouse and Planning Unit

PRIVATE/SPECIAL INTEREST GROUPS

4. Bryan Wilkie, The Gas Company
5. Timothy Krantz, San Bernardino Valley Audubon Society
6. Erv Nichols, Sierra Club
7. Sandy Steers, Friends of Fawnskin
8. David Goodward, San Bernardino Valley Audubon Society

INDIVIDUALS

9. Carol Enos
10. Betty Conroy
11. Diane Shattuck
12. Sandra Ellis
13. Rush Wallace
14. Loretta Gardner
15. Unknown
16. George Kast
17. Robert Drake
18. Mary Lu Drake
19. Sandy Steers
20. Donald Wheeler and Wheeler Family
21. Lisa Patterson
22. Roman Silberfeld
23. Nancy and Bill Hazewinkel
24. Daniel Levenick
25. James and Lola McGrew
26. Peter and Mary Tennyson
27. Bradley and Cathy Winch
28. B.J. Finlayson-Pitts and James Pitts
29. Michael Karp

COMMENT NO. 1

SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS

Main Office
818 West Seventh Street
12th Floor
Los Angeles, California
90017-3435

t (213) 236-1800
f (213) 236-1825

www.scag.ca.gov

Officers: President: Mayor Pro Tem Ron Roberts, Temecula • First Vice President: Councilmember Toni Young, Port Hueneme • Second Vice President: Supervisor Yvonne Burke, Los Angeles County

Imperial County: Victor Carrillo, Imperial County, Jo Shields, Brawley

Los Angeles County: Yvonne Brathwaite Burke, Los Angeles County • Zev Yaroslavsky, Los Angeles County • Jim Aldinger, Manhattan Beach • Harry Baldwin, San Gabriel • Paul Bowlen, Cerritos • Tony Cardenas, Los Angeles • Margaret Clark, Rosemead • Gene Daniels, Paramount • Mike Dispenza, Palmdale • Judy Dunlap, Inglewood • Rae Gabelich, Long Beach • Eric Garcetti, Los Angeles • Wendy Greuel, Los Angeles • Frank Gurulé, Cudahy • James Hahn, Los Angeles • Janice Hahn, Los Angeles • Isadore Hall, Compton • Tom LaBonge, Los Angeles • Martin Ludlow, Los Angeles • Cindy Miscikowski, Los Angeles • Paul Nowatka, Torrance • Pam O'Connor, Santa Monica • Alex Padilla, Los Angeles • Bernard Parks, Los Angeles • Jan Perry, Los Angeles • Ed Reyes, Los Angeles • Greig Smith, Los Angeles • Tom Sykes, Walnut • Paul Talbot, Alhambra • Sidney Tyler, Pasadena • Tonia Reyes Uranga, Long Beach • Antonio Villaraigosa, Los Angeles • Dennis Washburn, Calabasas • Jack Weiss, Los Angeles • Bob Yousefian, Glendale • Dennis Zine, Los Angeles

Orange County: Chris Norby, Orange County • John Beauman, Brea • Lou Bone, Tustin • Art Brown, Buena Park • Richard Chavez, Anaheim • Debbie Cook, Huntington Beach • Cathryn DeYoung, Laguna Niguel • Richard Dixon, Lake Forest • Marilyn Poe, Los Alamitos • Tod Ridgeway, Newport Beach

Riverside County: Jeff Stone, Riverside County • Thomas Buckley, Lake Elsinore • Bonnie Flickinger, Moreno Valley • Ron Loveridge, Riverside • Greg Pettis, Cathedral City • Ron Roberts, Temecula

San Bernardino County: Gary Ovitt, San Bernardino County • Lawrence Dale, Barstow • Paul Eaton, Montclair • Lee Ann Garcia, Grand Terrace • Susan Longville, San Bernardino • Deborah Robertson, Rialto • Alan Wapner, Ontario

Ventura County: Judy Mikels, Ventura County • Glen Becerra, Simi Valley • Carl Morehouse, San Buenaventura • Toni Young, Port Hueneme

Orange County Transportation Authority: Lou Correa, County of Orange

Riverside County Transportation Commission: Robin Lowe, Hemet

Ventura County Transportation Commission: Keith Millhouse, Moorpark

RECEIVED
APR 11 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

April 5, 2005

Mr. Matthew Slowick
County of San Bernardino, Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

RE: SCAG Clearinghouse No. I 20050123 Moon Camp Residential Subdivision Projection, Revised Biological Resources Section, DEIR

Dear Mr. Slowik:

Thank you for submitting the **Moon Camp Residential Subdivision Projection** for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

We have reviewed the **Moon Camp Residential Subdivision Projection**, and have determined that the proposed Project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and California Environmental Quality Act (CEQA) Guidelines (Section 15206). Therefore, the proposed Project does not warrant comments at this time. Should there be a change in the scope of the proposed Project, we would appreciate the opportunity to review and comment at that time.

1–1

A description of the proposed Project was published in SCAG's **March 1-15, 2005** Intergovernmental Review Clearinghouse Report for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this Project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1867. Thank you.

Sincerely,

MARK BUTALA
Senior Regional Planner
Intergovernmental Review

SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS 40 YEARS Resolving Regional Challenges 1965 2005

Response to Commentor No. 1
Mark Butala, Southern California Association of Governments
April 5, 2005

1-1 The Southern California Association of Governments (SCAG) has reviewed the Recirculated Public Review Draft EIR and has determined that the proposed project is not regionally significant per SCAG Intergovernmental Review Criteria and CEQA guidelines (Section 15206). No further response to this comment is necessary at this time.

COMMENT NO. 2

Slowik, Matt - Planning

From: Rozich, Kelly-DPW
Sent: Tuesday, April 12, 2005 3:25 PM
To: Slowik, Matt - Planning
Subject: RE: Comments on Revised Biological Resources Section of Draft EIR - Mooncamp Development

We have no comments. 2-1

Thank you,

Kelly A. Rozich (rose-itch)
(909) 387-8114
Senior Associate Planner
Environmental Management Division
San Bernardino County Public Works Department

Response to Commentor No. 2
Kelly Rozich, San Bernardino County Public Works Department
April 12, 2005

2-1 The San Bernardino County Public Works Department, Environmental Management Division has no comments on the Recirculated Public Review Draft EIR. No further response to this comment is necessary at this time.

COMMENT NO. 3

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Sean Walsh
Director

RECEIVED
APR 20 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

April 18, 2005

Matthew Slowik
San Bernardino County Land Use Services Department
385 N. Arrowhead Ave., 1st Floor
San Bernardino, CA 92415-0182

Subject: Moon Camp
SCH#: 2002021105

Dear Matthew Slowik:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on April 15, 2005, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

3-1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2002021105
Project Title Moon Camp
Lead Agency San Bernardino County Land Use Services Department

Type EIR Draft EIR

Description GPA/OLUD to establish a 95-lot residential subdivision, with 92 numbered lots and 3 lettered lots.

Lead Agency Contact

Name Matthew Slowik
Agency San Bernardino County Land Use Services Department
Phone (909) 387-4147 **Fax**
email
Address 385 N. Arrowhead Ave., 1st Floor
City San Bernardino **State** CA **Zip** 92415-0182

Project Location

County San Bernardino
City
Region
Cross Streets Canyon Road and Polique Canyon Road
Parcel No. 0304-082-14; 0304-091-12, 13, 21
Township 2N **Range** 1W **Section** 13 **Base** SBBM

Proximity to:

Highways 38
Airports
Railways
Waterways Big Bear Lake
Schools
Land Use BV/RL-40 (Rural Living - 40 acre minimum lot size)

Project Issues Cumulative Effects; Vegetation; Wetland/Riparian; Wildlife

Reviewing Agencies Resources Agency; Regional Water Quality Control Board, Region 8; Department of Parks and Recreation; Native American Heritage Commission; Department of Forestry and Fire Protection; Office of Emergency Services; Department of Health Services; Department of Fish and Game, Region 6; Department of Water Resources; California Highway Patrol; Caltrans, District 8; State Lands Commission

Date Received 03/02/2005 **Start of Review** 03/02/2005 **End of Review** 04/15/2005

Note: Blanks in data fields result from [illegible] information provided by [illegible]

Response to Commentor No. 3
Terry Roberts, California Governor's Office of Planning and Research, State Clearinghouse and Planning Units
April 18, 2005

3-1 The Commentor acknowledges that the Recirculated Public Review Draft EIR has complied with State Clearinghouse review requirements and has been forwarded to select State agencies for review. No further response to this comment is necessary at this time.

COMMENT NO. 4

The Gas Company®

A Sempra Energy® company

Southern California Gas Company
1981 W. Lugonia Avenue
Redlands, CA 92374-9720

Mailing Address:
PO Box 3003, SC8031
Redlands, CA 92373-0306

RECEIVED
MAR 31 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

MAR 30 2005
CURRENT PLANNING

March 24, 2005

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Attention: Matthew Slowik, Senior Associate Planner

Re: Notice of Availability of the Revised Biological Resources Section of the Draft Environmental Impact Report for the Mooncamp Development Project (Case No. TTM 16136)
City of Big Bear

Thank you for the opportunity to respond to the above-referenced project. Please note that Southern California Gas Company has facilities in the area where the above named project is proposed. Gas service to the project could be provided without any significant impact on the environment. The service would be in accordance with the Company's policies and extension rules on file with the California Public Utilities Commission at the time contractual arrangements are made.

You should be aware that this letter is not to be interpreted as a contractual commitment to serve the proposed project, but only as an informational service. The availability of natural gas service, as set forth in this letter, is based upon present conditions of gas supply and regulatory policies. As a public utility, The Southern California Gas Company is under the jurisdiction of the California Public Utilities Commission. We can also be affected by actions of federal regulatory agencies. Should these agencies take any action, which affects gas supply, or the conditions under which service is available, gas service will be provided in accordance with revised conditions.

4–1

Typical demand use for:

a. Residential (System Area Average/Use Per Meter) Yearly

Single Family	799 therms/year dwelling unit
Multi-Family 4 or less units	482 therms/year dwelling unit
Multi-Family 5 or more units	483 therms/year dwelling unit

These averages are based on total gas consumption in residential units served by Southern California Gas Company, and it should not be implied that any particular home, apartment or tract of homes will use these amounts of energy.

b. Commercial

Due to the fact that construction varies so widely (a glass building vs. a heavily insulated building) and there is such a wide variation in types of materials and , a typical demand figure is not available for this type of construction. Calculations would need to be made after the building has been designed.

4–1

We have Demand Side Management programs available to commercial/industrial customers to provide assistance in selecting the most effective applications of energy of our energy conservation programs, please contact our Commercial/Industrial Support Center at 1-800-GAS-2000.

Sincerely,

Bryan Wilkie
Technical Supervisor

BPW/ocf

Response to Commentor No. 4
Bryan Wilkie, The Gas Company
March 24, 2005

4-1 As indicated by The Gas Company during the 45-day public review period for the Recirculated Draft EIR (Comment Letter No. 8, dated April 21, 2004) it has been acknowledged that gas service to the project could be provided without any significant impact to the environment. No further response to this comment is necessary at this time.

COMMENT NO. 5

RECEIVED
APR 18 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

April 14, 2005

Subject: Comments on the Supplemental Biological Impact Assessment of the proposed Moon Camp Residential Subdivision, T.T. 16136

ATTN: Mr. Matt Slowik, Sr. Assoc. Planner
County of San Bernardino
385 N. Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182

FROM: Dr. Timothy Krantz
University of Redlands
1200 East Colton Avenue, Duke Hall
Redlands, CA 92373-0999

Dear Mr. Slowik:

Upon review of the Supplemental Biological Resources Impact Assessment (BRIA) circulated for the Moon Camp project, the following comments are respectfully submitted.

The BRIA identifies a long list rare plant species considered to have a high probability of occurring on site. In fact, several additional special status species are known to occur on the property (*Mimulus purpureus p., Pyrrocoma uniflora gossypina*, et al.) and others are likely to occur on site. Focused rare plant surveys were completed during July 2003 by BonTerra consultants. This was an exceptionally dry year and many annual species (ie. *Mimulus purpureus p.*) failed to flower in that season. Furthermore, July is too late to reliably see many of the earlier flowering species. For example, this year has been an unusually wet year and should be very good for plant surveys. However, I just completed a plant taxonomy field trip for a University of Redlands class and found many species already in full flower, and some already with mature fruits. The EIR as much as admits that **the previous survey for rare plants was inadequate** by drafting the newly proposed Mitigation Measure 5.8-1a, which calls for another focused survey prior to issuance of grading permits; and then off-site mitigation at a ratio of 3:1 for each acre of sensitive plant habitat destroyed by the development. 5-1

We believe that the focused rare plant surveys should be completed prior to certification of the Final EIR. In this good rainfall year, the survey could be completed by the end of June, and potential modifications to the development plan could be considered to avoid sensitive resources to the extent possible. 5-2

The DEIR and Supplemental BRIA minimize the significance of the impacts to pebble plains habitat. In fact, although the (inadequate) rare plant survey identified only 0.69ac of pebble plain habitat on site, the full extent of pebble plain habitat is most likely significantly greater than that. Even so, the DEIR then minimizes the relative degree of significance by saying that in comparison with the total distribution of this habitat type (379ac), the project site only contains 0.18% of the total distribution. **One should keep in mind that this is the entire distribution of this plant community in the world!** Furthermore, no other pebble plains are known to occur in the vicinity of the 5-3

project (Fawnskin area); a fact that will be borne out when the applicants attempt to identify mitigation acreage that is not already protected on public lands. 5–3

The DEIR and Supplemental BRIA identify nine bald eagle perch trees on site. These trees are occasionally used, primarily for perching with a direct line-of-sight to prey on the lake (foraging habitat). **Any proposed dredging, including the adjacent Marina Point project to the west, will result in deepening and, therefore, lessening the suitability of the shoreline habitat for foraging bald eagles.** 5–4

Mitigation 5.8-1b regards bald eagle perch trees. Simply identifying eagle perch trees on private lots has not been successfully implemented on several other residential subdivisions in Big Bear Valley, most notably the Eagle Point and Castle Glen subdivisions in the City of Big Bear Lake. In both of these cases, the Homeowners Association (HOA) was supposedly charged with enforcing the building restrictions for homes constructed on lots with bald eagle perch trees. The result, after 15 years, has been that homes have extended their irrigated (sod) landscaping under the trees, thereby weakening them. Jeffrey pines need no additional irrigation, and in fact may suffer root rot and other diseases when structures are built within the drip-lines of the trees, or if over-watered. 5–5

We believe the only tenable mitigation measure to protect wintering bald eagle perch trees is the establishment of non-salable letter lots to ensure that residences, driveways, roads, and irrigated landscaping do not encroach on them. In fact when one considers the presence of five of the perch trees ***and*** the pebble plain habitat occurring together in the west portion of the project site, it would appear that this may represent a dual-purpose conservation Letter Lot. Any letter lot, created for the purpose of conservation of bald eagle perch trees and/or pebble plain habitat should be conveyed to a natural resources management entity with a Conservation Easement, as called for in Mitigation Measure 5.8-1a. Any parcels acquired or set aside for mitigation of sensitive biological resources should also have conditions requiring funding to be set aside for the purpose of maintenance and stewardship of such resources in perpetuity. These funds should be placed in an escrow account for use by the designated conservation steward entity. 5–6

Thank you for this opportunity to provide comments. Should you have any further questions, please call me at (909)335-5149.

Sincerely,

Dr. Timothy P. Krantz, on behalf of the Board of Directors,
San Bernardino Valley Audubon Society

Cc: Adam Keats, Center for Biological Diversity

Response to Commentor No. 5
Timothy Krantz, San Bernardino Valley Audubon Society
April 14, 2005

5-1 Although the species referenced were not identified as occurring on the project site, they were identified in the Draft EIR section and biological technical report for the project and determined to have a high potential to occur on the project site. The EIR section and biological technical report stated that surveys for special status plants were inconclusive because they were conducted during an exceptionally dry year, necessitating an additional survey as required by Mitigation Measure 5.8-1a, and identified potential impacts to special status plants as significant.

5-2 Surveys were not conducted this year because the ultimate disposition of the project site has yet to be determined. Focused plant surveys will be scheduled if and when the project is approved by the County of San Bernardino. Mitigation Measure 5.8-1a requires that surveys shall be conducted during a spring with adequate rainfall to ensure proper identification of special status plants on the project site and appropriate mitigation acreage.

5-3 The area designated open Jeffrey pine forest was identified according to topography, soil types, and plant species composition observed during focused surveys in 2002. According to the 2002 Pebble Plain Habitat Management Guide, a point system to qualify pebble plain habitat was developed. To qualify as a pebble plain a given area must possess enough indicator species to attain a score of four points. Strong indicator species, each worth two points, often occur on pebble plains and rarely occur off pebble plains. Weak indicator species, each worth one point, often occur on pebble plains and frequently occur off pebble plains. The project site contains one strong indicator species, silver-haired ivesia, which was restricted to the 0.62 acre of pebble plain habitat mapped. Two weak indicator species, Parish's rock-cress and ash-gray Indian paint brush, were observed within the mapped pebble plain habitat and in scattered patches within the open Jeffrey pine habitat type. Therefore, the 0.62 acre of pebble plain attained the required four points and the area designated open Jeffrey pine forest attained only two points according to the 2002 Pebble Plain Habitat Management Guide point system. Implementation of Mitigation Measure 5.8-1a would ensure that botanical surveys are repeated prior to clearing or grading to more precisely map the concentration of special status plants and habitats. Following surveys, the habitat types and acreages will be revised according to the habitat definitions in the 2002 Pebble Plain Habitat Management Guide and mitigated appropriately at a 3:1 ratio. Furthermore, implementation of Mitigation Measure 5.8-1a requires that a mitigation site is identified prior to any vegetation clearing, grading, or other site disturbance on the project site. Therefore, the project would not be allowed to move forward until a mitigation site is identified and purchased.

5-4 The Draft EIR section and biological technical report identify project-related impacts to bald eagles and their perch trees as significant and unavoidable impacts and significant and unavoidable cumulative impacts.

5-5 Please refer to Response to Comment No. 5-4. Mitigation Measures 5.8-1b and 5.8-1c prohibit development that may occur within the project site and in the individual lots from impacting these trees and their root structures. Mitigation Measures 5.8-1b and 5.8-1c are hereby revised as follows:

5.8-1b Trees identified on Exhibits 3 and 4 of the Bald Eagle Survey Report (Appendix E, see attached) as eagle perch locations shall be preserved in place upon project completion and shall not be removed under any circumstances. Any development that may occur within the project site and in the individual lots must avoid impacts to these trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.

5.8-1c Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed to identify all large trees (i.e., greater than 20-inches in diameter at 4.5 feet from the ground) within 600 feet from the high water line. Trees identified on the project site as having a diameter in excess of 20-inches at four feet from the ground within 600 feet of the shoreline shall be documented and tagged. Any development that may occur within the project site and in the individual lots must avoid impacts to tagged trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.

5-6 Comment is noted. The County will consider the Commentor's opinion and comments during the deliberations on the project.

COMMENT NO. 6

SIERRA CLUB
FOUNDED 1892

SIERRA CLUB
BIG BEAR GROUP

April 15, 2005

VIA FACSIMILE

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Avenue 1st Floor
San Bernardino, California 92415-0182
Attn: Matthew Slowik

RE: "Revised Biological Resources Section of the DEIR for the Moon Camp Development Project/RCK Properties Inc.."

The Big Bear Group of the Sierra Club, representing over 200 members in the Big Bear Valley, appreciates the opportunity to comment on the Revised Biological Resources Section of the DEIR for the proposed Moon Camp Development project in Fawnskin, California.

Our position is that this revised evaluation of the impacts to the biological resources still proves to be inadequate due to its underestimation of the impacts and its suggestion of mitigations that in the past have proven to be ineffective. In recent investigations regarding the mitigations required by the EIR's of completed projects around the Big Bear Valley, it has been shown that these mitigations, especially in the cases of those for bald eagles and for pebble plains habitat: 1) have often not been implemented by the developers; 2) have frequently not been enforced by the lead agencies involved; 3) have done little or nothing to stop the decline of these species throughout the Valley and 4) have been forgotten about over the long term. For the most part, all record of similar mitigations have been buried in the file archives of the lead agencies, including the County, with no steps taken to preserve the information and make certain that future generations of employees receive it or track, monitor and enforce the mitigations into perpetuity. These measures have thus proven to be impractical and ineffective in the mitigation of impacts from the projects. None of this has been accounted for in this revised section or anywhere else in this DEIR with regards to the resulting impacts on the biological resources. 6–1

This new biological resources section completely underestimates the impact on bald eagles in Big Bear Valley and throughout Southern California. The bald eagle population has been in steady decline throughout Southern California and in the Big 6–2

Bear Valley over the past two decades. One highly effective way for populations in this whole region to begin to recover would be for the eagles to once again begin nesting in this region as they had done in the past, prior to the human-caused impacts that drove them away. The north shore of Big Bear Lake is one of the last remaining areas where this nesting may be possible and the development of this project would most likely serve to eliminate that possibility. None of these larger range impacts on the bald eagle have been evaluated in this revised section or anywhere in this DEIR. 6–2

The pebble plains habitats and the montane meadow habitats are both declining throughout the valley, primarily due to human pressures. The actual size of both these habitats on the proposed project site have been severely underestimated. In addition, the relative size to the total of these habitats still remaining has been underestimated, resulting in a severe understatement in the impacts of this proposed project on the total range and viability of these habitats into the future. 6–3

Many sections and statements within the current General Plan for the County of San Bernardino focuses on the goals of maintaining and protecting the existing natural habitats within the County and especially within the Mountain areas. The revised biological resources section of this DEIR fails to evaluate how the adverse impacts that are defined will impact the County's ability to adhere to these goals. 6–4

The Big Bear Group of the Sierra Club finds that this revised Biological Resources section, and therefore the complete DEIR for this proposed Moon Camp project is inadequate and incomplete. In addition, even with the adverse impacts as currently stated in this section, especially regarding the bald eagle, this project should be rejected and the No Project option selected. 6–5

Respectfully submitted,

Bill Nichols
Executive Committee Member
Big Bear Group, Sierra Club

Response to Commentor No. 6
Erv Nichols, Sierra Club
April 15, 2005

6-1 The specialists responsible for preparation of the biological resources section of the EIR indicate that the mitigation measures are feasible as written and should be appropriately implemented by the lead agency. The County, as the lead agency, shall assume responsibility for implementation of the mitigation measures.

6-2 Direct, indirect, and cumulative impacts to the bald eagle have been identified in the Draft EIR as significant and unavoidable. Impacts to nesting bald eagles were not analyzed because bald eagles are not nesting at Big Bear Lake in the existing condition.

6-3 Please refer to Response to Comment No. 5-3.

6-4 The Draft EIR section identified plants considered by the County General Plan as Rare, Threatened, or Endangered. Projects potentially impacting County-listed species must prepare an environmental analysis in accordance with CEQA to determine the significance of impacts on these species. Two plant species identified within the General Plan, Parish's checkerbloom and bird's foot checkerbloom, have the potential to occur on the project site. Impacts on these species were assessed in the Draft EIR according to the presence of suitable habitat. Implementation of Mitigation Measure 5.8-1a would determine specific population impacts and reduce impacts to these species to less than significant levels. Other sections of the County General Plan applicable to the proposed project are discussed in the Land Use and Planning Section of the EIR.

6-5 Comment is noted. Section 7.0 of the Draft and Final EIR address the "No Project" alternative.

COMMENT NO. 7

FRIENDS OF FAWNSKIN
P.O. Box 422
Fawnskin, California 92333
909-866-9682

CENTER FOR BIOLOGICAL DIVERSITY
1095 Market St., Suite 511
San Francisco, CA 94103
415-436-9682

RECEIVED
APR 18 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

April 15, 2005

Sent by FACSIMILE (909-387-3223), hard copy to follow via U.S. Mail

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Avenue 1st Floor
San Bernardino, California 92415-0182

Attn: Matthew Slowik, Sr. Assoc. Planner

RE: "REVISED BIOLOGICAL RESOURCES SECTION OF THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK."

I. INTRODUCTION and SUMMARY

On behalf of the membership of Friends of Fawnskin and the Center for Biological Diversity, we would like to thank the San Bernardino County Land Use Services Department Planning Division for the opportunity to comment on this Revised Biological Section of the Draft Environmental Impact Report for the proposed Moon Camp residential development project, General Plan amendment, land use district change, circulation amendment, tentative tract map and conditional use permit for a boat dock (collectively, DEIR).

Friends of Fawnskin (FOF) represents a membership of over 600 local residents of and visitors to Fawnskin, California, all of whom would be directly and adversely affected by the negative impacts to the biological resources of this area that would result from the development of the proposed Moon Camp project. FOF has been working consistently to maintain and protect the historic small-town, nature-oriented atmosphere of Fawnskin on the north shore of Big Bear Lake. Residents and visitors who have chosen to come to Fawnskin have done so primarily because of the nature-surrounded atmosphere and current character of the town. We feel that it is imperative to the rights of these individuals that the basic essence of this character be preserved. 7-1

The Center for Biological Diversity (CBD) is a non-profit, public interest corporation with over 13,000 members across the country, including southern California and the Fawnskin area. CBD and its members are dedicated to protecting the diverse native species and habitats through science, policy, education, and environmental law.

FOF and CBD continue to be strongly opposed to this proposed Moon Camp development project because, even with the mitigations proposed in this revised biological resources section, this project would continue to have extensive adverse effects on surrounding properties, on the entire community of Fawnskin and on the Big Bear Valley environment as a whole. Especially in the area

of Biological Resources, this project goes against a large number of the goals set for the mountain areas in the County's own General Plan. Though an amendment to the General Plan to change the zoning is proposed, there is no amendment currently proposed to change the general goals in the area of biological and natural resources. In order to maintain those goals and support the existing biological resources at this site and throughout the Big Bear Valley, we support the RL-40 designation of this property as it is currently zoned in the County's General Plan and strongly advocate the maintenance of this designation. From visitor information collected by the Discovery Center, we believe that much of the economic viability of this entire Valley depends on the maintenance of the native habitats and natural surroundings currently in existence. The adverse impacts to those habitats, and especially to the bald eagle, that would result from the development of this proposed project would rapidly trickle down to adversely affect the economic well-being of the entire Big Bear Valley. 7-1

In reviewing this revised Biological Section of the DEIR, FOF and CBD have found it to still be incomplete, inaccurate, and defective. The DEIR fails to adequately evaluate the severe adverse effects of the proposed project and grossly downplays and understates the significant and unavoidable impacts that would be caused should it be approved. FOF and CBD's objections to this proposed project and the inadequacies of this revised Biological Resources section of the DEIR are set forth below. Please include this letter in its entirety as part of our formal CEQA comments to be included in the Environmental Impact Report. In summary, we continue to object to this development project, as proposed, for the following reasons:

II. Biological Resources

The revised Biological Section of the DEIR still has provided an incomplete and inadequate evaluation of the impacts on Biological Resources that grossly underestimates the resulting impacts of this project.

- The Standard Conditions of Approval (SCA-1) does not specify that the replanting of trees must be native trees nor the same type of trees that are being removed. The biological resources section does not evaluate the impact on the wildlife as a whole nor on the individual species of the area for a change in the species of trees that exists on the site. 7-2

- Nothing has been mentioned or taken into account in this revised biological resources section that the bark beetle infestation has long passed its peak and that the removal of the dead trees and logs on the site to reduce the bark beetles could have adverse impacts on the other species in this area. The counterbalance of these has not been evaluated to make recommendations for finding a middle-ground for the long-term health of the area in all conditions. 7-3

- The percentage used to define the pebble plains habitat of this site as a portion of the total in existence has been grossly underestimated. According to the biological resources section itself, the special-status plants associated with the pebble plains habitat "were found to be widespread throughout an approximately 11.8 acre area of open Jeffrey pine forest with an herbaceous layer of Wright's matting buckwheat in the western half of the Project site." There is no scientific evaluation or justification given for not including at a minimum the 11.8 acres nor more accurately the "western half of the Project site" in the calculations for the size of the actual pebble plains habitat. 7-4

- Once again, since the entire "open Jeffery pine forest" as characterized in the document meets the habitat definition of pebble plains and supports special status species across 17.38 acres, the impact is not just 0.69 acres as considered in the analysis, but the entire 17.38 acres. 7-5

- Many of the pebble plains habitat areas in other parts of the Valley have been very recently and very extensively damaged and thus potentially reduced in size. No evaluation has been done on the actual size of the entire pebble plains habitat, and therefore on the actual percentage represented by this proposed development site, with taking into account the large increase in off-road vehicle usage and resulting destruction of the existing habitat. **7–6**

- No scientific justification is given to define 40% rainfall as being a sufficient basis for obtaining an accurate survey of the extent of the pebble plains habitat nor any justification given for surveys being valid with anything less than full and normal rainfall. **7–7**

- No scientific justification is given to define 40% rainfall as being a sufficient basis for obtaining an accurate survey of the extent of the montane meadow habitat nor any justification given for surveys being valid with anything less than full and normal rainfall. **7–8**

- Since it would be difficult if not impossible to find a willing seller of sufficient acreage of pebble plains and associated rare plant habitat to in any way mitigate the loss of the actual size of these habitats at the proposed project site, this mitigation measure (paragraph 2 of 5.8-1a) is impractical and inadequate. **7–9**

- No mitigation measures have been defined to make up for the loss of montane meadow habitat with the development of this proposed project. **7–10**

- No evaluations have been done to define how much of the total montane meadow habitat in the Valley would be lost with the development of this proposed project. **7–11**

- The special status plant species listed on page 5.8-48 of the revised biological resources section that are likely to exist at the site but that were not detectable during the surveys have not been adequately evaluated nor their potential loss accounted for in this DEIR. Since their numbers have not been determined, no determination as to the full impact to their total populations could have been determined, nor are there any requirements set for making up for their loss once their actual numbers and extent of range have been determined. **7–12**

- Given all of the above points, the mitigation measures defined in 5.8-1a are grossly inadequate and would not serve to reduce impacts to a less than significant level. **7–13**

- Since the extent of the pebble plains habitat has been inadequately evaluated and grossly underestimated, the evaluation of the potential impact to the special-status Andrews' marble butterfly is inadequate and could underestimate the significance of the impacts on this species. **7–14**

- The analysis fails to evaluate the loss of a significant portion of the shoreline habitat for all the species that could be impacted, including not only shore-feeding species, but all species that use this portion of the shoreline for access to the lake. **7–15**

- The mitigations proposed to protect the bald eagle habitat as proposed continue to be impractical and ineffective. Similar mitigations in other parts of the Valley have often not been enforced or regulated so that they, in the end, proved to be neither practical nor effective. **7–16**

- This revised section fails to evaluate the adequacy of the special-status wildlife mitigations on the basis that similar bald eagle mitigations have been done in prior developments in the Big Bear Valley and when the mitigations were implemented, the bald eagle numbers have been significantly reduced over the past two decades, thus rendering the mitigations totally inadequate. 7-17

- Once again, the potential removal of additional trees to support Section 5.3-1c mitigation for a 100-foot fuel modification is not analyzed anywhere in the Biological Resources section. 7-18

- The DEIR still fails to include in the biological resources analysis the impact to wildlife based on increases in road-kill from the increased traffic nor from the proposed highway realignment. 7-19

- The evaluation of impacts to bald eagles fails to take into account that the eagles now can see the shoreline from the trees identified as bald eagle perches. There is no mention nor evaluation of the increased impacts when the views from those perch trees is degraded extensively by the visually obstructive intrusion of homes built between the trees and the shoreline. 7-20

- No mention nor evaluation has been done on the larger-range impacts to the entire population of Southern California wintering bald eagles. The bald eagle numbers in Southern California have been declining in spite of what's happening in other areas of the country. One of the only potential ways for this population to begin recovering is to increase the chances of these populations actually nesting in Southern California. This habitat on the north shore of Big Bear Lake is some of the last remaining likely areas for this nesting to occur and thus, this proposed project will very likely negatively impact the chances for overall recovery of the bald eagle populations in Southern California. 7-21

- No evaluation has been done on whether the drought in this area could have affected the existence of the wildlife on this site and whether more wildlife would be likely to be found at the site during years of normal rainfall. Therefore, the evaluation of the impact on all wildlife, including but not limited, to the yellow-blotched salamander, the silvery legless lizard, the southern rubber boa, the San Bernardino Mountain Flying Squirrel, and all species of bats is inadequate and potentially understated. 7-22

- The adverse impacts on the biological resources that would result from the development of this project would spread out to affect other arenas, such as the economy of the valley and the economic viability of its current dependence on tourism. None of these impacts have been evaluated in this section or throughout the remainder of the DEIR. 7-23

This revised biological resources section analysis continues to be inaccurate and inadequate and grossly understates the level of significance of the impacts regarding wildlife and plants that would be caused by this proposed project. It especially continues to underestimate the significant impacts on bald eagles and both the pebble plains and the montane meadow habitats. 7-24

III. CONCLUSION

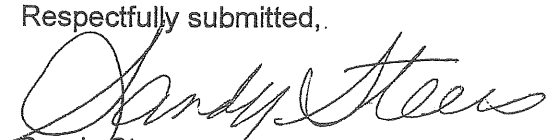
Friends Of Fawnskin and CBD hereby incorporate by reference any and all comments made regarding this project, even if made in the past or future, in order to enforce the non-discretionary requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). FOF and CBD have raised many critical issues in this response, but our concerns are not limited to only these specific items. Further, since a section of this DEIR was revised, the entire document must be circulated once again so that the changes and how they apply 7-25

from one section to another can be properly evaluated and the public and the decision-makers can be properly informed prior to making any decision on this project, as required by law. 7-25

We again formally request timely notification in advance of all meetings, documents, and decisions regarding this proposed project. 7-26

The Revised Biological Resources section of the Draft EIR, and thus the DEIR as a whole, for the proposed Moon Camp Project currently in circulation is incomplete, inaccurate and defective and must be rejected in its present form. It has failed to adequately assess the level of significance of the adverse impact on biological resources. Furthermore, multiple significant impacts continue to understate and sugar coat the project in a thinly-veiled attempt to convince the Board of Supervisors to approve this project with overriding considerations. The project, on the basis of the present proposal, is so entirely contrary to the guidelines of the County's General Plan and the best interest of the tax-paying public that it warrants nothing less than a categorical denial. We urge the Board to carefully evaluate this project and select the No Project Alternative in the interest of the Public Trust. 7-27

Respectfully submitted,



Sandy Steers
for the Friends Of Fawnskin
and Center for Biological Diversity

Response to Commentor No. 7
Sandy Steers, Friends of Fawnskin
April 15, 2005

7-1 Comment is noted. Section 7.0, Alternatives to the Proposed Project, includes a "No Project/No Development" alternative (RL-40) and an additional range of alternatives, concluding with the environmentally superior alternative.

7-2 Trees will be "replanted" on the site at a 2 to 1 ratio per the San Bernardino County Plant Protection and Management Ordinance requiring planting of trees of the same species removed. Direct and indirect impacts on wildlife are discussed beginning on page 5.8-54 of the Recirculated Biological Resources Section, under the heading "Wildlife Impacts/Indirect Impacts."

7-3 The impact analysis considered direct impacts to 61.87 acres of the 62.56 acre project site, which includes all native and non-native vegetation types, including developed areas. These impacts included the removal of all habitat on the project site, including dead trees and logs, and took into consideration impacts on wildlife dependent on the habitat provided by them.

7-4 Please refer to Response to Comment No. 5-3.

7-5 Please refer to Response to Comment No. 5-3.

7-6 Please refer to Response to Comment No. 5-3.

7-7 According to the Western Regional Climate Center (WRCC 2005), the Big Bear Lake area receives an average of 21.99 inches of precipitation annually, 13.63 inches or 60 percent of which is received by May when plant surveys would begin on the project site. Forty percent or 8.8 inches was considered a minimum average rainfall threshold at which surveys would be considered within an acceptable range. Mitigation Measure 5.8-1a of the Draft EIR has been updated for the Final EIR as follows:

5.8-1a	~~Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on listed special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented.~~ ~~The project applicant shall pay compensation for the loss of special status botanical resources identified on the project site by the survey by funding the purchase and management of off-site habitat through contributions to a fund established by the California Wildlife Foundation~~

~~on behalf of the CDFG. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development).~~

~~If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the project applicant is responsible for the mitigation of a minimum of 11.8 acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the federally-listed Threatened ash-gray Indian paintbrush (i.e., would be required to fund the purchase of 35.4 acres of offsite habitat from the California Wildlife Foundation if the agreed mitigation ratio is 3:1).~~

Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys shall focus on special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations shall be mapped and the size of the populations accurately documented. Pebble plain habitat acreages will be recalculated following the survey using criteria established by the Habitat Management Guide for Pebble Plain Habitat on the National Forest System (2002).

Should avoidance/retention on-site of the 4.91 acres of Pebble Plain habitat in permanent open space under a Conservation Easement Agreement not occur, the Project Applicant shall pay compensation for the loss of special status botanical resources identified on the project site during the survey by funding the purchase, establishment of a conservation easement, and management of off-site habitat within the conservation easement by an entity approved by the CDFG. Off-site habitat containing the same species as those identified within resources impacted by the proposed project shall be purchased at a ratio of 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development). Prior to the initiation of clearing or grading activities on the project site, the conservation easement will be established, the management entity will be approved by the CDFG, and a non-wasting endowment will be established for the monitoring and management of the preservation site by the management entity in perpetuity.

If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the Project Applicant is responsible for mitigating impacts to a minimum of 11.8-acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the Federally-listed Threatened ash-gray Indian paintbrush. As such, the applicant would be required to fund the purchase and maintenance of 35.4-acres of offsite pebble plain and open Jeffrey pine forest habitat that contains special status plant species, including Ash-gray Indian paintbrush and others known to occur on the site.

7-8 Please refer to Response to Comment No. 7-7.

7-9 Implementation of Mitigation Measure 5.8-1a requires identification of a mitigation site identified prior to any vegetation clearing, grading, or other site disturbance on the project site. Therefore, the project would not be allowed to proceed until a mitigation site is retained.

7-10 Vegetation type acreages would be recalculated following focused plant surveys in accordance with Mitigation Measure 5.8-1a. Therefore, Mitigation Measure 5.8-1a would mitigate for the loss of Montane Meadow habitat on the project site.

7-11 According to the Southern California Mountains and Foothills Assessment by the Forest Service (U.S. Department of Agriculture 1999), there are approximately 55,446 acres of montane meadow habitat in Southern California, 38 percent (21,070 acres) of which occurs on public lands. Approximately 4.4 acres of lake shoreline on the project site has the potential to support montane meadow habitat. The loss of 4.4 acres on the project site or approximately 0.00008% of the total acreage known to exist in its range would not likely be considered significant. However, because montane meadow is considered a special status vegetation type, it would be mitigated at a 3 to 1 ratio in accordance with Mitigation Measure 5.8-1a.

7-12 Impacts to special status plants were considered by assuming their presence on the project site and evaluating impacts to the total acreage of suitable habitat for these species on the project site. Mitigation Measure 5.8-1a would reduce impacts to these species to a less than significant level.

7-13 The lead agency will make a determination as to the adequacy of Mitigation Measure 5.8-1a after consideration of the Draft EIR section and Responses to Comments.

7-14 The Andrews' marble butterfly is not currently listed or proposed for listing as a Threatened or Endangered species or CDFG Species of Special Concern. This species is known to occur in pine and mixed conifer forests, particularly open forest areas, above 5,000 feet elevation. As discussed in the draft EIR section, there are approximately 58,526 acres of Jeffrey pine forest in the San Bernardino Mountains. Furthermore, there are approximately 124,652 acres of mixed conifer forest in the San Bernardino Mountains. Therefore, within the San Bernardino Mountains there are approximately 183,178 acres of montane conifer forest containing potential habitat for the Andrew's marble butterfly and its host plants. It is not anticipated that

impacts to approximately 54.91 acres of Jeffrey pine forest and 0.69 acre of pebble plain would result in a significant impact to this species. Furthermore, implementation of Mitigation Measure 5.8-1a would ensure that impacts to pebble plain habitat are mitigated to a level considered less than significant.

7-15 General wildlife impacts, including loss of foraging habitat, are discussed in the Recirculated Biological Resources Section, under wildlife impacts on page 5.8-52 and impacts to lake access are discussed under wildlife movement impact 5.8-4 on page 5.8-59 and 5.8-60.

7-16 Please refer to Response to Comment No. 6-2.

7-17 Please refer to Response to Comment No. 6-2.

7-18 Please refer to Response to Comment No. 7-3.

7-19 In the existing condition, State Route 38 represents a hazard to wildlife crossing to access the Big Bear Lake as a water source. There are several blind curves that represent a greater hazard than the proposed project improvements to State Route 38. The proposed project would result in an increase in traffic on State Route 38 from vehicle trips to and from the proposed development. However, the proposed project would reduce the amount of wildlife and available habitat on the project site, thereby resulting in a reduced likelihood for vehicle strikes on State Route 38 and on streets interior to the project. Additionally, the speed limit on State Route 38 would not be changed with project implementation.

7-20 It is not anticipated that construction of homes near the shoreline would affect bald eagle views of Big Bear Lake from perch sites. Nonetheless, direct, indirect, and cumulative impacts to the bald eagle are considered significant and unavoidable by the Draft EIR analysis.

7-21 Please refer to Response to Comment No. 6-2.

7-22 The project site is located adjacent to the Big Bear Lake. It is unlikely that the species mentioned, or their prey or food items would move away from such a large water source during drought conditions.

7-23 As stated in Section 15131(a) of the CEQA guidelines, economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

7-24 The Draft EIR identifies impacts to bald eagle as significant and unavoidable. Impacts to pebble plains are considered significant; however, implementation of Mitigation Measure 5.8-1a would reduce impacts to a level considered less than significant. Impacts to montane meadow habitat, if determined to be on the project

site would also be mitigated by implementation of Mitigation Measure 5.8-1a. Please refer to Response to Comment No. 7-10.

7-25 In accordance with Section 15088.5(c), which pertains to recirculation requirements, if the revision is limited to a portion of the EIR, the lead agency need only recirculate the chapters or portions that have been modified. In the case of this EIR review for the proposed Moon Camp Project, the revisions to the Draft EIR involved exclusively the Biological Resources Section.

7-26 Comment is noted.

7-27 Comment is noted. Section 5.1, *Land Use and Relevant Planning*, of the Draft and Final EIR includes a comprehensive review of land use and policy affects associated with the County General Plan.

SAN BERNARDINO VALLEY AUDUBON SOCIETY
P.O. Box 19973, San Bernardino, CA 92423

April 15, 2005

Matthew W. Slowik, Senior Associate Planner
COUNTY OF SAN BERNARDINO
Land Use Services Department, Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182
FAX (909) 387-3223

By FAX and U.S. Mail

RE: REVISED BIOLOGICAL RESOURCES SECTION
Draft Environmental Impact Report *for the* **MOON CAMP Development Project / RCK Properties Inc.; General Plan Amendment -Official Land Use District Change from BV/RL-40 to BV/RS-7200 and Amendment to County Circulation Element for Realignment of North Shore Drive; Tentative Tract Map #16136; and Conditional Use Permit for a Boat Dock.**

Dear Mr. Slowik,

The *San Bernardino Valley Audubon Society* appreciates the opportunity to comment on the Revised Biological Resources Section of the Draft Environmental Impact Report referenced above for the Moon Camp Development Project and Boat Dock in Fawnskin, which are dependent upon a special General Plan Amendment for increased density in land use designation and an amendment to the County Circulation Element for realignment of the scenic highway.

The San Bernardino Valley Audubon Society represents approximately 2000 citizens living in the Inland Empire. In addition to our members who actually reside in the mountain region, all of us look to the San Bernardino National Forest as a monumental public asset, a one-of-a-kind forest sanctuary that offers refuge, recreation and spiritual renewal to everyone who wishes to enjoy its rare and valuable alpine qualities. When actions are proposed that threaten to sacrifice these advantages unwisely or unjustifiably, we feel a strong obligation to speak out on behalf of the general populace, especially when any proposal --such as the present case-- contains disproportionate County giveaways that unduly favor private gain at public expense. 8-1

The analysis provided in the Revised Biological Resources Section of the Draft Environmental Report reveals a prime example of the kind of development proposal where the County is being asked to sacrifice major public values in order to elevate private interests and private gain over and above reasonable County guidelines, which were established essentially to

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avoid such actions. The purpose stated in the Introduction of the Revised Biological Resources Section for the inclusion of additional biological information is that the "revisions are intended to clarify cumulative impacts to the bald eagle species and present modifications to mitigation measures." In clarifying the overall effect of the proposed project on the bald eagle species in the Big Bear Valley, the conclusion of the report is that the project would result in "significant and unavoidable impacts" to bald eagle populations, for which no offsetting mitigation can be provided. Given the importance of the Bald Eagle in the Big Bear Valley both biologically and economically, this is tantamount to saying that the project would be an extremely bad idea.

It is further stated that, "If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA." In past instances of biologically detrimental development proposals in the mountain area, where significant unmitigable impacts were present, the County has employed the Statement of Overriding Consideration to substitute housing needs and economic benefits as tenuous justifications to override the particular significant biological impacts.

However, recent fires, floods and other hazards have shown that excessive housing in the mountains does not equate to the same social benefits that ordinary urban planning or an urban-oriented mindset might generally assume in the instance of similar growth inducing situations in the flatlands. On the contrary, more housing is counter-productive to public safety. No longer can it be considered justifiable to sidestep critical biological resources on the claim that social, housing or economic benefits override the public value, the resources value or the economic value of the bald eagle habitat in the Big Bear Valley. The protection of natural resources on this site is clearly more in keeping with the highest public interest. This is especially true in the present case where a General Plan Amendment aimed specifically at increasing allotted densities would be necessary in order to implement the proposed project, even though the majority of the adjacent land is National Forest and lake frontage, fully within the viewshed of a scenic highway.

8–1

The Bald Eagle has become a major attraction and a prominent symbol for the Big Bear area as well as a critical indicator species of the overall biological health and integrity of the forest and alpine lake environment. Unwarranted commercial ventures that actively confer special advantages to the applicant at public expense ought not to be allowed in cases like this where they clearly jeopardize prominent resources.

As was pointed out in our prior comments of May 17, 2004, increased development in the Big Bear Valley has corresponded with a simultaneous decline in the population of wintering Bald Eagles that inhabit the area. In addition to being the national bird, the bald eagle has also come to symbolize the unique wildlife values of the Big Bear Lake area in the San Bernardino National Forest. Beyond its importance as a threatened species, the presence of the Bald Eagle in Big Bear has become a famous attraction for the visiting public, widely featured in a variety of publications and media exposure that confer a tremendous level of preciously high-profile advertising of this popular tourist destination. Such attention is of considerable benefit to the local economy that prospers from the prominence of the surrounding National Forest and the integrity of its wildlife. The Forest Service Discovery Center on the north shore is the main

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visitor center for the local mountains. Eagle tours are the primary attraction in winter. The health and sustainability of the Bald Eagle is a critical factor for the overall natural resource values of the National Forest in the Big Bear Lake area.

The Revised Biological Resources Section strongly confirms that the Moon Camp site is a highly significant roosting and perching habitat for the remaining bald eagle population in the area. In fact the report stresses that the "proposed project contains some of the most utilized bald eagle roosting and perching habitat in the Big Bear Valley." But the revised assessment also points out that the proposed project, which is entirely dependent upon a discretionary approval by the County of a preferential zoning change, would have an extremely adverse effect on the Bald Eagle, which could not be mitigated. The quantity of trees that would need to be removed for the extensive building and road construction proposals would severely compromise the viability of the existing habitat and further compound the factors contributing to the significant population decline of the Bald Eagle in Big Bear Valley.

Therefore we continue to strongly encourage that the County Planning Department recommend that the project be denied as not conforming to the unique values of the site, particularly the extraordinary presence of the magnificent Bald Eagle as one of the most exceptional and irreplaceable natural resources of the region. It would be a tragic loss if the largest population of wintering bald eagles in Southern California were allowed to dissipate due to unwarranted projects like this.

8–1

The Bald Eagle is certainly a prime example of the kind of natural resource that the County General Plan fully intended to protect. Over 15 years ago the General Plan recognized on Page 11-C1-2 that, "In the Mountain region, many plant and animal species, including Bald and Golden Eagles, are losing habitat to residential land use along lake shores." Wildlife values are specifically highlighted in the General Plan on page 11-C5-57 under the Preservation of Natural Resources Section of the Open Space Element as having a collection of positive factors such as aesthetic, recreational, ecological, educational and scientific values as well as economic benefits, insofar as the wintering population of the Bald Eagle in particular is a popular tourist event in the Big Bear Valley. Also the San Bernardino Mountains as a whole are considered an "Area of Biotic Significance" (page 11-C5-66) and in particular all perennial and intermittent ("Blue-line") streams, lakes and reservoirs, conifer forests and large mammals and raptors are specifically identified as being key natural resources (pgs. 11-C5-70, 73). It is clear that the overall context of the mountain environment requires special attention to sustain a whole system of natural resources.

The supplemental Biological Resources Section of the DEIR has been helpful in its expanded assessment of these unique qualities and considerations as they relate to the proposed Moon Camp development project. But it is increasingly apparent to the San Bernardino Valley Audubon Society from monitoring development trends in the San Bernardino Mountains over the past decade that the full protection of the County General Plan pertaining to natural resources needs to be more strongly invoked and more strategically reinforced, if the highest and best attributes of the local National Forest and its exceptional biological resources are to be adequately sustained as a regional treasure into the rapidly urbanizing future. It is also important

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that applicants such as the Moon Camp proponents realize at the earliest possible stage that inappropriate projects ought not to be proposed in the first place.

The County General Plan fully recognizes many of the critical challenges inherent in protecting natural resources:

> These resources generally are not hardy nor capable of withstanding the adverse effects of increasing urbanization. Understanding these resources requires an understanding of certain principles. These include the concepts of: carrying capacity, threshold levels of impact, renewable versus nonrenewable kinds of resources, ecological viability, and long-term versus short-term deleterious effects.

8–1

> Natural resources are distinctly different from other concerns normally dealt with in the planning process because these resources are exhaustible and can be permanently damaged. In order to ensure the continued ability of these natural resources to function in their supportive roles in maintaining the quality of life for the urbanized portions of the County, it is crucial to identify and implement strong definitive actions to assure their long term survivability. Without strong direction and controls placed upon certain lands within the County, undesirable effects will result in:
>
> -- Extinction of species
> -- Depletion of groundwater aquifers
> -- Consumption of nonrenewable resources
> -- Loss of interpretive data
> -- Conversions of natural open space

There are numerous goals and policies of the General Plan that fully emphasize these biological and natural resource priorities. A survey of several of these policies strongly illustrates the special value and protections outlined in the General Plan:

Natural Resources Goals (pg. 11-C-2)

C-1 Natural Resources are a necessity to the quality of life within San Bernardino County and it is desirable to maintain them to the greatest extent possible.

8–2

C-2 Certain scarce natural resources are best managed for preservation. These include biological resources, cultural resources, air quality, groundwater supply and quality, and open space.

C-4 Maintenance of the natural resource base of the County requires prudent stewardship in coordination with appropriate agencies and interested groups.

C-6 Preserve rare and endangered species and protect areas of special habitat value.

C-7 Conserve populations and habitats of commonly occurring species.

C-8 Establish plans for long term preservation and conservation of biological resources.

Natural Resource Preservation Goals (pg. 11-C5-78)

C-34 Conserve as many of the County's natural resources as possible and ensure the protection and preservation of traditional regional park values for the benefit of future generations.

C-35 Provide and preserve large open-space areas for both active and passive resource values.

C-36 Include, protect and manage areas having natural values of regional significance.

C-38 Protect the alpine character and environment.

C-39 Protect the forest watersheds.

C-41 Throughout the County, protect natural slopes and topography.

Location, Distribution and Intensity of Land Uses Goals (pg. 11-D6-4)

D-47 Provide a compatible and harmonious arrangement of land uses in the rural area and encourage the conservation of natural and cultural resources for the benefit of residents and visitors.

D-49 Determine what the land is best suited for, match man's activities to the lands' natural suitability, and minimize conflict with the natural environment.

8-2

Natural Resources –Biological Policies/Actions (pg. 11-C1-4)

BI-4 Because the quality of life is related to the variety and abundance of all species, commonly occurring species shall be conserved. The following policies shall be incorporated into the conditions of approval for all proposed discretionary land use proposals:

d. Restrict encroachment of incompatible land uses on natural areas, including drainage courses and open space areas shown on the Resources Overlay.

General Open Space Policies/Actions (pg. 11-C5-7)

OR-1 Because preservation of open space lands will be facilitated through the application of land use standards, the County shall implement the following actions:

a. Utilize appropriate land use categories on the Land Use maps to provide for uses which respect open space values. Land Use districts appropriate for various types of open space preservation include: Agriculture (AG), Floodway (FW), Resource Conservation (RC), Institutional (IN).

b. Develop and apply development policies/standards to support retention of open space lands by: requiring large lot sizes, high percentage of open space or agricultural uses, and clustering.

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c. Utilize the Hazard and Resources Overlay Maps to identify areas suitable or required for retention as open space. Resources and issues identified on the Overlays which indicate open space as an appropriate use may include: **flood, fire, geologic,** aviation, noise, cultural, prime soils, **biological, scenic resources,** minerals, agricultural preserves, utility corridors, water supply and water recharge.

OR-2 Because the County desires to protect open space lands, and since the County has a unique ability to implement open space programs countywide, the County shall acquire and develop public open space through the establishment of a long-term funding source for land purchase/lease and open space operations.

Open Space Action Programs: Implementation and Funding (pg. 11-C5-8)

OR-3 Because implementation of the open space policies and programs in this Element will require the application of specific policies and action programs and the availability of funding and other implementation mechanisms, the County shall:

d. Prepare a report outlining the economic effects of open space, focusing on potential tourism revenues, the effect of open space on adjacent property values, and the relative costs of providing open space management or urban services for a site.

8–2

Natural Resource Preservation Policies/Actions (pg. 11-C5-79)

OR-15 Because the County desires to protect and preserve natural habitat, areas shown on the Resources Overlay as "Policy Zone" and "Wildlife Corridors" shall be targeted for ministerial and discretionary actions, including purchase of some lands, in support of preserving the natural features and habitat present.

OR-17 Because preservation of natural systems requires the establishment of habitat areas larger than can be provided within individual developments, and since many habitat areas are at risk of being lost to urban encroachment, the County shall seek to establish a publicly owned open space system, purchasing land or development rights or transferring development rights or density, where necessary, to prevent development of important open space areas.

OR-18 Because preservation of natural resources cannot be accomplished only through the use of publicly owned land, the County shall apply the following policies to development and construction proposals on private lands.

a. Require that private lands which exhibit unique features, as identified on the Resource Overlay Map or discussed in this Open Space Element, shall maintain those features. Compensation by allowing the transfer of development rights will be the preferred mechanism for accomplishing this goal. "Unique features" may include *significant topographic features, ridgelines, habitats for threatened and* endangered species, and habitats of limited dispersion in the County.

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b. Encourage donation or exchange of lands with sensitive biota resources (including, but not limited to, areas shown on the Resources Overlay) to non-profit environmental organizations or responsible agencies (USFS, County, the Nature Conservancy, etc.).

c. Promote common-interest Planned Developments requiring open space and allowing transfer of development rights.

d. Apply the Resource Conservation Land Use District in areas of public and private open space which by its location, access limitations, natural resources, terrain or scenic qualities is suited for low intensity use.

e. Direct growth away from areas containing fragile or erosion-prone soils, especially those which support natural habitats.

OR-20 Because preservation of threatened and endangered species requires the preservation of naturally occurring ecological systems containing plants and animals not considered threatened or endangered, the County shall include in its review of all development projects the total habitat value of a site, rather than simply the presence or absence of these species.

OR-24 Because preservation of rare, threatened, or endangered species depends on the preservation of habitat which supports populations of these species, the County shall implement the following policies:

8–2

a. Seek to protect and conserve rare or endangered flora and fauna with limited or specialized habitats as well as common habitats necessary to support these species.

d. Seek to provide protection and management to maintain habitat values where protection of natural areas and endangered species is not provided by another agency.

e. Review land use designations to ensure that planned land uses provide adequate protection for natural areas in areas containing known or potential biotic resources or designated as open space zones, corridors or active trail alignments on the Resources Overlay. This policy shall also apply to areas adjacent to zones, corridors or active trail alignments.

OR-25 Because the development of private lands can adversely affect the management strategies of the federal agencies which administer public lands within San Bernardino County, the County shall apply the following policies:

a. Support the transfer of private inholdings into public ownership through appropriate mechanisms to reduce "checkerboard" ownership.

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b. Review the planning documents of the public agency to determine the intensity of uses allowed on surrounding public lands when examining private land uses which are surrounded by public lands.

OR-27 Because preservation of some natural resources requires the establishment of a buffer area between the resource and developed areas, the County shall review the Land Use Designations for unincorporated areas within ten (10) miles of any state or federally designated scenic area, national monument, or similar area, to ensure that sufficiently low development densities and building controls are applied to protect the visual and natural qualities of these areas.

OR-28 Because preservation of natural resources is a goal of the County, the County shall support land use and landscape strategies and standards which protect wildlife habitats and important vegetation.

Land Use Policies/Actions (pg. 11-D6-5)

LU-1 Because it is essential to locate new development in areas where the economic strength derived from agriculture, petroleum, rangeland or mineral resources is not impaired and in order to ensure that the value of the other resources which exist in the county is not diminished, the following policies/action shall be implemented:

8–2

f. Enact and enforce regulations which will limit development in ecologically sensitive areas such as those adjacent to river or streamside areas, (as shown on the Overlay maps) and hazardous areas such as flood plains, steep slopes, high fire risk areas and geologically hazardous areas.

g. Preserve and encourage the management of suitable land for greenbelts, forest, recreation, flood control, adequate water supply, air quality improvement, habitat for fish, wildlife and wild vegetation.

LU-10 Because the County wants to minimize land use conflicts between the County and other agencies that have jurisdictional control over lands located within the County, and because the County wants to cooperate and coordinate with adjacent municipalities and other regional agencies to address regional problems such as traffic congestion, air pollution, water quality, waste management and job/ housing imbalance, the following policies/ actions shall be implemented:

b. Solicit comments from the military and other Federal and State agencies that control land in the County on projects which are proposed near their facilities, as described in sub-policy (d) below.

Mountain Policies/ Actions
LAND USE/ GROWTH MANAGEMENT (pg. 111-C-6)

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--The county shall regulate the density and configuration of residential development along the shore of all mountain lakes in order to protect their scenic qualities.

Bear Valley Policies/ Actions
Natural Resources BIOLOGICAL (pg. 111-C-14)

--Designate and protect unique habitats supporting rare and endangered species.

--Adopt a Biotic Resources overlay, and utilize the "Sensitive Biota Resources Management Plan" and related "target areas" as community (conservation) standards.

--Utilize the Forest Conservation Community Standards to distinguish between eagle perch trees and hazard trees relative to permitted removal.

8–2

OPEN SPACE/ RECREATION/ SCENIC (pg. 111-C-17)

--Because the Mountain region contains special issues and opportunities, as well as significant open space resources, the following directed policies shall apply:

The County shall encourage conservation and sound management of the mountain forest character and natural resources, including water, streams, vegetation soils, and wildlife.

All of the citations above illustrate how inconsistent the proposed project is with the biological guidelines of the County General Plan. On the other hand the currently designated zoning of one unit per 40 acres for the site is far more consistent with the intent of the General Plan as well as the best interest of the general public and the proper stewardship of the unique and valuable biological resources. The existing land use designation is decidedly more appropriate and ought not to be changed. The additional fact that the supplemental Biological Resources Section of the DEIR does not propose any off-site mitigation such as a conservation easement or offsetting purchase of alternative bald eagle habitat sadly indicates that no other bald eagle habitat on private land remains in the Big Bear Valley. This is a particularly disturbing fact, because it suggests that existing bald eagle habitat on private land in the mountains has been all but diminished to an absolute minimum. The further fact that the species population is declining in the Big Bear Valley indicates that prior mitigations have been insufficient and ineffective. If the guidelines of the General Plan are to be taken seriously and viable protection is to be afforded to the Bald Eagle in the San Bernardino Mountains, then the proposed Moon Camp project must be resolutely rejected. Such a conclusion is made even more emphatic by the fact that the bald eagle habitat on the Moon Camp site is judged by the biological assessment to be of distinctively superior and irreplaceable quality.

8–3

The often dismissive conclusions of the Revised Biological Resources Section of the DEIR regarding the extent of significant adverse impacts on various species and habitats also must be counterbalanced against the extremely narrow context of the rather hair-splitting legal definition of "significance criteria," which was used in determining what would be considered "significant". The statement on page 5.8-45 is an example:

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> "Impacts are sometimes locally adverse but not significant because, although they would result in an adverse alteration of existing conditions, they would not substantially diminish or result in the permanent loss of an important resource on a population- or region-wide basis."

We interpret this to mean that only the most extreme criteria were used as a basis to determine whether an impact was "significant" or not, i.e. whether the impact represents "the permanent loss of an important resource." Using only "permanent loss" or "substantially diminish" (presumably to the point of non-sustainability) as the criteria of "significance" seems to be highly unreasonable. This leads to several conclusions that we would dispute, because higher standards of local criteria ought to have been applied. On page 5.8-14 the study states that, "As defined above, the Project site does not contain wildlife crossings or corridors." Under the section on Wildlife Movement, the report concludes that the project "would result in reduced connectivity between Big Bear Lake as a water source to the contiguous open spaces on and to the north..." and "would result in increased traffic on the project site by residents that would further impede movement of terrestrial wildlife currently crossing the site and Highway 38." Yet the final judgment is: "Although this impact is considered locally adverse, it is not considered significant because the impact does not substantially affect a regionally important wildlife movement corridor." Such dismissals of local impacts contradict admonitions in the County General Plan to better protect common wildlife and encourage restoration of corridors (see C-7 and OR-20 cited above). It is also the case that such casual dismissals of locally adverse impacts can lead later on to serious repercussions in adverse cumulative effects, which all too often have gone overlooked by equivalent short-sightedness in other projects. The total loss of deer fawning habitat in Running Springs is one example. Another is the prior underestimation of overall fire danger in the mountain area, which has resulted in a costly and worsened public safety hazard from the excessive urban-wildland intermix. 8–4

It is clear from the biological report that there really are many additional significant adverse impacts from the proposed project that simply were not considered "significant" by virtue of the minimalist definition used in this assessment. As stated on page 5.8-55: "The loss of habitat, loss of wildlife, wildlife displacement, and habitat fragmentation that would result from construction of the proposed Project would not be considered significant because these impacts would not substantially diminish habitat for wildlife in the region nor reduce any specific wildlife populations in the region to below self-sustaining numbers." Similar kinds of conclusions must have been used on previous projects that have now led to the present critical decline in the bald eagle population. We consider this to be a serious flaw in the report in erring unduly on the side of devaluing biological resources and underestimating cumulative impacts to the point where unsustainable numbers seem to be encouraged rather than strategically avoided. 8–5

It is apparent from the guidelines of the County General Plan that the County and the local general public recognize substantially higher standards of significance than were used in the biological assessment. Given this rather stilted bias in the report, it is even more compelling to realize that the conclusions of the study still firmly establish that there would be extensive and major adverse impacts resulting from the approval of the proposed project. 8–6

In regard to various mitigations proposed for impacts to special status plants and vegetation types as well as nesting raptors and jurisdictional waters, we find that most of the proposals are conscientious and sound with the exception of basing future plant studies on minimal criteria of 40% annual rainfall. This figure appears to be arbitrarily and inappropriately low. However, the overall dependence of this project upon extensive mitigations serves to further underscore the inescapable fact that the project itself is heavily burdened with excessive adverse impacts. The preponderance of adverse impacts once more argues forcefully for denying any change to the County General Plan that would unwisely condone increased densities on this site. 8–7

The extraordinary amount of volunteer time, effort, dedication, research and consultation with experts on the part of local citizens that has been marshaled to confront the inappropriate proposals of the Moon Camp Project is indicative of the unacceptable level of adverse impacts that the project threatens to force upon the community and the public. The County needs to recognize the tremendous amount of time, expertise and expense that has been invested by the public in defending itself against the Moon Camp proposal. Certainly the sum is at least equivalent to any investment made so far by the applicant of the project. We hope that such a prodigious effort and demonstration of citizen concern will make it sufficiently apparent to the County Planning Department that the most appropriate decision must be an explicit denial of the proposal. In respect to the biological resources, maintaining the status quo in the current land use designation is clearly in the best interest of the public as well as for the Bald Eagle, the entire range of wildlife habitat, the overall forest, the rare plants and for the important economic benefits that derive from each of these valuable natural resources. 8–8

For all of the above reasons, the San Bernardino Valley Audubon Society strongly encourages the County Planning Department to recommend denial of the proposed Moon Camp Project. We thank you for your consideration of these comments. 8–9

Sincerely

David Goodward

David Goodward
Conservation Chair

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Response to Commentor No. 8
David Goodward, San Bernardino Audubon Society
April 15, 2005

8-1 Comment is noted and refers to the San Bernardino County Policy provisions which have been addressed in Section 5.1, *Land Use and Relevant Planning*, of the Draft and Final EIR.

8-2 Please refer to Response to Comment No. 8-1.

8-3 Please refer to Response to Comment Nos. 5-3 and 7-1. For the bald eagle, avoidance through retention of eagle perch trees is likely to be more successful than any attempt to recreate/replace some form of eagle habitat elsewhere. Due to unknowns as to how successful the avoidance approach would be, the conclusion of significance for impacts is accurate as presented in the EIR.

8-4 The full text of the paragraph on page 5.8-46 is provided as follows:

> "An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would substantially diminish, or result in the loss of, an important biological resource or those that would obviously conflict with local, State or Federal resource conservation plans, goals, or regulations. Impacts are sometimes locally adverse but not significant because, although they would result in an adverse alteration of existing conditions, they would not substantially diminish or result in the permanent loss of an important resource on a population- or region-wide basis."

This discussion describes the application of the Section 15065(a), *Mandatory Findings of Significance*, of the CEQA Guidelines. According to this threshold, although a project may result in direct impacts to a population of a particular species, the significance of the impact depends on the extent to which the project reduces the numbers or range of a local population or the reduction of numbers or range of the resource on a region-wide basis. This threshold applies on a resource by resource basis and does not apply to state- or federally-listed Threatened or Endangered wildlife species, impacts to which are considered significant regardless of number of individuals impacted.

The CEQA threshold of significance for wildlife movement is whether or not the Project "interferes substantially with the movement of any native or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedes the use of native wildlife nursery sites." The project site provides a travel route to the shoreline of Big Bear Lake and does not qualify as a native resident or migratory wildlife corridor.

8-5 The conclusion cited from page 5.8-55 of the recirculated Biological Resources Section, applies to the loss of wildlife habitat available to common native wildlife

species on the project site. Project-related impacts to bald eagle are considered significant and unavoidable.

8-6 The thresholds of significance used in the impact analysis are taken directly from the Appendix G, Section 15065(a), and Section 15380 of CEQA.

8-7 Comment is noted. Please refer to Response to Comment No. 7-7.

8-8 Comment is noted.

8-9 Comment is noted.

- To Whom this should go To;

3/6/05

North Shore Drive is also Hwy 38
It is a beautiful drive along the Lake &
this should not be changed for someones
private use to build homes & a not
needed boat dock - Right next door to this
Proposed property change is already a
Boat Marina & boat dock with 175
Proposed slips - Marina Cove development.
The houses they want to build is ok if
they have the "water, sewer" problems" solved,
this property being a lot of hillside so water
table should be considered look what is happening
in all the areas in L.A - Orange Cty - Pasadena -
Pomona etc -
But most important the North Shore Drive
Hwy 38 - should not be changed for
Private enterprise. I have lived in
Fawnskin on + now just off North Shore Drive
+ Canyon for 33 years. My opinion should
be considered I love this valley and
Fawnskin - "Thank You,

9-1

Betty Conroy
P.O. 165
Fawnskin Ca 92333
tel 909-866-3245

Mooncamp Development
Project TCK properties

this letter was from
RBF - Planning - Design - Construction
consulting

Private 222
enterprise - -

Response to Commentor No. 9
Betty Conroy
March 2, 2005

9-1 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

COMMENT NO. 10

RECEIVED
MAR 24 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

March 16, 2005

Dear Mr. Slowick,

I am responding to the Review Draft EIR for the Mooncamp Development Project. As a 30 year owner of nearby property on Canyon Rd, I have many objections to the project but I will limit my concerns to the Biological Resources section.

10-1

Specifically, even after implementation of proposed mitigation measures, the project will seriously impact the wintering bald eagle population. This is an important site for these endangered birds, and should be protected by all levels of government.

Sincerely,

Carol Enos
2615 Chestnut
Orange, Ca 92867

Response to Commentor No. 10
Carol Enos
March 16, 2005

10-1 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

COMMENT NO. 11

39567 Oak Glen Road
Fawnskin, CA
March 15, 2005

RECEIVED
MAR 17 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Attn: Matthew W. Slowik Re: Mooncamp Development Project/RCK Properties, Inc.

Dear Mr. Slowik,

I'm the lady that called to tell you that I couldn't read the Biological Resources section of the EIR on your website. Thank you for helping me.

Having read Section 5.8, it seems apparent to me that allowing the Mooncamp project to be built would be a serious assault on the biological resources. Not only are there a very high number of special status plants and wildlife that would be affected to varying degree but Section 5.8-6 -- Cumulative Impacts, clearly states that the bald eagle would be affected not only by loss of habitat and food source but also by the presence of man. The effect of night lighting alone would "significantly affect" the eagles. This area is one of the most important habitats in the state of California. 11-1

Obviously, the bald eagle issue is the most significant impact mentioned in the report but as I read the entire report, I found that there are so many other forms of plantlife and wildlife that would be significantly affected – the Big Bear Valley Sandwort, the Ash-gray Indian Paintbrush, bird and bat foraging to name a few.

I am aware that you asked for comment only on the Biological Resources section but I would just like to say that as a homeowner in Fawnskin, I believe that this development would irrevocably change the entire area. I am concerned about the infrastructure supporting a huge, ungainly development of this sort. I am concerned about the water usage by this large number of units. I am concerned about property values plummeting. And I am truly alarmed that the County of San Bernardino might possibly decide that this development is in character with the surrounding area. You only need to stand on the land that will be covered by this development and look around at the surrounding area to see that this would be an insult to the land, its wildlife and plantlife and it's present inhabitants. 11-2

I most strongly urge you , as an Associate Planner for the County, as well as other members of the Planning Division and ultimately the Board of Supervisors, to decide against this extremely intrusive and damaging development.

Sincerely,
Diane Shattuck

Response to Commentor No. 11
Diane Shattuck
March 17, 2005

11-1 Comment is noted. Impacts to the bald eagle were determined to be significant and unavoidable by the Draft EIR analysis.

11-2 Comment is noted.

COMMENT NO. 12

April 14, 2005
County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA 92415-0182
Attention: Matthew W. Slowik

RECEIVED
APR 18 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

Regarding: Mooncamp Development Project/Rck Properties, Inc.
Draft EIR Biological Section Recirculation

This letter addresses the Moon Camp newly recirculated biological section of the DEIR.

The impact on the bald eagle population which visits Big Bear every winter would be significant. The mitigation measures recommended would not reduce direct or cumulative impacts to bald eagle habitat to a level considered less than significant. The DEIR states: "The proposed project contains some of the most utilized bald eagle roosting and perching habitat in the Big Bear Valley. Construction of the proposed project would diminish the habitat value of the project site for the Bear Valley." The cumulative effect of the loss of bald eagle perch and roosting trees if this project is to go forward, along with other past, present, and possible future developments planned for the Fawnskin / Big Bear area would significantly impact bald eagle habitat on the north shore of Big Bear Lake. The bald eagles are a big tourist attraction as well. 12-1

This project would take a general plan amendment for a change in the existing zoning. There can be no overriding considerations that justify this negative impact on the wintering bald eagle population in Big Bear.

Most sincerely,

Sandra Ellis

Sandra Ellis
PO Box 8542
Green Valley Lake, CA 92341

Response to Commentor No. 12
Sandra Ellis
April 14, 2005

12-1 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

COMMENT NO. 13

Rush E Wallace
PO Box 3064 Big Bear Lake, Ca
92315

County of San Bernardino

Land Use Services Department, Planning Division

385 N. Arrowhead Ave, First Floor

San Bernardino, CA 92415-0182

Attn: Matthew W. Slowik

Subject MOONCAMP DEVELOPMENT PROJECT/RCK PROPERTIES, INC. DRAFT EIR BIOLOGICAL SECTION RECIRCULATION.

As Chairman of the Executive Committee of the Big Bear Group of the Sierra Club I have grave concerns regarding the draft EIR for the above mentioned project. Specifically my concerns and comments are as follows:

-- What scientific basis is there for using 40% of normal rainfall as the time when they do another plant survey? Why shouldn't it be done with normal rainfall? 13-1

-- It is very unlikely that there is a place available that they can purchase for offsite mitigation for pebble plains habitat, so this is not a satisfactory mitigation. 13-2

-- The impact on bald eagles has been determined to be significant and the DEIR states that

"The proposed project contains some of the most utilized bald eagle roosting and perching habitat in the Big Bear Valley. Construction of the proposed project would diminish the habitat value of the project site for the species. When viewed in conjunction with other past, present, and reasonably foreseeable developments planned for the Fawnskin/Big Bear Lake area, the loss of bald eagle perch and roosting trees on the project site would significantly impact bald eagle habitat on the north shore of Big Bear Lake. Thus, cumulative impacts to the bald eagle are considered significant. Mitigation measures reflective of recommendations developed by scientific studies in the the Big Bear Valley, including Kimball Garrett's study on the effects of human activity on wintering bald eagles (1981), are provided as part of the proposed project. However, implementation of these mitigation measures would not reduce direct or cumulative impacts to bald eagle habitat to a level considered less than significant." 13-3

To approve this project the Supervisors would have to cite overriding considerations.

-Since this project would take a general plan amendment for a change in the existing zoning, there can be no overriding considerations that justify this negative impact on the wintering bald eagle population in Big Bear.

--In fact, since the economy of the valley very much thrives on nature, recreation and the existence of the bald eagle here, there would most likely be economic harm to the entire valley if this project is approved.

The County must start taking the protection of these valuable resources seriously. They can not be replaced by mitigation!

Rush E Wallace

Response to Commentor No. 13
Rush Wallace
April 14, 2005

13-1 Please refer to Response to Comment No. 7-7.

13-2 Please refer to Response to Comment No. 7-9.

13-3 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

COMMENT NO. 14

To: County of San Bernardino
Land Use Services Dept., Planning Division
385 N. Arrowhead Ave. First Floor
San Bernardino, Ca.92415-0182
Attn: Matthew W. Slowik

Refer to: Mooncamp Development/RCK Properties, Inc. Draft EIR Biological Section recirculation.

Sirs,
The people of Big Bear Valley have made it clear that an amendment to the General Plan for the Proposed MoonCamp Development would not be in the best interests of the future of this area.
We would lose valuable Eagle habitat, recreation and nature sites and the very reason this valley is unique. 14-1
There is no plus side to the overdevelopment of this unique Valley for the people who live here or the people who visit here to see exactly what you could help destroy if this proposal is approved.
I oppose this project and having taken part in the survey of Fawnskin regarding changes to the General Plan I can assure you that there is overwhelming opposition to these changes....
Don't kill our Valley.
Loretta L. Gardiner
P O Box 258
Fawnskin , Ca 92333

Response to Commentor No. 14
Loretta Gardiner
April 14, 2005

14-1 Comment is noted.

COMMENT NO. 15

To: Matthew W. Slowik
Rea: Mooncamp development

For your considcration.

Attention Matthew W. Slowik
Rea: Moon camp developmnent project/RCK Properties, Inc. Draft EIR Biological section recirculation.

-- What scientific basis is there for using 40% of normal rainfall as the time when they do another plant survey? Why shouldn't it be done with normal rainfall? 15-1

-- It is very unlikely that there is a place available that they can purchase for offsite mitigation for pebble plains habitat, so this is not a satisfactory mitigation. 15-2

– The impact on bald eagles has been determined to be significant and the DEIR states that "The proposed project contains some of the most utilized bald eagle roosting and perching habitat in the Big Bear Valley. Construction of the proposed project would diminish the habitat value of the project site for the species. When viewed in conjunction with other past, present, and reasonably foreseeable developments planned for the Fawnskin/Big Bear Lake area, the loss of bald eagle perch and roosting trees on the project site would significantly impact bald eagle habitat on the north shore of Big Bear Lake. Thus, cumulative impacts to the bald eagle are considered significant. Mitigation measures reflective of recommendations developed by scientific studies in the the Big Bear Valley, including Kimball Garrett's study on the effects of human activity on wintering bald eagles (1981), are provided as part of the proposed project. However, implementation of these mitigation measures would not reduce direct or cumulative impacts to bald eagle habitat to a level considered less than significant." (there are other quotes in the document, if you have a chance to look them up) 15-3

To approve this project the Supervisors would have to cite overriding considerations.
-Since this project would take a general plan amendment for a change in the existing zoning, there can be no overriding considerations that justify this negative impact on the wintering bald eagle population in Big Bear.
–In fact, since the economy of the valley very much thrives on nature, recreation and the existence of the bald eagle here, there would most likely be economic harm to the entire valley if this project is approved.

Response to Commentor No. 15
Unknown
April 14, 2005

15-1 Please refer to Response to Comment No. 7-7.

15-2 Please refer to Response to Comment No. 7-9.

15-3 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

COMMENT NO. 16

Georg R. Kast, P.E.
39152 Choctaw Dr.
Fawnskin, CA 92333

April 14, 2005

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA 92415-0182

Attn: Matthew W. Slowik

Reference: Mooncamp Development Project/Rick Properties, Inc. Draft Elr Biological Section Recirculation

Subj: Comments on revised Moon Camp DIER

Dear Sir or Madam:

I have significant concerns regarding the referenced filing. My fundamental concerns that the project violates common sense with regard to the continued development and expansion of the population base in an area where the available water cannot sustain it are still valid and in the forefront of my opposition of the project. Additional latent concerns include the elimination of native shoreline, urbanization of a rural setting and diminished public access to access and view of the lake. 16-1

With regards to the changes in the DEIR, I am concerned that the project will destroy a significant portion of the Bald Eagle Habitat at Big Bear Lake. Specifically,

> "The proposed project contains some of the most utilized bald eagle roosting and perching habitat in the Big Bear Valley. Construction of the proposed project would diminish the habitat value of the project site for the species. When viewed in conjunction with other past, present, and reasonably foreseeable developments planned for the Fawnskin/Big Bear Lake area, the loss of bald eagle perch and roosting trees on the project site would significantly impact bald eagle habitat on the north shore of Big Bear Lake. Thus, cumulative impacts to the bald eagle are considered significant. Mitigation measures reflective of recommendations developed by scientific studies in the the [sic] Big Bear Valley, including Kimball Garrett's study on the effects of human activity on wintering bald eagles (1981), are provided as part of the proposed project. However, implementation of these mitigation measures would not reduce direct or cumulative impacts to bald eagle habitat to a level considered less than significant."

16-2

The bald eagle is an integral component of the wildlife diversity that draws visitors to the valley. In fact, since the economy of the valley very much thrives on nature, recreation and the existence of the bald eagle here, there would most likely be economic harm to the entire valley if this project is approved.

Thank you for your attention and consideration of my input

Sincerely,

Response to Commentor No. 16
George Kast
April 14, 2005

16-1 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

16-2 Comment is noted. The Draft EIR section and biological technical report identify project-related impacts to bald eagles and their perch trees as significant and unavoidable impacts and significant and unavoidable cumulative impacts.

COMMENT NO. 17

County of San Bernardino, Attn. Matt W. Slowik
Land Use Services Dept, Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA 92415-0182

RECEIVED
APR 18 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

RE: Moon Camp Development Project/RCK Properties, Inc. Draft EIR
Biological Section Recirculation
FAXED: ~~April 15, 2005~~ to ~~(909)~~ 387-3223

ATTN: Matthew W. Slowik

I have been a property owner and full-time resident on Flicker Road since 1974. Since I made comment on the initial EIR circulation, I was notified about the Recirculated DEIR, and the opportunity for additional comments concerning the Moon Camp Project.

It seems there are flaws in the DEIR study that seems to suggest that off-site mitigation is possible for pebble plain habitat and other biological species. First, where is the mitigation site? Who will monitor it? Is it equal or better than the existing site? **17–1**

Secondly, a few years back in Orange County, a citizen's group looked into off-site mitigation for some projects. They found that there was no monitoring, and no follow-up by the County to ensure that the mitigation actually took place. In Big Bear, Eagle Point and Castle Glen-the same developer as Moon Camp- were supposed to contribute to an eagle mitigation fund in Stanfield Marsh. When I went to the Big Bear Municipal Water District to find out who and who much had been contributed to that fund, I was told that there were no such records-so much for off site mitigation by any developer. **17–2**

Third, and finally, under real estate law, no two pieces of real estate are considered the same. Each piece is deemed unique. The Moon Camp habitat is unique and can not effectively be duplicated anywhere else in the world. **17–3**

I urge you to preserve that uniqueness.

Sincerely,

ROBERT S. DRAKE, 39722 Flicker Road, Fawnskin, CA 92333

FAXED

Response to Commentor No. 17
Robert Drake
April 15, 2005

17-1 Implementation of Mitigation Measure 5.8-1a requires that a pebble plains mitigation site is identified prior to any vegetation clearing, grading, or other site disturbance on the project site. Although a specific site has not been identified by the project applicant, the project would not be allowed to move forward until a mitigation site is identified and purchased. The County of San Bernardino and the California Department of Fish and Game shall be responsible for the enforcement of the mitigation requirements. The mitigation measures stated that off-site habitat shall contain the same species as those identified within resources impacted by the proposed project and shall be purchased at a ratio of 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development).

17-2 The County of San Bernardino is not proposing off-site mitigation for bald eagles.

17-3 Comment is noted.

COMMENT NO. 18

RECEIVED
APR 18 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

County of San Bernardino, Attn. Matt W. Slowik
Land Use Services Dept, Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA 92415-0182

RE: Mooncamp Development Project/RCK Properties, Inc. Drafe EIR
Biological Section Recirculation
FAXED: April 15, 2005 to ((909) 387-3223 (73151)

ATTN: Matthew W. Slowik

I have been a property owner and full-time resident on Flicker Road since 1974. Since I made comment on the initial EIR circulation I was under the impression that I would be notified on any additional comments needed concerning the Moon Camp Project . To date I have not received any information from the county on the biological section as it was recirculated. It was through a neighbor that I was told of this deadline and I send my comments faxed and in a timely manner. **18–1**

It seems there are flaws in the DEIR study that seems to suggest that off-site mitigation is possible for the bald eagle habitat and the pebble plains habitat. This was a problem in Castle Glen, Eagle Point, and Cluster Pines Projects After several phone calls to agencies I cannot find where the off-site mitigations are located nor can I find out where any monetary compensations have been sent and administered. These past project mitigations should be listed in your DEIR so that the same off-sites are not suggested over and over again to approve a project **18–2**

The human activity and density of the project would have a significant impact on bald eagle habitat especially if the project allows for the realignment of our county scenic highway and homes are stacked on the shoreline. This is unacceptable since builders should be expected to build as per the zoning they purchased. I see no overriding considerations that justify changing the existing zoning to allow this negative impact on the wintering Bald Eagle and the biological species listed as well. **18–3**

Respectively submitted,

Mary Lu Drake

Mary Lu Drake
39722 Flicker Road, Fawnskin, Ca.

Response to Commentor No. 18
Mary Lu Drake
April 15, 2005

18-1 Please refer to Comment Letter No. 17. The County of San Bernardino notified 39722 Flicker Road regarding the recirculation and review for the biological resources section of the EIR.

18-2 Please refer to Response to Comment Nos. 17-1 and 17-2.

18-3 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

COMMENT NO. 19

Sandy Steers
P.O. Box 423
Fawnskin, CA 92333
(909) 878-3091

RECEIVED
APR 18 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

15 April 2005

Sent by FACSIMILE (909-387-3223), hard copy to follow via U.S. Mail

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Avenue 1st Floor
San Bernardino, California 92415-0182

Attn: Matthew Slowik, Sr. Assoc. Planner

RE: "REVISED BIOLOGICAL RESOURCES SECTION OF THE DEIR FOR THE PROPOSED MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC."

Thank you for the opportunity to comment on this revised Biological Resources section of the DEIR for the proposed Moon Camp Development Project.

Although changes have been made to this Biological Resources section, the overall section and the DEIR as a whole remain inadequate and incomplete. I concur with the details of those inadequacies as stated in the Friends of Fawnskin/Center for Biological Diversity letter. **19–1**

In addition, I would like to point out another level of inadequacies in the bald eagle mitigations offered. In this revised section, the purchase of off-site habitat to mitigate for a small portion of the plants has been suggested. However, no purchase of off-site habitat has been suggested for the bald eagle. The most likely reason for this omission of an often included mitigation measure is that there is no equivalent off-site habitat available. This fact alone points to the glaring understatement of the adverse impacts to the bald eagle should this proposed project be approved. **19–2**

Considering that this mitigation measure, which should be and is often included to mitigate for loss of habitat, cannot even be suggested, shows clearly a primary reason that this proposed project should be entirely rejected. It is imperative to the biological resources and especially to the bald eagle that the 'no project' option be selected. **19–3**

Sincerely,

Sandy Steers

Response to Commentor No. 19
Sandy Steers
April 15, 2005

19-1 Comment is noted.

19-2 Please refer to Response to Comment No. 16-2.

19-3 Comment is noted.

COMMENT NO. 20

ATTEN: MATT

MOONCAMP DEVELOPMENT PROJECT/RCK PROPERTIES, INC. DRAFT EIR

BIOLOGICAL SECTION RECIRCULATION.

MY FAMILY AND I ARE VERY CONCERNED AVOUT THE BALD EAGLE ROOSTING AND PERCHING HABITAT IN THE BIG BEAR VALLEY. CONSTRUCTION OF THE PROPOSED PROJECT WOULD DIMINISH THE HABITAT VALUE OF THE PROJECT SITE FOR THE SPECIES. WHEN VIEWED IN CONJUNCTION WITH OTHER PAST, PRESENT, AND REASONABLEY FORESEEABLE DEVELOPMENTS PLANNED FOR THE FAWNSKIN/BIG BEAR LAKE AREA THE LOSS OF BALD EAGLE PERCH AND ROOSTING TREES ON THE PROJECT SITE WOULD SIGNIFICANTLY IMPACT BALD EAGLE HAVITAT ON THE NORTH SHORE OF BIG BEAR LAKE. THUS, CUMULATIVE IMPACTS TO THE BALD EAGLE ARE CONSIDERED SIGNIFICANT. PLEASE KNOW WHERE WE ARE COMING FROM ON THIS WE WANT TO PROTECT BIG BEAR. SO KNOW THAT MY FAMILY AND I ARE AGAINST THIS PROJECT.

20-1

THANK YOU,

DONALD WHEELER
&
WHEELER FAMILY

Response to Commentor No. 20
Donald Wheeler and Wheeler Family
April 15, 2005

20-1 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

COMMENT NO. 21

VIA FACSIMILE

April 15, 2005

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA 92415-0182
Attn: Matthew W. Slowik

RE: Proposed Moon Camp Development

Dear Mr. Slowik,

As a full-time resident of Big Bear Lake, I am writing to voice my concerns concerning the proposed Moon Camp development.

My primary concern is on the negative impact on the bald eagle habitat in that area. In fact, the DEIR states that "The proposed project contains some of the most utilized bald eagle roosting and perching habitat in the Big Bear Valley. Construction of the proposed project would diminish the habitat value of the project site for the species. When viewed in conjunction with other past, present, and reasonably foreseeable developments planned for the Fawnskin/Big Bear Lake area, the loss of bald eagle perch and roosting trees on the project site would significantly impact bald eagle habitat on the north shore of Big Bear Lake. Thus, cumulative impacts to the bald eagle are considered significant. Mitigation measures reflective of recommendations developed by scientific studies in the the Big Bear Valley, including Kimball Garrett's study on the effects of human activity on wintering bald eagles (1981), are provided as part of the proposed project. However, implementation of these mitigation measures would not reduce direct or cumulative impacts to bald eagle habitat to a level considered less than significant." This sounds like a very serious consideration to me which should be weighted heavily by the Supervisors. 21-1

It is also my understanding that to approve this project the Supervisors would have to cite overriding considerations. Since this project would take a general plan amendment for a change in the existing zoning, there can be no overriding considerations that justify this negative impact on the wintering bald eagle population in Big Bear. In fact, since the economy of the valley very much thrives on nature, recreation and the existence of the bald eagle here, there would most likely be economic harm to the entire valley if this project is approved. 21-2

Thank you,

Lisa Patterson
PO Box 412
Big Bear Lake, CA 92315

Response to Commentor No. 21
Lisa Patterson
April 15, 2005

21-1 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

21-2 Comment is noted.

COMMENT NO. 22

April 15, 2005

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Avenue, 1st Floor
San Bernardino, Ca. 92415
Attn: Matthew Slowik

Re - Moon Camp Development, RCK Properties, Inc, Draft EIR Biological Section

Dear Mr. Slowik,

I write to comment on the draft EIR, Biologic Section, for the Moon Camp proposed development. I have a number of concerns that I believe are not sufficiently addressed or dealt with in the draft EIR. These include the following:

- the impact on the bald eagles is not capable of remediation or planning. | 22–1
- the project site is one of the largest and most often used sites for the eagles during their wintering habitat in the Big Bear Valley | 22–2
- since the draft EIR has already concluded that construction would diminish the habitat value, there is simply no proper action which can or should be taken that could accommodate the presence of eagles and the construction of approximately 90 homes | 22–3
- some may argue for the purchase of 'replacement habitat' somewhere else to compensate for the loss of habitat due to the construction project. The problem with this approach is that there is no comparable habitat available around the lake that would serve this purpose. Thus, any consideration of the project must exclude the notion that other land may be set aside as habitat. It simply doesn't exist. | 22–4
- the same concern exists for the pebble plains habitat. There is no comparable site available to compensate for the destruction of endangered species which the proposed project will cause. | 22–5

Thank you for your consideration of these concerns.

Very truly yours,

Roman Silberfeld

Response to Commentor No. 22
Roman Silberfeld
April 15, 2005

22-1 Comment is noted.

22-2 The Draft EIR section and biological technical report identify project-related impacts to bald eagles and their perch trees as significant and unavoidable impacts and significant and unavoidable cumulative impacts.

22-3 Comment is noted.

22-4 Refer also to Response to Comment No. 7-7. Implementation of Mitigation Measure 5.8-1a requires that a pebble plains mitigation site is identified prior to any vegetation clearing, grading, or other site disturbance on the project site. Although a specific site has not been identified by the project applicant, the project would not be allowed to move forward until a mitigation site is identified and purchased.

22-5 Please refer to Response to Comment No. 7-9.

COMMENT NO. 23

Nancy & Bill Hazewinkel
880 Canyon Rd. PO Box 378
Fawnskin, CA 92333

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA 92415-0182
Attn: Matthew W. Slowik

APR
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

RE: MOONCAMP DEVELOPMENT PROJECT/RCK PROPERTIES, INC. DRAFT EIR
BIOLOGICAL SECTION RECIRCULATION

April 15, 2005

Dear Mr. Slowik,

We are responding to the Draft EIR for the proposed Mooncamp project in Fawnskin. We have several concerns which are described below:

- What scientific basis is there for using 40% of normal rainfall as the time when they do another plant survey? Why shouldn't it be done with normal rainfall? **23-1**
- It is very unlikely that there is a place available that they can purchase for offsite mitigation for pebble plains habitat, so this is not a satisfactory mitigation. **23-2**
- The impact on bald eagles has been determined to be significant and the DEIR states that "The proposed project contains some of the most utilized bald eagle roosting and perching habitat in the Big Bear Valley. Construction of the proposed project would diminish the habitat value of the project site for the species. When viewed in conjunction with other past, present, and reasonably foreseeable developments planned for the Fawnskin/Big Bear Lake area, the loss of bald eagle perch and roosting trees on the project site would significantly impact bald eagle habitat on the north shore of Big Bear Lake. Thus, cumulative impacts to the bald eagle are considered significant. Mitigation measures reflective of recommendations developed by scientific studies in the Big Bear Valley, Including Kimball Garrett's study on the effects of human activity on wintering bald eagles (1981), are provided as part of the proposed project. However, implementation of these mitigation measures would not reduce direct or cumulative impacts to bald eagle habitat to a level considered less than significant." **23-3**
  - Since this project would take a general plan amendment for a change in the existing zoning, there can be no overriding considerations that justify this negative impact on the wintering bald eagle population in Big Bear.
  - In fact, since the economy of the valley very much thrives on nature, recreation and the existence of the bald eagle here, there would most likely be economic harm to the entire valley if this project is approved.

We have many concerns for our community, and do not want to see our beautiful forests reduced any further. Fawnskin should not become another Big Bear Lake.
Residents and visitors come here *because* it has been somewhat protected so far, please do not allow developers to overdevelop this side of the lake. For instance, moving North Shore Drive to provide lakefront property for the sole purpose of making more money is unconscionable. One of our concerns is that the County Supervisors are more interested in the income that such a project would generate, than in preserving the natural beauty, and future environment of our area, and our planet. **23-4**

Very truly yours,

Nancy Hazewinkel & Wil C. Hazewinkel

Response to Commentor No. 23
Nancy and Bill Hazewinkel
April 15, 2005

23-1 Please refer to Response to Comment No. 7-7.

23-2 Please refer to Response to Comment No. 7-9.

23-3 Please refer to Response to Comment No. 13-3.

23-4 Comment is noted.

COMMENT NO. 24

RECEIVED
APR 18 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

Daniel A. Levenick
334 Pine Kone Ln.
Fawnskin, CA
and 866 South Grand Avenue
Pasadena, CA

April 15, 2005

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA 92415-0182
Attn: Matthew W. Slowik

Reference to: MOONCAMP DEVELOPMENT PROJECT/RCK PROPERTIES, INC. DRAFT EIR BIOLOGICAL SECTION RECIRCULATION.

Mr. Slowik,

I am a part time resident of Fawnskin, CA. the town of this project site. I have read the revised draft EIR and have the following comments, in rough order of the progress of the report.

I have a BS degree in biological sciences from UCSB; I have done graduate work at the University of Idaho in the College of Forestry and wildlife. I specifically studied Fisheries and fishery management. To my reading of this DEIR, there are substantial detrimental effects that this project brings to the site. This site was originally set aside at low density in mitigation for overdevelopment elsewhere. The proposed mitigation here is to simply move the problems with destroyed habitat further down the road. It is not possible to mitigate roosting and perching habitat for the Bald Eagle. **24–1**

I urge you to require further study of vegetation habitats in normal rain years. That should be simple this year. The plant diversity and presence will greatly improve over the year 2002, and will be a truer picture of the diversity available. **24–2**

The description of habitats include Jeffery pine forest only, declines to admit that wetlands exist between forest and lake shore. Most unusual as there are ducks breeding, brood ponds, seasonal ponds and roosting areas in the area concerned, but no wetlands. How does that happen? Ducks need wetlands to breed. Their description ignores the overall weather pattern of abundance and drought that is common in this locale. Where is the 0.15 ac CDFG jurisdictional streambed? **24–3**

Wildlife movement:

Presently SR 38 is a 2 lane slow traffic hwy, which allows for many small mammals and reptiles to migrate easily. The whole road might be considered a wildlife corridor or **24–4**

crossing, as it is narrow and is infrequently traveled. The strict definition listed in the DEIR essentially delineates the entire lake from the entire forest with very few travel routes, wildlife corridors or wildlife crossings as there are no culverts, green belts, forests that stretch directly from the mountain tops to the lake front uninterrupted at any point of the lake. Therefore to suggest that there are no corridors or crossings is to simply admit that there is a road around the entire lake. A living organism cannot traverse the slope from the mountain peak to the lake level without crossing at least one road anywhere. Highway 18 provides the least obstacle to wildlife. Currently the path of least resistance to wildlife is the shortest path between the forest and the water, that path is not to the East or the West, it is directly with the fall line from hilltop to lake level, right through the project in question. Contrary to the reports' statement, a larger hwy with more lanes, more traffic and a higher speed limit will reduce efficiency of travel of migrant native species to and from water or habitat due to a larger distance to travel over a paved surface without cover.

24–4

Endangered species:

Of rare, threatened, or endangered plant species listed by California native plant society the site has 21 species present or likely to be present. Of plants on US Fish and Wildlife Service and California Dept of Fish and Game listing of endangered, threatened or likely to be listed as threatened or endangered this site has 14 species preset.

Protected, rare, endangered, or threatened animal species that include invertebrates, amphibians, reptiles, birds and mammals as defined by the USFWS and California Dept Fish and Game are also present on the site. Protected, rare, threatened or endangered present species number 6, Species of Concern or special concern number 35.

24–5

These counts represent significant numbers of species affected on this site.

In the report, most of these special class, rare or endangered species are simply dismissed as not significant. That is outrageous! They are rare or endangered for a reason.

Special Status vegetation types:

Pebble plain as described on the site has already been altered due to unauthorized use. This abuse of the plain has degraded habitat for rare, threatened or endangered species as noted in report. Unauthorized use represents neglect on the part of the landholder, and should be curtailed immediately before sever damage occurs.

24–6

Montane meadow is currently unmapped in this report. It is however known to support endemic species and is recognized as a rare ecological community of concern to the San Bernardino National Forest. The montane meadow acreage needs to be measured, the flora and fauna identified.

24–7

Special status plants occurring on the site were evaluated during a low rain year. Admitted expectations were that more rain will bring forth more diverse growth. Surveys during a normal rain year are required to determine presence and extent of many of the special status plants. 24-8

Special status wildlife: Contained in table 5.8-3 is listing of special status animals. Many of which spend a part of their life cycle on the project site. Each part of the life cycle is necessary to the completion of the whole life cycle. Therefore, to remove the habitat and environment necessary for part of the life cycle endangers the likelihood of completing that life cycle successfully. 24-9

To find that there is little or no impact on the local species, because there is other habitat available is to shirk responsibility. There is limited habitat for the Bald Eagle in southern California. Big Bear Lake area has the largest wintering population of Bald Eagles in Southern California, some of that population utilizes the project site, when the site is removed from use, the Eagles' range is reduced. That reduction cannot be tolerated. 24-10

The continual finding that there is significant local impact, but overall impact is slight due to the availability of other sites is simply a carefully worded way to say 'it's OK for me but not for you.' The fact is that site was set aside as low density building site RL-40 as mitigation for high density building on the South Shore. It was set at low density exactly to mitigate habitat destruction elsewhere. When that site is destroyed, where is the mitigation for it?

By survey and admissions in the survey, there are shortcomings in this summation. Namely, due to weather conditions surveys of montane meadows were not done, the true extent of plant life was not fully explored. Now, in this current high rain year, there is opportunity to fully address the diversity of plant life and meadow extent. That assessment is necessary for a true evaluation of the site. 24-11

This report is nothing more than a gloss over of admitted severe habitat destruction by using the phrase 'not significant overall' on each species individually. Enough individually insignificant items become significant when taken as a whole. 24-12

Thank you for your time,

Daniel A. Levenick

Response to Commentor No. 24
Daniel Levenick
April 15, 2005

24-1 Comment is noted.

24-2 Please refer to Response to Comment No. 5-2.

24-3 Implementation of Mitigation Measure 5.3-8a would reduce impacts to jurisdictional areas on the project site. The jurisdictional streambed locations have been identified in the Draft EIR and recirculated Biological Resources Section. Please refer to Page 5.8-7 of the recirculated Biological Resources section for additional information.

24-4 Please refer to Response to Comment No. 7-19.

24-5 Impacts to special status plants would be mitigated to a level considered less than significant by implementation of Mitigation Measure 5.8-1a.

Impacts to potential habitat for special status species not listed as Threatened or Endangered are considered less than significant due to the limited amount of habitat loss associated with the proposed project relative to the availability of habitat for these species in the region.

Cooper's hawk, long-eared owl, white-tailed kite, California spotted owl, hepatic tanager, and purple martin have potential to nest on the project site. If an active bird nest (common or special status species) were found on the project site, the loss of the nest would be considered a violation of the California Fish and Game Code Sections 3503, 3503.5, and 3513. Implementation of Mitigation Measure 5.8-1e would reduce impacts to a less than significant level.

24-6 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

24-7 Please refer to Response to Comment No. 7-10.

24-8 Please refer to Response to Comment No. 5-1.

24-9 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

24-10 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

24-11 Please refer to Responses to Comment Nos. 5-2 and 7-10.

24-12 Comment is noted.

COMMENT NO. 25

April 15,2005

County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Ave. 1st Floor
San Bernardino, CA 92415-0182

Attn. Matthew W. Slowik

RE: MOONCAMP DEVELOPMENT PROJECT/RCK PROPERTIES, INC. DRAFT EIR BIOLOGICAL SECTION RECIRCULATION

Dear Sir,

Thank you for allowing us to review the new biological section. Neither my wife nor I are biologists but we know what we like. We love seeing the bald eagles in the winter. We can see them from our deck flying over the lake, perched in the trees on the Mooncamp property or standing on the ice looking for food.

In the report it's stated that even with saving the perch trees there will be a significant effect on the bald eagles. We feel the bald eagles are very important to our community and every effort possible should be made to protect their environment. We don't think building 92 homes on property zoned RL-40 should be pursued with the fragile state of the bald eagle. The number of bald eagles coming into our valley has been decreasing in the recent years and we don't need to do anything to add to that number. 25–1

In the report it's stated they will do another plant study when they have a year with at least 40% of normal rainfall. The average rainfall in the city of Big Bear Lake is about 22.75 inches per year. We assume Fawnskin will have the same amount of rainfall. By this criteria the new study will be made on 9.10 inches of rain. We don't think this is acceptable. The study should be made with at least 2/3rds of normal rainfall. 25–2

We hope you take our concerns into consideration and deny this zone change.

Sincerely,

James C. McGrew

James C. McGrew

Lola E. McGrew

Lola E. McGrew

P. O. Box 493
Fawnskin CA, 92333-0493

Response to Commentor No. 25
James and Lola McGrew
April 15, 2005

25-1 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

25-2 Please refer to Response to Comment No. 7-7.

April 15, 2005

VIA FACSIMILE - (909) 387-3223

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182
Attn: Matthew W. Slowik

Re: Moon Camp Development Project/RCK Properties, Inc. --
Draft EIR Biological Section as Re-circulated

Dear Mr. Slowik:

After review of the draft EIR biological section which was re-circulated, we have the following comments and concerns.

1. Use of dated information

I note that the "focused surveys" stated as having been made were all conducted during 2002. Since that time, several additional years of extreme drought conditions and a major fire in an adjacent area may have affected the subject site. In particular, the tree surveys are described as having been prepared in 2001. Given the impact of drought and the bark beetle since that time, the County should require that this report be based on a more recent tree survey. It may be that removal of and damage to trees which was appropriate or acceptable based on the 2001 survey is no longer appropriate or acceptable based on current conditions. The County should take note that there have been dramatic impacts on the San Bernardino National Forest areas since 2001 and require more recent

26-1

information. Furthermore, bark beetle devastation to the forest areas on the Western side of Grout Bay may have made the project site a more important source of shelter, foraging area and other uses by wildlife. For that reason, the wildlife surveys should also be revised and up-dated. The draft says, based in part on a 2001 aerial survey, that "although a large number of dead trees were observed...only one tree was observed to have been recently killed by bark beetles." This statement is most likely inaccurate in 2005, and a supposedly re-done biological section should address and correct the inacurracy. 26–1

2. Pebble Plain

On page 5.8-4, the draft biological resources section suggests that activities are being taken pursuant to a "pebble plain habitat management guide and action plan." The report does not indicate whether the forest service is taking these actions on the subject property, whether the developer and project proponent has agreed to take such actions or whether, in fact, any actions are occurring on the subject property. This confusing and misleading portion of the report should be clarified. The County is unable to properly evaluate the potential loss of pebble plain habitat and the endangered species described in this section without knowing whether the mitigation and correction efforts alluded to are happening or not. 26–2

3. Meadow

On page 5.8-7, the draft report states the "extent of the meadows could not be determined or mapped in 2002 due to dry conditions." Before approving the report, the 26–3

County should require that this area be re-surveyed given the recent, although perhaps temporary, abatement of drought conditions. 26-3

4. Wetlands

The draft report states on page 5.8-8 that no wetlands were identified. We understand the United States Army Corps. of Engineers and the Environmental Protection Agency do not necessarily accept this position. This portion of the report should be re-evaluated given existing lake levels because the conclusions made were based on 2002 data. 26-4

5. Special Status Plants

The discussion beginning on page 5.8-25 and continuing for several pages, contains numerous statements about whether certain things are potentially likely to occur and whether certain special concerned species were observed in 2002. As this occurred during a significant drought which has now at least temporarily been abated, this section should be updated to reflect current conditions. The County should request that this information be taken immediately since much of this discussion indicates that the species in question bloom beginning in April and continue through early Summer. The opportunity to rectify this deficiency in the report will be lost if quick action is not ordered. 26-5

6. Animal Species

The information about bird habitat seems to be somewhat boilerplate and in several respects inaccurate. For example, the report concludes on the basis of an analysis of the 26-6

site, that it has a low potential for foraging on behalf of peregrine falcons. This is inconsistent with known bird-watching groups and personal observation, which indicate that the peregrine falcon regularly uses this site in the summer. This inconsistency should be reconsidered. 26–6

Although the general language in the introduction to the report describes the wild turkey, the report itself does not mention any specific observations about wild turkeys. It is known that this site is used by wild turkeys, and that from their roosting and nesting areas on higher elevations, they use this site for access to the lake. The impact of development of this site on the wild turkey, and on the forest service and wildlife service efforts to re-introduce the wild turkey to the area should be addressed and the failure to do so is a deficiency in the report. 26–7

7. Mammals

The discussion of mammals beginning on page 5.8-39 is incomplete. The general language in the introduction to this section of the report mentions mule deer and other species which are not discussed in this section. Additionally, nowhere in the report are coyotes and mountain lions mentioned although both are known to inhabit the area. Failure to discuss the impact on these animals, both of which have been observed on or near the project site, is a deficiency which ought to be corrected. 26–8

8. Vegetation and Wildlife Impact Tables

The discussion beginning page 5.8-46 on vegetation types impacted should be revised and the table updated following completion of the additional survey measures described above. Since this table was prepared from 2002 data during a drought it is more than likely our of date. Also, the absence of a similar table for wildlife and animal resources is noted. Such a table should be included so that the County may adequately consider the impact on animal species. 26–9

9. Impact on meadows

The Montane Meadows paragraph on page 5.8-47 should be revised after additional work is done now that the drought conditions which the report claims limited the ability to monitor have been at least temporarily mitigated. After this is done, the statement that impacts on these species "would be considered significant" should be considered for strengthening. Also, the proposed mitigation referred to, mitigation 5.1a, (discussed at page 5.8-62) must be improved. The statement states that the project applicant shall pay compensation for the loss of special status resources by arranging for the purchase and maintenance of off-site habitat. The report does not propose or make clear that this habitat would be located in or near the adjacent site or, indeed, that such habitat is available anywhere within the Bear Valley. Because of the high impact of wildlife status on local opportunities including fishing, hiking, bicycling and similar activities, it is important that impacted habitat be replaced at or near the site, or at least within the Bear Valley. Failure to do so could have an adverse economic impact on residents of the Valley by deterring or failing to attract visitors, including the many visitors who come to observe 26–10

nature. If the report is approved, it should be a report which includes arrangements to fund these activities, identify the replacement habitat prior to the commencement of any activities, and place the funds in an escrow or similar account designed to assure first, that the funding is actually paid and second that it is administered by appropriate conservation or wildlife officials. The numerous references to mitigation measure 5.8-1a require, at a minimum, that this mitigation measure be revised to include mitigation within the Bear Valley and appropriate funding in a separate account. 26-10

10. Wildlife

The discussion beginning on page 5.8-49 is inadequate because, due to some of the factors mentioned above, it fails to address or consider certain significant species. In addition, the report itself notes that this is based on surveys during an extreme drought. Even with these inadequacies, impact on several species including the Bald Eagle is stated to be significant and not capable of mitigation. This conclusion should be stated in greater detail and evaluated in light of the fact that much of the habitat formerly used by Bald Eagles in the Bear Valley has already been lost to development, including that at the Eagle Point Project, where mitigation measures proved unsuccessful. Additionally, a discussion of a number of species on page 5.8-50, including the peregrine falcon, should be revised to reflect the fact that these species are known to have used the area and to provide greater emphasis on the fact that approval of this project would contribute to the cumulative loss of foraging habitat. Although the report suggests that adjacent areas of foraging habitat for these species would be available in the San Bernardino National 26-11

Forest, the impact on recreational uses of the Bear Valley, especially the lakefront areas, due to loss of habitat accessible by visitors, should be explored in greater detail. In this regard, proposed mitigation measure 5.8-1d is inadequate because it would only apply prior to the onset of "construction activities" and the adverse impacts would already have occurred from grading and clearing activities. This so-called mitigation can also be eviscerated by constructing in the Fall or Winter time periods, because the mitigation depends on the discovery of "active nests" and it is extremely unlikely that "active nests" would be found after the spring nesting. Therefore, this mitigation proposal should be strengthened and identification of appropriate habitat near areas which are accessible to visitors, a major source of revenue to the Bear Valley, must be explored. 26-11

11. Mammals

The discussion on page 5.8-51 is inadequate because it does not cover many of the mammal species identified, including the mule deer, and the non-identified coyotes and mountain lions. 26-12

12. Discussion of Impacts

The discussion on page 5.8-52 is conclusory and not supported by other portions of the report. Mentioning that impact on the Jeffrey Pine Forest is insignificant because the pine is found elsewhere in the San Bernardino Mountains does not address the fact that loss of forest habitat directly impacts the Bear Valley. Loss of this habitat on the north shore of the lake reduces the appeal of the lake for recreational use by impacting use to boaters and 26-13

fishermen and tourists occupying the commercial areas of the south shore of the lake. In this regard, the discussion of lakeshore line should be revised to de-emphasize the fact that Big Bear Lake is man-made. Although it is correct that the Bear Valley Dam created this lake, that was almost a century ago with respect to the initial dam and over 80 years ago with respect to the revised dam. Therefore, the impact on lake shoreline should be evaluated without disparaging remarks about man-made reservoirs. The discussion of Pebble Plain habitat should be revised to point out whether or not it is feasible to acquire, develop, construct or preserve additional pebble plain habitat in an adjacent area. While there may be Pebble Plain habitat in other parts of southern California, the impacted species will not be able to migrate to these areas. The preservation of Pebble Plain habitat in the Bear Valley is important.

26–13

13. Suggested Mitigation Of Noise Impact And Impact On Eagles

The discussion on page 5.8-56 about the infeasibility of mitigating impact from noise on Bald Eagle populations because impact requirements on lesser-endangered species such as plants and animals, is disingenuous. If the project proponent wishes to take a parcel zoned for very limited development, and previously designated as a rural area in the County's general plan, and transform it into a densely populated urban-type environment, the project proponent should bear the burden of avoiding or mitigating all significant impacts. The project proponent's draft of the report suggests that this might require confining construction to a very few short months of the year, essentially late summer and early autumn. The project proponent s 14-358 required to factor this type of restriction

26–14

into its assessment of the desirability of the project. Since it would be necessary to conduct such limitations to avoid the impact on wintering Bald Eagle populations and on summer plant species, the project proponent is essentially demonstrating the infeasibility of the project itself without disastrous impact on plant and wildlife communities. 26-14

14. Impact of Night Lighting

The report states on page 5.8-56 and following that impact from night lighting at the project during construction and after occupancy would be a problem. The proposed mitigation measures are inadequate unless density of the proposed project is significantly reduced and more strict limits on night lighting are proposed. Moreover, in this regard, the night lighting restrictions should also be evaluated in terms of their impact on neighboring homes. Significant lighting in this project is likely to cause glare for residents above and adjacent to the project and to impair activities such as star gazing, night walking and wildlife observation. These impacts should mean that significantly stronger mitigation measures should be imposed before this report can be approved. 26-15

15. Non-native Species Introduction

The discussion on page 5.8-57 ignores the likely impact of residential development on the introduction of non-native species introduction. The proposed mitigation 5.8-2d must be improved to state that landscaping shall not be allowed to use any non-native plants. In addition, it should be revised to state that "lawns" and similar plantings will not be allowed, as both inconsistent with the l 14-359 l nature of the area and with the current 26-16

past and likely long-term water shortages in the area. In a dry woodland/pebble plain habitat, the watering and introduction of grasses associated with residential development must be strictly prohibited to avoid irretrievably damaging the nature of the area. In addition, this mitigation measure should including reducing the number of residences so that the density of construction will not significantly impact the nature habitat. Finally, mitigation measures should include requiring the project proponents to remove the proposed barrier walls. The project is slated to be a gated community, which frustrates the impact of all proposed mitigation efforts by proposing insurmountable barriers to migration of plant and animal species. 26-16

16. Wetlands

As noted above, in comment (4) the wetland determination statements in the report on page 5.8-58 and following are inconclusive, vague and non-supported. The work behind these statements should be re-evaluated in light of current conditions and in concurrence or non-concurrence should be obtained from the agencies mentioned because past development activities in the area have indicated that County officials permit dredging and similar activities without a section 404 permit. Comments from the Army Corps of Engineers, the California Department of Fish and Game, and the Regional Water Quality Control Board should be obtained and included this report before it is submitted for approval. 26-17

17. Wildlife Movement

Beginning on page 5.8-59, the draft states the wildlife movement would not impact wildlife corridors. The proposed project is a walled and gated community, therefore this statement is incorrect and should be revisited. 26-18

18. Regional and Local Policies and Plans

This statement simply summarizes certain existing policies. It proposes technical compliance with the requirement not to remove Bald Eagle perch trees without discussing the fact that such perch trees, when located in developed areas, no longer become perch trees. While the perch tree in question may not technically have been "removed" experience with the Eagle Point area suggests that the perch tree is nevertheless lost and therefore the policy behind the County requirements has been evaded. Further, the reliance on inadequate mitigation measures makes this report misleading and defective with respect to impacts Jeffery Pine Forest, Pebble Plain habitat and other native vegetation and wildlife. 26-19

19. Mitigation Measures

The measures proposed are inadequate and based on out-dated information. For example, the report states that a re-survey needs to be done after a 40% precipitation year. This means it can be done now and it should be. The suggested measure for eagle perch trees should be revised to require a "no-build" zone around at least all identified perch trees, which zone should, based on suggested zones in other measures, be at least 300 feet in diameter. The proponent should be prohibited from building paths for hiking in this zone, and required to fence it with appropriate materials that will allow wildlife to pass, but block hiking an recreational use. Likewise, restrictions on night lighting should be expanded to establish light-free zone for wildlife, which ideally should include the areas around perch trees.

26–20

For these and other reasons, the draft section of the report is an inadequate basis for an administrative decision and should be further revised.

26–21

Sincerely,

Peter J. Tennyson

Mary E. Tennyson

19 Monaco, Newport Beach, CA 92660

Response to Commentor No. 26
Peter and Mary Tennyson
April 15, 2005

26-1 Comment is noted.

26-2 The Pebble Plain Habitat Management Guide and Action Plan was developed in 1990 by the San Bernardino National Forest and the California Nature Conservancy to preserve pebble plain habitat on public lands. The plan was discussed in the Draft EIR section for informational purposes regarding current efforts to preserve this habitat and does not have any particular enforcement requirements for the project site.

26-3 Please refer to Responses to Comment Nos. 7-7 and 7-10.

26-4 Please refer to Response to Comment 3-1 (Leslie MacNair, California Department of Fish and Game) from the Draft EIR public review period, which occurred from March 30, 2004 to May 13, 2004.

26-5 Please refer to Responses to Comment Nos. 5-2 and 7-7.

26-6 Comment noted. The Draft EIR section assumed presence for all species with low, moderate, or high potential to occur on the site. The impact to foraging habitat for this species is considered less than significant due to the limited amount of habitat loss associated with the proposed project relative to the availability of habitat for this species in the region.

26-7 The wild turkey is not considered a special status species and, as such, would not receive additional attention in the Draft EIR section. A general impacts discussion is provided on page 5.8-54.

26-8 Mule deer, mountain lion, and coyote are not considered special status species and, as such, are not discussed under the special status species discussion of the Draft EIR section.

26-9 The Draft EIR section states that surveys for special status plants were inconclusive because they were conducted during an exceptionally dry year, necessitating an additional survey as required by Mitigation Measure 5.8-1a. Vegetation type acreages would be recalculated following focused plant surveys in accordance with Mitigation Measure 5.8-1a. Please see Table 5.8.3 for a table listing special status wildlife species potentially occurring within the project region.

26-10 Please refer to Responses to Comment Nos. 7-7, 7-10, and 7-23.

26-11 Please refer to Responses to Comment Nos. 6-2, 7-23, and 26-6. Mitigation Measure 5.8-1d is designed to avoid direct impacts to nesting activity on the site.

26-12 Please refer to Response to Comment No. 26-8.

26-13 Please refer to Response to Comment No. 7-9. Pebble plain habitat is restricted to the San Bernardino Mountains and does not occur in other parts of southern California.

26-14 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

26-15 Comment is noted. Lighting and glare affects have been evaluated in Section 5.2 of the Draft and Final EIR.

26-16 Comment is noted. Mitigation Measure 5.8-2d of the Draft EIR has been updated for the Final EIR as follows:

5.8-2d	Prior to ~~the issuance of individual building permits, landscaping designs~~ recordation of the final map, a landscaping plan for the entire tract shall be prepared (inclusive of a plant palette) with native trees and plant species, and, shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review shall determine that no non-native or invasive plant species are to be used in the proposed landscaping. The biologist should suggest appropriate native plant substitutes. A note shall be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform with the overall approved tract map landscaping plan. A requirement shall be included stating that residents shall include a restriction of the use of tree and plant species to only native trees/plants approved per the overall tract map landscaping plan, the Homeowner Association CC&Rs shall also restrict (individual lot owners) to use only native tree and plant species approved per the overall tract map landscaping plan.

26-17 Please refer to Response to Comment No. 26-4. The proposed project does not include perimeter walls or fences. Once the individual lots are created, the individual property owners could potentially install perimeter walls/fences.

26-18 The project site is considered to be a travel route between open space areas to the north of the project site and the Big Bear Lake. It is not considered a "Wildlife Corridor". Therefore, the proposed project would not impact wildlife corridors.

26-19 Please refer to Responses to Comment Nos. 6-2, 7-7, 7-9 and 7-10.

26-20 Comment is noted. Please refer to Responses to Comment Nos. 5-2 and 5-5.

26-21 Comment is noted.

COMMENT NO. 27

Bradley L. and Cathy Winch
PO Box 370
Fawnskin, CA 92333-0370

RECEIVED
APR 19 2005
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

Faxed to (909-387-3223) this 15th day of April at ~~3:30~~ 4:45 PM.
Printed letter sent by US Mail.

April 15, 2005
County of San Bernardino
Land Use Services Department, Planning Division
385 North Arrowhead Avenue 1st Floor
San Bernardino, California 92415-0182

Attn: Matthew Slowik, Sr. Assoc. Planner

RE: "REVISED BIOLOGICAL RESOURCES SECTION OF THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE MOON CAMP DEVELOPMENT PROJECT/RCK PROPERTIES INC.: GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE

FROM BV/RL-40 TO BV/RS-7200 AND AMENDMENT TO COUNTY CIRCULATION ELEMENT FOR REALIGNMENT OF NORTH SHORE DRIVE; TENTATIVE TRACT MAP #16136, AND CONDITIONAL USE PERMIT FOR A BOAT DOCK."

I. INTRODUCTION and SUMMARY

On behalf of myself and my wife, Cathy, we would like to thank the San Bernardino County Land Use Services Department Planning Division for the opportunity to comment on this Revised Biological Section of the Draft Environmental Impact Report for the proposed Moon Camp residential development project, General Plan amendment, land use district change, circulation amendment, tentative tract map and conditional use permit for a boat dock (collectively, DEIR).

My wife and I are residents of Fawnskin, California, and would be directly and adversely affected by the negative impacts to the biological resources of this area that would

27–1

result from the development of the proposed Moon Camp project. We chose to come to Fawnskin to live permanently just over one year ago -- after being part-timers for over 2 years -- because we wanted to continue to be surrounded by nature, as it currently exists here, and because of the current character of the town. We value those aspects of Fawnskin because one of us (Bradley) had those same surroundings where he grew up in a small town in Iowa. We feel that it is imperative to our rights and those of friends that we invite to visit us that the basic essence of this character be preserved. 27-1

My wife and I have studied the original EIR and the current DEIR and still are strongly opposed to this proposed Moon Camp development project because, even with the mitigations proposed in this revised biological resources section, this project would have extensive adverse effects on us, on the entire community of Fawnskin and on the Big Bear Valley environment as a whole.

This project goes against a large number of the goals set for the mountain areas in the County's own General Plan. T

Although an amendment to the General Plan to change the zoning is requested, there is no amendment currently proposed to change the general goals in the area of biological and natural resources. In order to maintain those goals and support the existing biological resources at this site and throughout the Big Bear Valley, we support the RL-40 designation of this property as it is currently zoned in the County's General Plan and strongly advocate that this designation be kept. From visitor information we have seen that was collected by the Discovery Center, we believe that much of the economic viability of this entire Valley depends on the maintenance of the native habitats and natural surroundings currently in existence. The adverse impacts to those habitats, and especially to the bald eagle, that would result from the development of this proposed project would, in our opinion, negatively affect the economic well-being of the entire Big Bear Valley.

27-1

In reviewing this revised Biological Section of the DEIR, my wife and I have found it to still be incomplete, inaccurate, and defective. The DEIR fails to adequately evaluate the severe adverse effects of the proposed project and grossly

downplays and understates the significant and unavoidable impacts that would be caused should it be approved. Our objections to this proposed project and the inadequacies of this revised Biological Resources section of the DEIR are set forth below. Please include this letter in its entirety as part of our formal CEQA comments to be included in the Environmental Impact Report.

In summary, we continue to object to this development project, as proposed, for the following reasons: 27-1

II. Biological Resources

The revised Biological Section of the DEIR still has provided an incomplete and inadequate evaluation of the impacts on Biological Resources that grossly underestimates the resulting impacts of this project.

- The Standard Conditions of Approval (SCA-1) does not specify that the replanting of trees must be native trees. Nor does it specify that the trees proposed to be planted be the same type of trees that are being removed. The 27-2

biological resources section does not evaluate the impact on the wildlife as a whole, or on the individual species of the area, for a change in the species of trees that exists on the site.

27–2

- Nothing has been mentioned or taken into account in this revised biological resources section that the bark beetle infestation has long passed its peak and that the removal of the dead trees and logs on the site to reduce the bark beetles could have adverse impacts on the other species in this area. The counterbalance of these has not been evaluated to make recommendations for finding a middle-ground for the long-term health of the area in all conditions.

27–3

- The percentage used to define the pebble plains habitat of this site as a portion of the total in existence has been grossly underestimated. According to the biological resources section itself, the special-status plants associated with the pebble plains habitat "were found to be widespread throughout an approximately 11.8 acre area of open Jeffrey pine forest with an herbaceous layer of Wright's matting buckwheat in the western half of the

27–4

Project site." There is no scientific evaluation or justification given for not including at a minimum the 11.8 acres or more accurately the "western half of the Project site" in the calculations for the size of the actual pebble plains habitat.

27-4

- Once again, since the entire "open Jeffery pine forest" as characterized in the document meets the habitat definition of pebble plains and supports special status species across 17.38 acres, the impact is not just 0.69 acres as considered in the analysis, but the entire 17.38 acres.

27-5

- Many of the pebble plains habitat areas in other parts of the Valley have been very recently and very extensively damaged and thus potentially reduced in size. No evaluation has been done on the actual size of the entire pebble plains habitat, and therefore on the actual percentage represented by this proposed development site, especially taking into account the large increase in off-road vehicle usage and resulting destruction of the existing habitat.

27-6

- No scientific justification is given to define neither 40% rainfall as being a sufficient basis for obtaining an accurate survey of the extent of the pebble plains habitat nor any justification given for surveys being valid with anything less than full and normal rainfall.

27–7

- No scientific justification is given to define neither 40% rainfall as being a sufficient basis for obtaining an accurate survey of the extent of the montane meadow habitat nor any justification given for surveys being valid with anything less than full and normal rainfall.

27–8

- Since it would be difficult if not impossible to find a willing seller of sufficient acreage of pebble plains and associated rare plant habitat to in any way mitigate the loss of the actual size of these habitats at the proposed project site, this mitigation measure (paragraph 2 of 5.8-1a) is impractical and inadequate.

27–9

- No mitigation measures have been defined to make up for the loss of montane meadow habitat with the development of this proposed project.

27–10

- No evaluations have been done to define how much of the total montane meadow habitat in the Valley would be lost with the development of this proposed project. **27–11**

- The special status plant species listed on page 5.8-48 of the revised biological resources section that are likely to exist at the site but that were not detectable during the surveys have not been adequately evaluated nor their potential loss accounted for in this DEIR. Since their numbers have not been determined, no determination as to the full impact to their total populations could have been determined, nor are there any requirements set for making up for their loss once their actual numbers and extent of range have been determined. **27–12**

- Given all of the above points, the mitigation measures defined in 5.8-1a are grossly inadequate and would not serve to reduce impacts to a less than significant level. **27–13**

- Since the extent of the pebble plains habitat has been inadequately evaluated and grossly underestimated, the **27–14**

evaluation of the potential impact to the special-status Andrews' marble butterfly is inadequate and could underestimate the significance of the impacts on this species. 27–14

- The analysis fails to evaluate the loss of a significant portion of the shoreline habitat for all the species that could be impacted, including not only shore-feeding species, but all species that use this portion of the shoreline for access to the lake. 27–15

- The mitigations proposed to protect the bald eagle habitat as proposed continue to be impractical and ineffective. Similar mitigations in other parts of the Valley have often not been enforced or regulated so that they, in the end, proved to be neither practical nor effective. 27–16

- This revised section fails to evaluate the adequacy of the special-status wildlife mitigations on the basis that similar bald eagle mitigations have been done in prior developments in the Big Bear Valley and when the mitigations were implemented, the bald eagle numbers have been significantly reduced over the past two decades, thus rendering the mitigations totally inadequate. **27–17**

- Once again, the potential removal of additional trees to support Section 5.3-1c mitigation for a 100-foot fuel modification is not analyzed anywhere in the Biological Resources section. **27–18**

- The DEIR still fails to include in the biological resources analysis the impact to wildlife based on increases in road-kill from the increased traffic nor from the proposed highway realignment. **27–19**

- The evaluation of impacts to bald eagles fails to take into account that the eagles now can see the shoreline from the trees identified as bald eagle perches. There is neither **27–20**

mention nor evaluation of the increased impacts when the views from those perch trees are degraded extensively by the visually obstructive intrusion of homes built between the trees and the shoreline.

27–20

- Neither mention nor evaluation has been done on the larger-range impacts to the entire population of Southern California wintering bald eagles. The bald eagle numbers in Southern California have been declining in spite of what's happening in other areas of the country. One of the only potential ways for this population to begin recovering is to increase the chances of these populations actually nesting in Southern California. This habitat on the north Shore of Big Bear Lake is some of the last remaining likely areas for this nesting to occur and thus, this proposed project will very likely negatively impact the chances for overall recovery of the bald eagle populations in Southern California.

27–21

- No evaluation has been done on whether the drought in this area could have affected the existence of the wildlife on this site and whether more wildlife would be likely to be

27–22

found at the site during years of normal rainfall. Therefore, the evaluation of the impact on all wildlife, including but not limited, to the yellow-blotched salamander, the silvery legless lizard, the southern rubber boa, the San Bernardino Mountain Flying Squirrel, and all species of bats is inadequate and potentially understated.

27–22

- The adverse impacts on the biological resources that would result from the development of this project would spread out to affect other arenas, such as the economy of the valley and the economic viability of its current dependence on tourism. None of these impacts have been evaluated in this section or throughout the remainder of the DEIR.

27–23

This revised biological resources section analysis continues to be inaccurate and inadequate and grossly understates the level of significance of the impacts regarding wildlife and plants that would be caused by this proposed project. It especially continues to underestimate the significant impacts on bald eagles and both the pebble plains and the montane meadow habitats.

27–24

III. CONCLUSION

My wife and I believe that, since a section of this DEIR was revised, the entire document must be circulated once again so that the changes and how they apply from one section to another can be properly evaluated and the public and the decision-makers can be properly informed prior to making any decision on this project, as required by law. 27–25

We again formally request timely notification in advance of all meetings, documents, and decisions regarding this proposed project. 27–26

The Revised Biological Resources section of the Draft EIR, and thus the DEIR as a whole, for the proposed Moon Camp Project currently in circulation is incomplete, inaccurate and defective and must be rejected in its present form. It has failed to adequately assess the level of significance of the adverse impact on biological resources. Furthermore, multiple significant impacts continue to understate and sugar coat the project in a thinly-veiled attempt to convince the Board of Supervisors to approve this 27–27

project with overriding considerations. The project, on the basis of the present proposal, is so entirely contrary to the guidelines of the County's General Plan and the best interest of the tax-paying public that it warrants nothing less than a categorical denial. We urge the Board to carefully evaluate this project and select the No Project Alternative in the interest of the Public Trust.

27-27

Respectfully submitted,

Bradley L. Winch, Ph.D., J.D. and Cathy Winch

Residents of Fawnskin

Response to Commentor No. 27
Bradley and Cathy Winch
April 15, 2005

27-1 Please refer to Response to Comment No. 7-1.

27-2 Please refer to Response to Comment No. 7-2.

27-3 Please refer to Response to Comment No. 7-3.

27-4 Please refer to Response to Comment No. 7-4.

27-5 Please refer to Response to Comment No. 7-5.

27-6 Please refer to Response to Comment No. 7-6.

27-7 Please refer to Response to Comment No. 7-7.

27-8 Please refer to Response to Comment No. 7-8.

27-9 Please refer to Response to Comment No. 7-9.

27-10 Please refer to Response to Comment No. 7-10.

27-11 Please refer to Response to Comment No. 7-11.

27-12 Please refer to Response to Comment No. 7-12.

27-13 Please refer to Response to Comment No. 7-13.

27-14 Please refer to Response to Comment No. 7-14.

27-15 Please refer to Response to Comment No. 7-15.

27-16 Please refer to Response to Comment No. 7-16.

27-17 Please refer to Response to Comment No. 7-17.

27-18 Please refer to Response to Comment No. 7-18.

27-19 Please refer to Response to Comment No. 7-19.

27-20 Please refer to Response to Comment No. 7-20.

27-21 Please refer to Response to Comment No. 7-21.

27-22 Please refer to Response to Comment No. 7-22.

27-23 Please refer to Response to Comment No. 7-23.

27-24 Please refer to Response to Comment No. 7-24.

27-25 Please refer to Response to Comment No. 7-25.

27-26 Please refer to Response to Comment No. 7-26.

27-27 Please refer to Response to Comment No. 7-27.

27-28 Please refer to Response to Comment No. 7-28.

COMMENT NO. 28

P.O. Box 409
Fawnskin, CA 92333
April 15, 2005

County of San Bernardino
Land Use Services Department
Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA 92415-0182

Attention: Mr. Matthew W. Slowik

Re: Mooncamp Development Project/RCK Properties Inc. Draft Biological section Recirculation

FAX: (909) 387-3223

Dear Mr. Slowik:

We received notification of the revised biological section of the draft EIR for the Mooncamp development project/RCK Properties Inc., and have very significant concerns about this revised version. For example:

1. How can it be guaranteed that there will be offsite mitigation regions available for pebble plains habitat? 28-1

2. Why would plant surveys be carried out at a time of 40% of normal rainfall, rather than for normal rainfall? 28-2

3. This revised draft again indicates that there will be significant impact on bald eagle habitat, which is particularly important when cumulative impacts are taken into account.

The overall draft EIR now indicates that there will be substantial negative impacts that cannot be mitigated in a number of areas, including air quality and biological impacts. Visitors come to our valley for the clean air, beautiful scenery and wildlife, and destruction of these important quality of life issues will have significant and irreversible negative economic impacts on this resort community. We hope that the Supervisors will not therefore judge that there are overriding economic considerations for approving the rezoning and this development, as it will have the opposite effect on all but the developers themselves. 28-3

Yours truly,

B. J. Finlayson-Pitts, Ph.D.

James N. Pitts, Jr., Ph.D.

Response to Commentor No. 28
B.J. Finlayson-Pitts and James Pitts
April 15, 2005

28-1 Please refer to Response to Comment No. 7-9.

28-2 Please refer to Response to Comment No. 7-7.

28-3 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

COMMENT NO. 29

Michael Karp
P.O. Box 1653
Big Bear Lake, CA 92315

County of San Bernardino
Land Use Services Department, Planning Division
385 N. Arrowhead Ave, First Floor
San Bernardino, CA 92415-0182
Attn: Matthew W. Slowik Fax: 909 387-3223

Concerning: MOONCAMP DEVELOPMENT PROJECT/RCK PROPERTIES, INC. DRAFT EIR BIOLOGICAL SECTION RECIRCULATION.

Dear Mr. Slowik:

I understand that the above project is about to come before the County Planning Commission and/or Board of Supervisors. I have some concerns that echo the findings of the DEIR:

- What scientific basis is there for using 40% of normal rainfall as the time when they do another plant survey? Why shouldn't it be done with normal rainfall? **29–1**
- It is very unlikely that there is a place available that they can purchase for offsite mitigation for pebble plains habitat, so this is not a satisfactory mitigation. **29–2**
- The impact on bald eagles has been determined to be significant. In fact, the DEIR states, "The proposed project contains some of the most utilized bald eagle roosting and perching habitat in the Big Bear Valley. Construction of the proposed project would diminish the habitat value of the project site for the species. When viewed in conjunction with other past, present, and reasonably foreseeable developments planned for the Fawnskin/Big Bear Lake area, the loss of bald eagle perch and roosting trees on the project site would significantly impact bald eagle habitat on the north shore of Big Bear Lake." **29–3**
- "As a result, cumulative impacts to the bald eagle are considered significant. Mitigation measures reflective of recommendations developed by scientific studies in the Big Bear Valley, including Kimball Garrett's study on the effects of human activity on wintering bald eagles (1981), are provided as part of the proposed project. However, implementation of these mitigation measures would not reduce direct or cumulative impacts to bald eagle habitat to a level considered less than significant." **29–4**
- To approve this project the Supervisors would have to cite overriding considerations. Since this project would take a general plan amendment for a change in the existing zoning, there can be no overriding considerations that justify this negative impact on the wintering bald eagle population in Big Bear. **29–5**

Since the economy of the Big Bear Valley depends upon nature, recreation and the existence of the bald eagle here, there would most likely be economic harm to the entire valley if this project were approved. I therefore request that this project *not* be approved as written. **29–6**

Sincerely,

Michael Karp

Response to Commentor No. 29
Michael Karp
April 16, 2005

29-1 Please refer to Response to Comment No. 7-7.

29-2 Please refer to Response to Comment No. 7-9.

29-3 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

29-4 Comment is noted. Environmental considerations noted by the Commentor have been addressed in the Draft and Final EIR.

29-5 Comment is noted.

29-6 Comment is noted.

FINAL

December 2005

Moon Camp Residential Subdivision TT No. 16136 EIR Technical Appendices

Lead Agency:

County of San Bernardino

Prepared by:

RBF Consulting

Administrative Draft EIR Completed: August 23, 2002
Public Review Draft EIR Completed: March 23, 2004
Final EIR Completed: December, 2005

F I N A L
ENVIRONMENTAL IMPACT REPORT
TECHNICAL APPENDICES

MOON CAMP
RESIDENTIAL SUBDIVISION
TENTATIVE TRACT NO. 16136

SCH NO. 2002021105

Lead Agency:

COUNTY OF SAN BERNARDINO
385 N. Arrowhead Avenue, Third Floor
San Bernardino, California 92415-0182
Contact: Mr. Matt Slowik, Senior Associate Planner
909.387.4371

Prepared by:

RBF CONSULTING
14725 Alton Parkway
Irvine, California 92618-2069
Contact: Mr. Glenn Lajoie, AICP
949.472.3505

December 2005

JN 10-101901

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15.12 Correspondence

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LAND USE SERVICES DEPARTMENT

COUNTY OF SAN BERNARDINO
ECONOMIC DEVELOPMENT
AND PUBLIC SERVICES GROUP

PLANNING DIVISION
385 North Arrowhead Avenue • San Bernardino, CA 92415-0182 • (909) 387-4131
First Floor Fax (909) 387-3249 • Third Floor Fax (909) 387-3223
15505 Civic Drive • Victorville, CA 92392 • (760) 243-8245 • Fax (760) 243-8212
http://www.co.san-bernardino.ca.us/landuseservices

MICHAEL E. HAYS
Director of Land Use Services

February 20, 2002

To: Responsible and Trustee Agencies

RE: NOTICE OF PREPARATION OF ENVIRONMENTAL IMPACT REPORT FOR RCK PROPERTIES, INC. APPLICATION FOR TENTATIVE TRACT MAP 16136, A GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE, AND A CONDITIONAL USE PERMIT ON APPROXIMATELY 62 ACRES LOCATED IN THE UNINCORPORATED COMMUNITY OF FAWNSKIN

The San Bernardino County Land Use Services Department will be coordinating the preparation of an Environmental Impact Report (EIR) for the RCK Properties, Inc. application for Tentative Tract Map 16136, a General Plan Amendment/Official Land Use District Change from BV/RL-40 (Rural Living, 40-acre minimum lot size) to BV/RS (Single Residential), and a Conditional Use Permit for a boat dock on approximately 62 acres located in the unincorporated community of Fawnskin. The site is on the north shore of Big Bear Lake, on State Highway 38, between Canyon Road and Polique Canyon Road. Tract Map 16136 includes a 95-lot residential subdivision. The project includes 92 numbered lots and 3 lettered lots on the north shore of Big Bear Lake. As part of the proposed project, roads will be constructed and utilities will be installed. Lots will be individually sold and developed by custom design.

The Environmental Checklist Form (Initial Study), completed September 5, 2001, identified the potential for significant impacts relative to the issue areas as follows: Aesthetics, Air Quality, Biological Resources, Cultural Resources, Geology/Soils, Hazards & Hazardous Materials, Hydrology / Water Quality, Land Use/Planning, Noise, Population/Housing, Recreation, Transportation/Traffic, and Utilities/Service Systems. The Initial Study serves to focus the scope of the EIR. A copy of the Initial Study is enclosed for your review.

This letter is a request for environmental information that you or your organization believes should be addressed in the EIR. Due to time limits, as defined by the California Environmental Quality Act (CEQA), your response should be sent at the earliest possible date, but no later than thirty (30) days after publication of this notice. Comments and questions may be directed to Tracy Creason, Senior Associate Planner, 385 North Arrowhead Avenue, San Bernardino, CA 92415-0182.

In addition to receiving written comments, the Land Use Services Department will be conducting a public scoping meeting from 10:00 a.m. to noon on March 2, 2002. The meeting will be held at the North Shore Elementary School, which is located at 765 North Stanfield Cutoff in Big Bear Lake.

Sincerely,

Tracy Creason

TRACY CREASON, Senior Associate Planner
Advance Planning Division

Enclosures: Initial Study
Distribution List

WILLIAM H. RANDOLPH
County Administrative Officer

JOHN GOSS
Assistant County Administrator
Economic Development and
Public Services Group

Board of Supervisors
BILL POSTMUS ..... First District
JON D. MIKELS ..... Second District
JERRY EAVES ..... Fifth District
DENNIS HANSBERGER ..... Third District
FRED AGUIAR ..... Fourth District

MOON CAMP
MASTER NOP 2-02
Mooncamp NOP mlg lbs.doc
Revised 2-20-02

U. S. FISH & WILDLIFE SERVICE
ATTN: P. J. WHITE
Carlsbad Field Office
2730 Loker Ave., West
Carlsbad, CA 92008

U. S. FOREST SERVICE
Forest Supervisor's Office
1824 S. Commerce Center Circle
San Bernardino, CA 92408-3430

U. S. FOREST SERVICE
Big Bear Ranger District
P. O. Box 290
Fawnskin, CA 92333-0290

U. S. Army Corps of Engineers
Operations Branch
P. O. Box 2711
Los Angeles, CA 90053

U. S. Army Corps of Engineers
ATTN: ANTAL SZIJJ
32330 Santa Ana Canyon Road
Highland, CA 92346

Howard Wilshire
3727 Burnside Road
Sebastopol, CA 95472

CA Dept. of Fish & Game
4775 Bird Farm Road
Chino Hills, CA 91709

CA Division of Forestry
3800 Sierra Way
San Bernardino, CA 92405

CAL TRANS
CEQA/IGR Coordinator
Dept. of Trans. Planning
464 W. 4th St., 6th Floor
San Bernardino, CA 92401-1400

CA State Highway Patrol
2211 Western Avenue
San Bernardino, CA 92411

SCAG
818 W. 7th St., Suite 1200
Los Angeles, CA 90017

South Coast AQMD
ATTN: STEVE SMITH
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

CA RWQCB/Santa Ana Region
3737 Main St., Suite 500
Riverside, CA 92501-3339

San Bernardino County
Public Health Dept.
Div. of Env. Health Svcs.
0160

San Bernardino County
County Geologist
0181

San Bernardino County
Bldg. & Safety 0181

San Bernardino County
County Fire Dept. – Haz Mat 0153

San Bernardino County
Public Works
Env. Mgmt. Division
0835

San Bernardino County
Public Works
Env. Mgmt. Division-Flood Control
District
0835

San Bernardino County
Public Works
Env. Mgmt. Division-Land Development
0835

San Bernardino County
Public Works
Env. Mgmt. Division-Surveyor
0835

San Bernardino County
Public Works
Traffic Division
0835

San Bernardino County
ATTN: BOB MC KERNAN
Biological Resources
Museum - 0065

San Bernardino County
Arch Info Center
Museum – 0065

San Bernardino County
Fire Dept. – 0179

San Bernardino County
Regional Parks – 0763

San Bernardino County
Sheriff's Dept. – 0061

San Bernardino County
LAFCO – 0490

San Bernardino County
Special Districts – 0450

San Bernardino County
ATTN: LORI PANZINO
Special Districts – 0450

San Bernardino County
Supervisor Dennis Hansberger
BOS - 0110

SANBAG
472 N. Arrowhead Avenue
San Bernardino, CA 92401

City of Big Bear Lake
DWP
P. O. Box 1929
Big Bear Lake, CA 92315-1929

Southern CA Gas Co.
Construction Planning
Inland Empire Region
1981 West Lugonia Avenue
Redlands, CA 92373

Edison International
ATTN: PLANNING DEPT.
287 Tennessee Street
Redlands, CA 92373

Big Bear CSD
ATTN: C. BARDOWELL
SOLID WASTE ADMIN.
P. O. Box 558
Big Bear City, CA 92314

Big Bear Muni Water Dist.
P. O. Box 2863
Big Bear Lake, CA 92315

Big Bear Area Regional
Wastewater Agency (BBARWA)
ATTN: DONNA REPP
P. O. Box 517
Big Bear City, CA 92314

Katie Barrows
CA Native Plant Society
53298 Avenida Montezuma
La Quinta, CA 92253

Peter J. Kiriakos
Sierra Club – San Gorgonio Chapter
29421 Sunharbor Court
Lake Elsinore, CA 92530

SOFA
ATTN: LARRY BROWN
P. O. Box 22
Lake Arrowhead, CA 92352

Dan Silver, Coordinator
Endangered Habitats League
8424-A Santa Monica Blvd., #592
Los Angeles, CA 90069-4267

Big Bear Lake Department of
Water & Power
41972 Garstin Road
Big Bear Lake, CA 92315

City of Big Bear Lake
ATTN: PLANNING DIRECTOR
P. O. BOX 2800
Big Bear Lake, CA 92315

Redlands Water Department
P. O. Box 2090
Redlands, CA 92373

Bear Valley Unified Schools
ATTN: RUDY F. MACIOGE
P. O. BOX 1529
Big Bear Lake, CA 92315

County Library
Big Bear Lake
14930 Garstin Drive
Big Bear Lake, CA 92315

County Fire CSA 53B
Mtn. Battalion (West) Stn 49
P. O. Box 371
Fawnskin, CA 92333

U. S. Post Office
39132 Northshore Drive
Fawnskin, CA 92333
(no initial study sent)

Northshore Café
ATTN: BARBARA & RICHARD
ORTIZ
P. O. Box 367
Fawnskin, CA 92333
(no initial study sent)

Urban Environs
ATTN: PAT MEYER
133 E. Vine
Redlands, CA 92373

RBF Consulting
ATTN: GLENN LAJORE
14725 Alton Pkwy.
Irvine, CA 92618-2027

SAN BERNARDINO COUNTY
INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

This form and the descriptive information in the application package constitute the contents of an Initial Study pursuant to County Guidelines under Ordinance 3040 and Section 15063 of the State CEQA Guidelines.

RECEIVED

FEB 19 2002

RBF CONSULTING

USGS Quad: Fawnskin, 7.5 Minute Series
T,R,Section: T2N, R1W, Section 13, SBBM
Thomas Bros: Pg 4741, C6 and D6, 2000 ed.
Planning Area: Big Bear Lake
Community: Bear Valley (Fawnskin)/S-3
OLUD: BV/RL-40, Improvement Level: IL1

PROJECT DESCRIPTION:

1. **Project Title:** General Plan Amendment/Official Land Use District Change, Conditional Use Permit and Tentative Tract No. 16136 ("Moon Camp")

2. **Lead Agency Name and Address:**
   County of San Bernardino
   Land Use Services Division
   385 North Arrowhead Avenue
   San Bernardino, CA 92415

3. **Contact person and phone number:**
   Mike Williams
   (909) 387-4168

4. **Project location:** In the North ½ of Section 13, T2N, R1W, SBBM, Fawnskin, California
   (APN: 0304-082-14, 0304-091-12, 13, and 21)

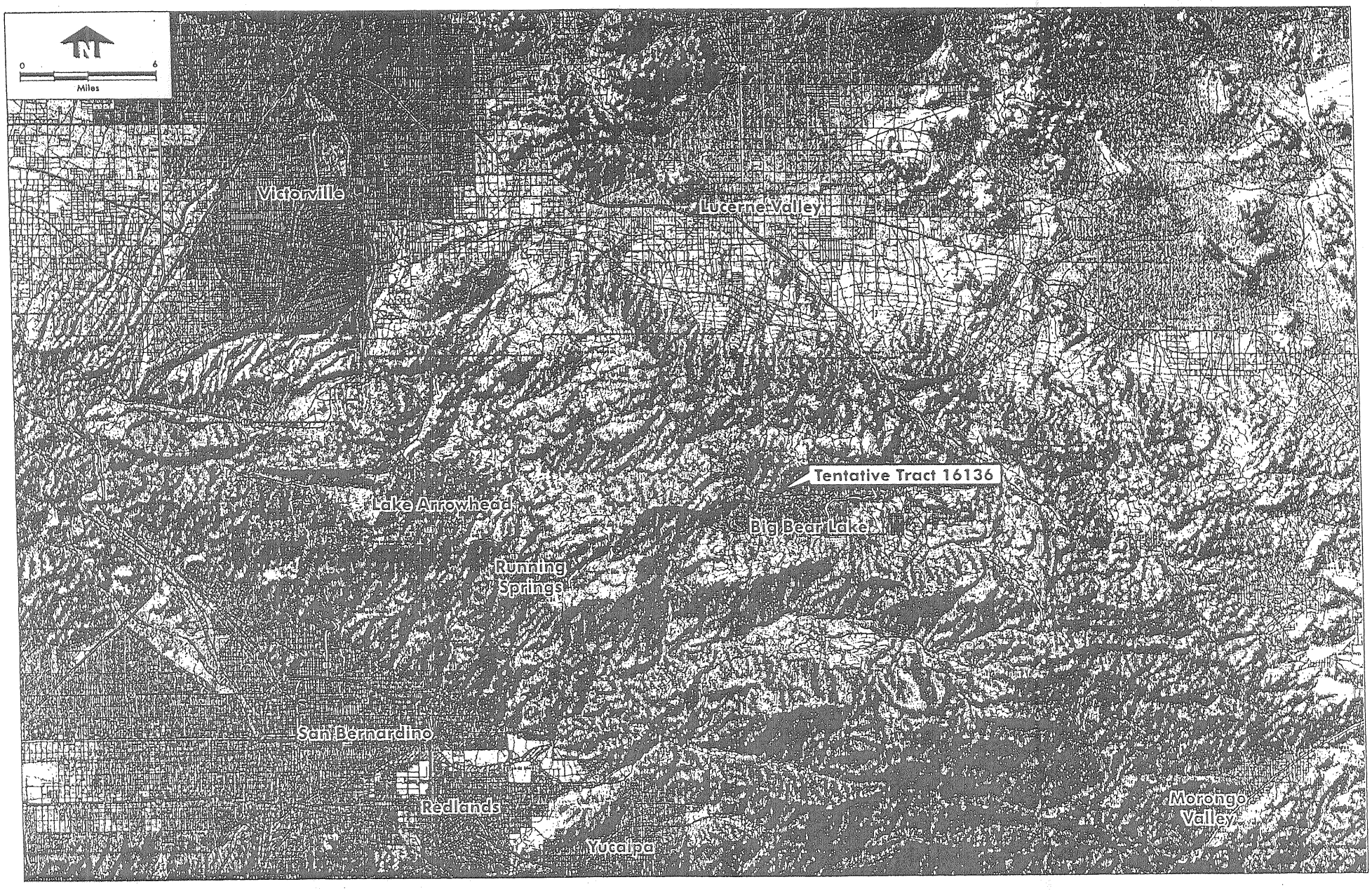
5. **Project sponsor's name and address:**

   RCK Properties, Inc.
   P.O. 7104
   Big Bear Lake, CA 92315
   Attn: Mr. Mike Rafferty

6. **Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary support, or offsite features necessary for its implementation.**

PROJECT SUMMARY:

The project proposed by RCK Properties, Inc. in Big Bear, is a 95-lot residential subdivision (Tentative Tract No. 16136) on the north shore of Big Bear Lake, in the community of Fawnskin, County of San Bernardino (see Figure 1). The project site is approximately 62.43 acres, located more specifically in the north ½ of Section 13, Township 2 North, Range 1 West, San Bernardino Base and Meridian (see Figure 2). The proposal is a tentative tract map for 92 numbered and 3 lettered lots (see Figure 3). Roads will be graded only and utilities will be installed. Lots will be sold individually and development of lots and construction of homes will be by custom design. Numbered lots will range in size between 0.17 acres (7,292 square feet) to 2.11 acres.

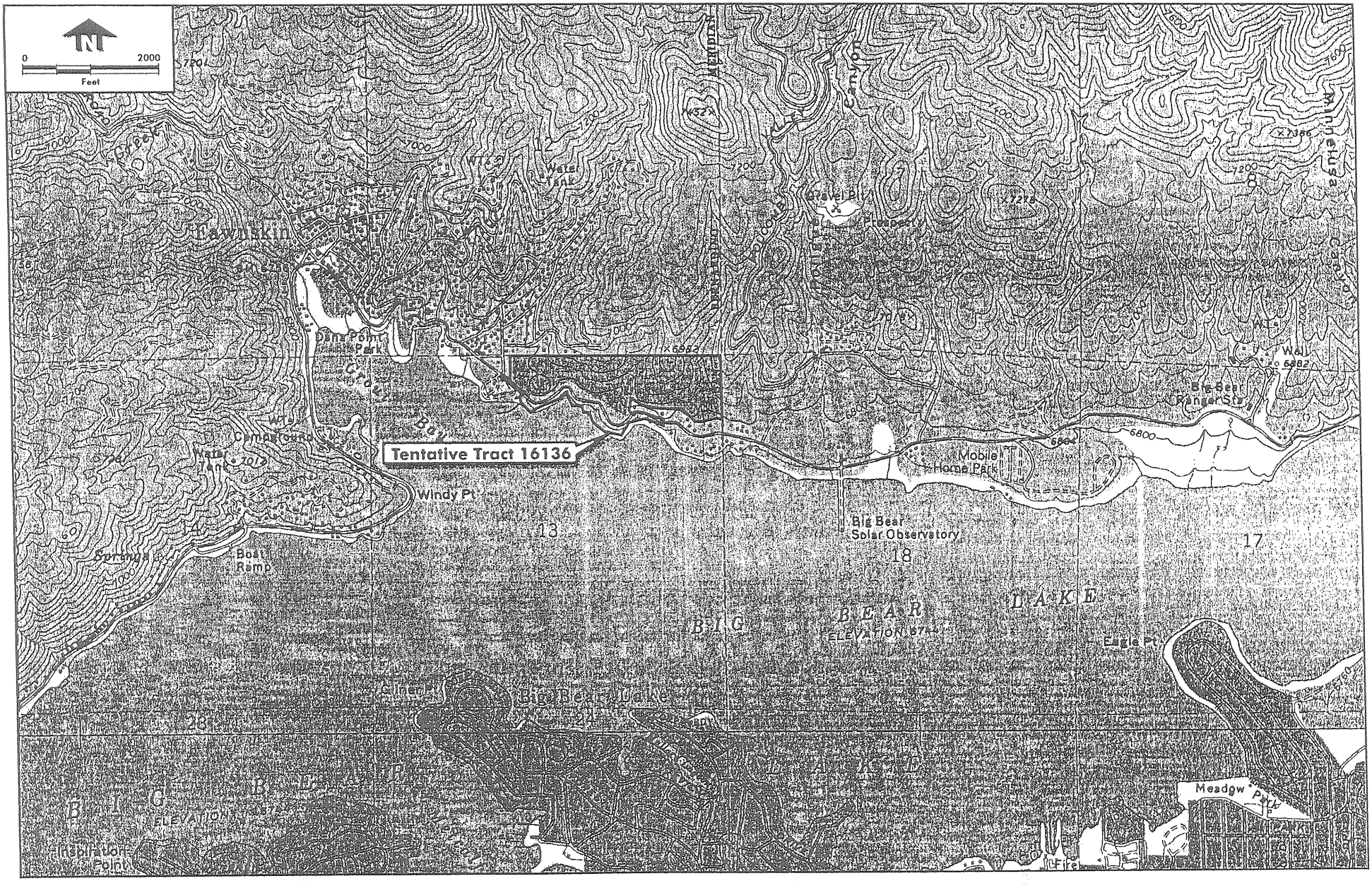


Regional Location Map

Tentative Tract 16136, "Moon Camp"
Fawnskin, County of San Bernardino

LILBURN CORPORATION

Figure 1

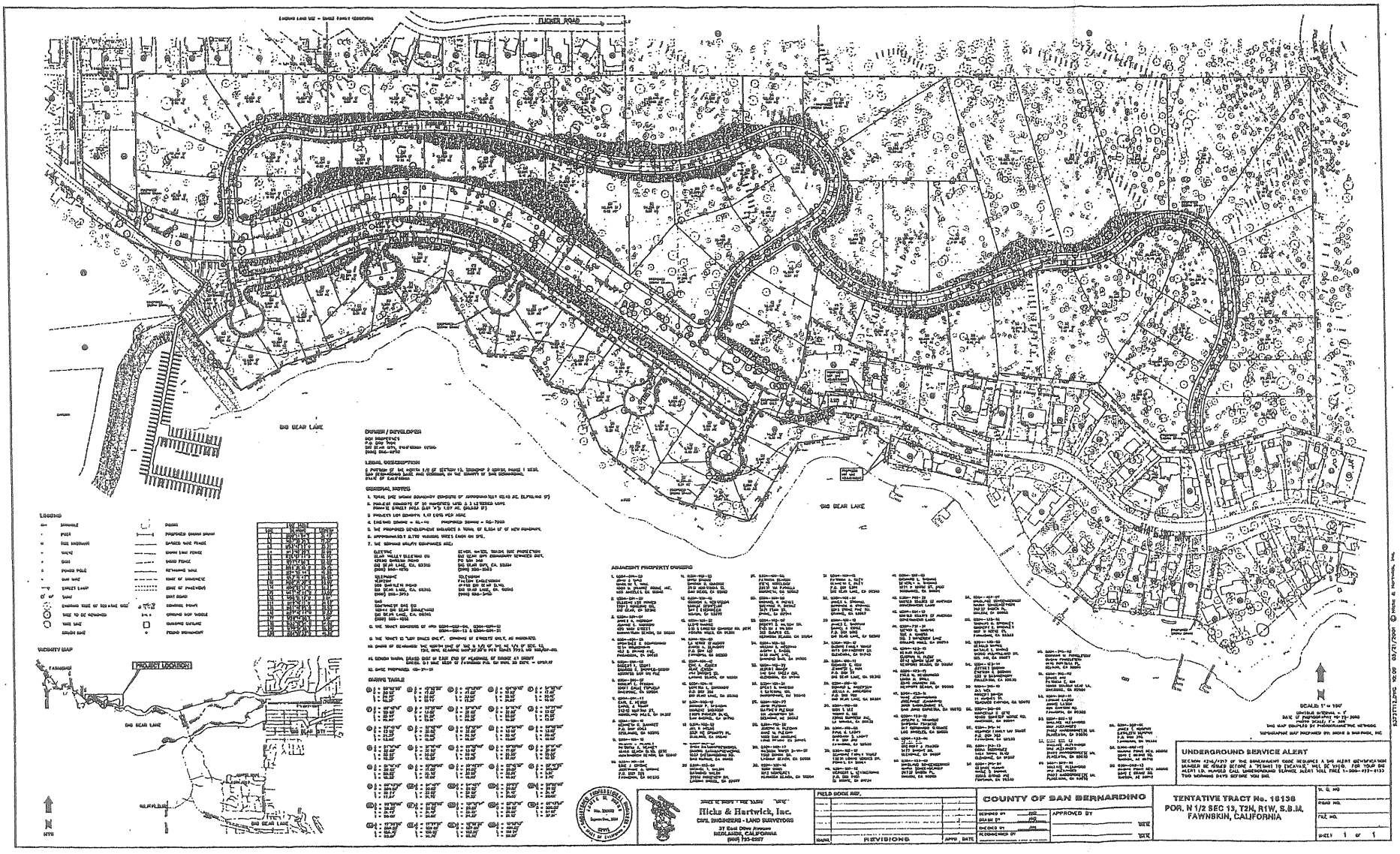


USGS Map

Tentative Tract 16136, "Moon Camp"
Fawnskin, County of San Bernardino

LILBURN CORPORATION

Figure 2



Tentative Tract Map 16136

Tentative Tract 16136, "Moon Camp"
Fawnskin, County of San Bernardino

LILBURN CORPORATION

Figure 3

The three lettered lots are identified as follows: Lot "A" is the private street designed to provide access to the southernmost lots; Lot "B" is the 1.4-acre strip of land that will remain between the relocated State Highway 38 and the private street Lot "A"; and Lot "C" is the gated entrance to the project including a proposed boat dock (southwest corner of the property) that would be available for use by residents of the tract and accessible by Lot "C". The boat dock will include slips for approximately 100 boats (dependent upon demand).

The project includes a General Plan Amendment/Official Land Use District Change from BV/RL-40 Rural Living (40-acre minimum lot size) to BV/RS (see Figure 4). State Highway 38 (North Shore Drive) extends through the southerly portion of the site; the proposal also includes the relocation of approximately 2,498 feet of Highway 38 to the north (see Figure 5) and therefore an Amendment to the Circulation Element of the County General Plan will also be required. The maximum distance of relocation as designed is 207 feet to the north, to allow for the development of lake front lots. Access to the project would be from State Highway 38 with access locations onto one private road and one public road within the subdivision. The internal circulation system was evaluated with a maximum volume of approximately 400 vehicles per day, satisfactory for a two-lane road.

Purpose and Need For The Project:

The project will provide for up to 92 single-family residential lots to be developed, as custom lots, in the future. This is one of the few remaining, developable, lakefront properties in the community of Fawnskin.

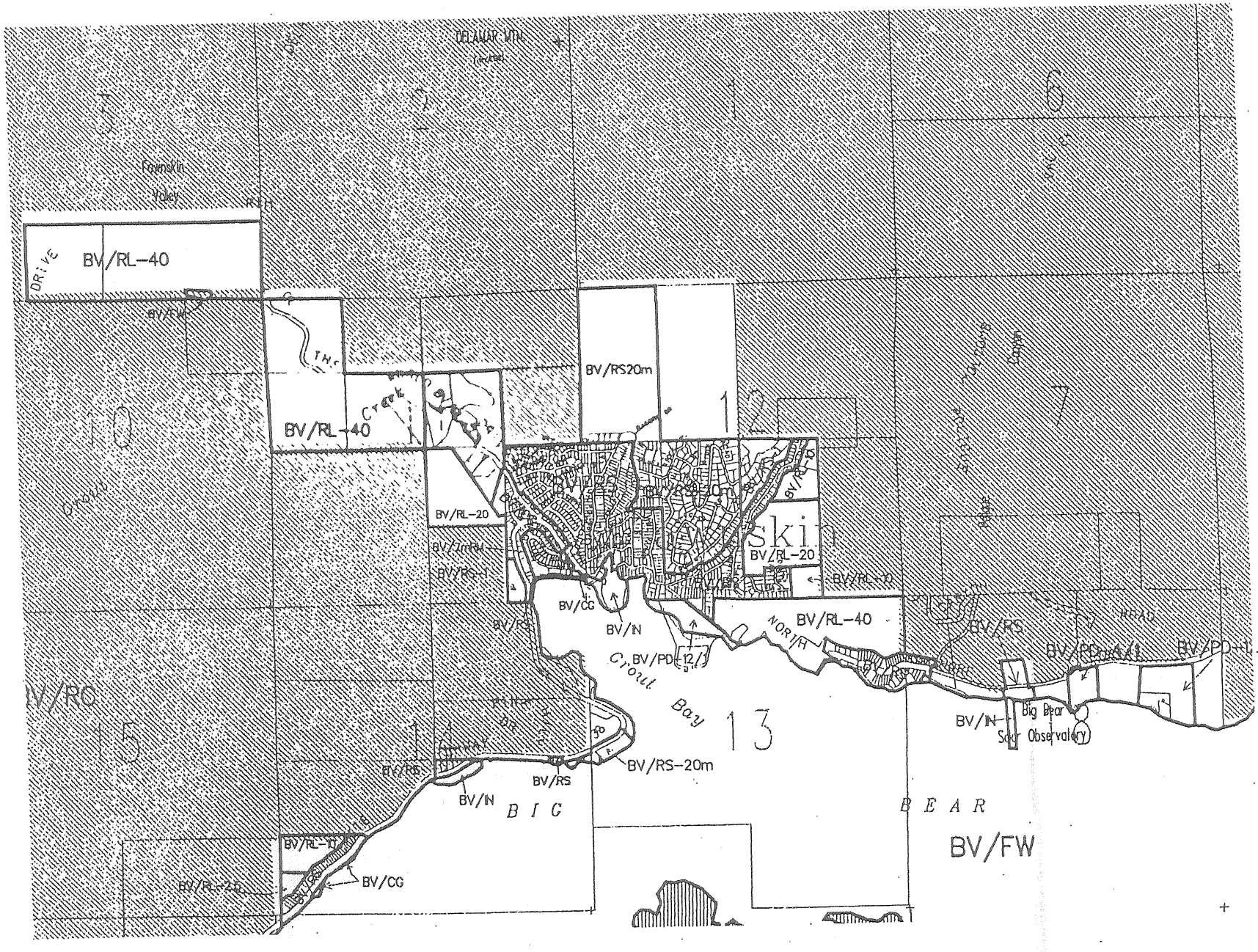
PROJECT IMPLEMENTATION:

To implement this project, the Applicant will need to obtain the following permits/approvals:

- Big Bear Municipal Water District – Boat Dock Permit
- Caltrans – Project Study Report (PSR) and Traffic Impact Study (TIS) for SR 38 Encroachment Permit
- County of San Bernardino Board of Supervisors –Approval of the General Plan Amendment (for land use and Circulation Element), Conditional Use Permit for Marina Parking Lot, Tentative Tract Map, and Certification of the Environmental Impact Report
- California Department of Fish & Game -1603 Streambed Alteration Agreement
- California State Water Resources Control Board – General Storm Water Permit for Construction and Storm Water Pollution Prevention Plan (SWPPP)
- California Regional Water Quality Control Board – Clean Water Act Section 401 Permit
- U.S. Army Corps of Engineers – Clean Water Act Section 404 Permit
- California Division of Forestry – Timber Harvest Plan (THP)

ENVIRONMENTAL/EXISTING SITE CONDITIONS:

The project site is adjacent to the north shore of Big Bear Lake in the relatively undeveloped eastern portion of Fawnskin. The property lies between Canyon Road to the west and Polique Canyon Road to the east, and Flicker Road to the north. The site is gently sloping from south to north and is vegetated in Jeffrey pine forest. Pebble plain (a unique plant community) habitat occurs in scattered patches in the western portion of the property. Existing residential properties are to the southeast, along the north and south side of Highway 38, further to the east and east of Polique Canyon Road, and to the west and north off of Canyon Road, Flicker Road, Deer Trail Lane and Canyon Road. Highway 38 is the only existing improvement on the property; dirt roads and trails traverse the property. Elevations range from 6,747 feet at the lakefront to a high of 6,960 at the



County Official Land Use Districts

Tentative Tract 16136, "Moon Camp"
Fawnskin, County of San Bernardino

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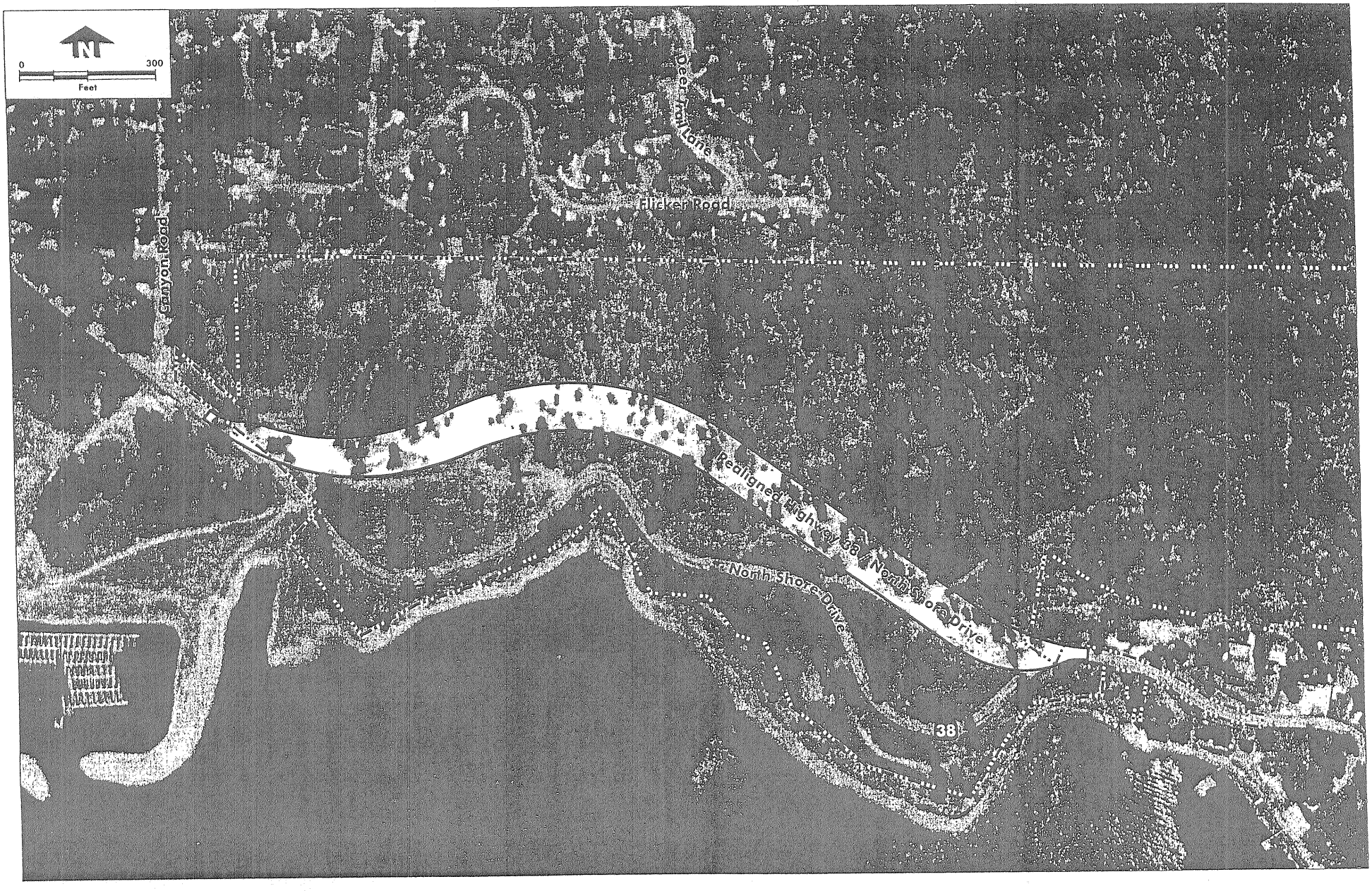
Figure 4



Highway 38 Realignment

Tentative Tract 16136, "Moon Camp"
Fawnskin, County of San Bernardino

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Figure 5

northeast boundary. Total relief is therefore 483 feet and slopes range from 5 percent to 40 percent*(Geologic Feasibility Report,RGS Geosciences, May 3, 2001)*. A natural drainage occurs in the eastern portion of the project site, flowing from north to south; the drainage is mapped on the USGS Fawnskin 7.5 minute quadrangle. Other small drainage courses occur throughout the site. The property is an inholding within the boundaries of the U.S. National Forest but is not owned by the U.S. Forest Service and therefore requires no permitting by the USFS. The property, also known as Moon Camp, currently provides for public access to both the lakeshore and forest *(Communications with USFS, San Bernardino Office, August, 2001)*.

SURROUNDING LAND USES:

Surrounding current land uses include residential and recreational (lake and forest) (refer to Figure 6). Land use designations are:

	EXISTING LAND USE	OFFICIAL LAND USE DISTRICT	IL
Project Site	Vacant	BV/RL-40	IL5
North	Forest Residential (NW)	BV/RC, BV/RL-40, and BV/RS	IL1 & IL5
South	Big Bear Lake, Residential (SE)	BV/FW, BV/RS	IL1
East	Vacant, Residential (SE)	BV/RC,BV/RS	IL1 & IL5
West	Vacant, Residential	BV/PD-12/1,BV/RS	IL1

IL Infrastructure Improvement Level – Levels range from 1 to 5 and are tied to the availability of the basic infrastructure required for development (roads, water and wastewater). IL-1 represents the most intense urban areas before development can be permitted to the degree allowed by a site's official land use designation, existing and planned infrastructure must be in place at levels consistent with the designated IL areas. Typical lot sizes for IL-1 is less than ½ acre

BV/RC Resource Conservation
BV/RS Single Residential
BV/RL-40 Rural Living (40-acre min. lot size)
BV/PD-12/1 Planned Development (12 units/acre)
BV/FW Floodway

County Development Code References for the above land uses are summarized as follows:

Planned Development: Allows for row, field, tree and nursery crop cultivation; single dwelling unit; social care facility and animal raising. Minimum lot size is 40 acres - map suffix allows lot size less than 40 (e.g. PD-12/1 = Planned Development – 12-units/acre).

Rural Living: Allows for row, field, tree and nursery crop cultivation; single dwelling unit; social care facility and animal raising. Minimum lot size is 2.5 acres

Single-Family Residential: Allows for row, field, tree and nursery crop cultivation; single dwelling unit; and social care facility.

Resource Conservation: Allows for row, field, tree, and nursery crop cultivation; single dwelling unit, social care facility, and animal raising. Minimum lot size is 40 acres.

Floodway: Uses only permitted where the property owner understands that the use is placed at their own risk and that it shall not obstruct and/or deflect flows onto other property.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☒ Aesthetics	☐ Agriculture Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Geology /Soils
☒ Hazards & Hazardous Materials	☒ Hydrology / Water Quality	☒ Land Use/ Planning
☐ Mineral Resources	☒ Noise	☒ Population / Housing
☐ Public Services	☒ Recreation	☒ Transportation/Traffic
☒ Utilities / Service Systems	☒ Mandatory Findings of Significance	

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation, the following finding is made:

☐ The proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ Although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ The proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ The proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ Although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Mike Williams — Signature (prepared by)

9/4/01 — Date

Julie M. Lynn — Signature
For Land Use Services Director

9/5/01 — Date

EVALUATION OF ENVIRONMENTAL IMPACTS

Pursuant to Section 15063 of CEQA Guidelines, an explanation is required for all "Potentially Significant Impact," "Potentially Significant Impact Unless Mitigation Incorporated," and "Less Than Significant Impact" answers, including a discussion of ways to mitigate the significant effects identified.

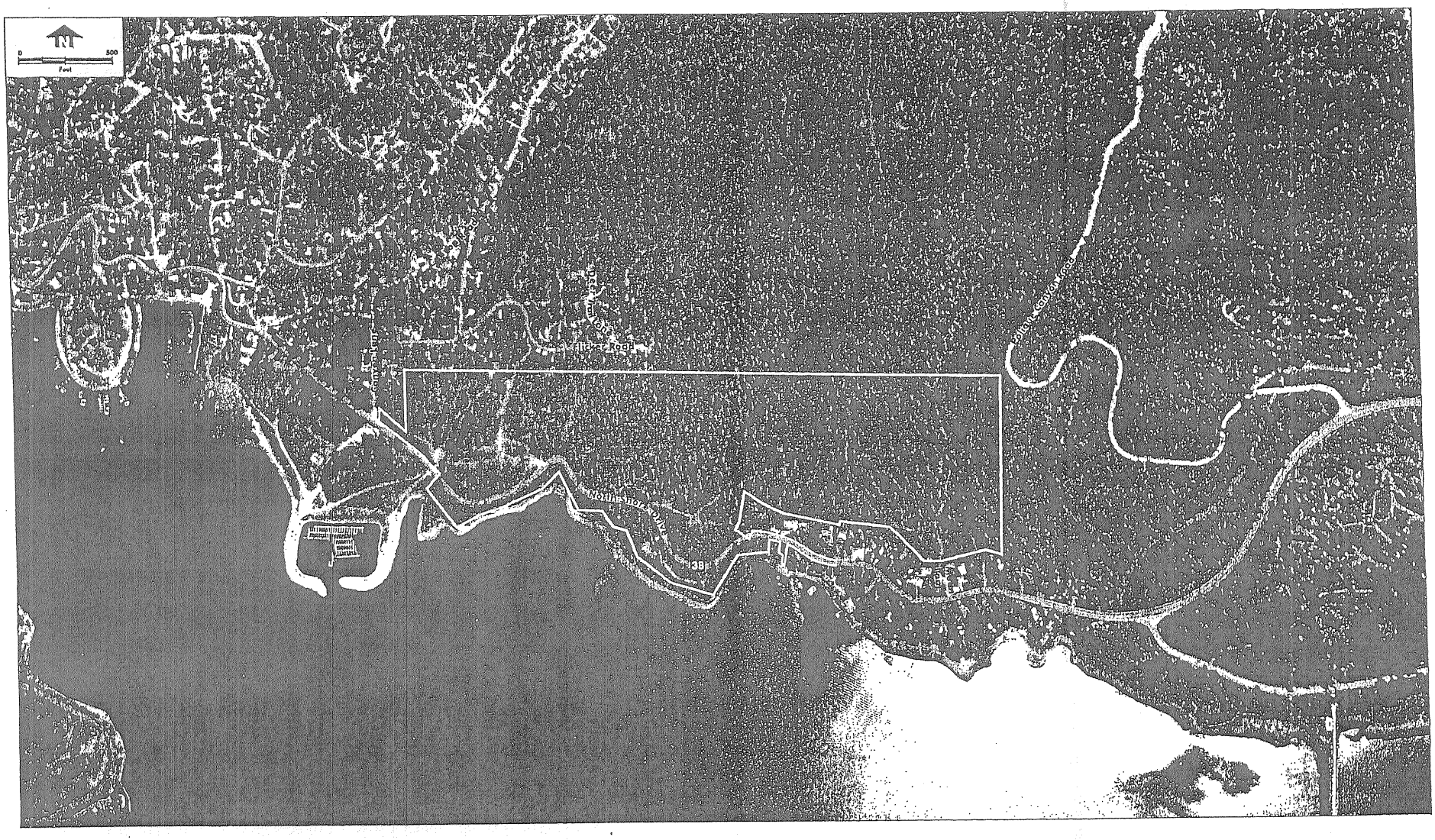
	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
I. **AESTHETICS** — Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☒	☐	☐	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☒	☐	☐	☐

SUBSTANTIATION (check __ if project is located within the viewshed of any Scenic Route listed in the General Plan):

a-c) The project site is currently undeveloped forested land, visible from State Highway 38, nearby residences, by boaters and other recreationists on or along Big Bear Lake, and by residents of the City of Big Bear Lake. The highway is federally-designated as a Scenic By-Way but has no State Scenic Highway designation. It is designated by the County as Scenic northerly from the East Valley to the Big Bear Dam (County General Plan). The existing scenic value of this property is considerable (refer to the aerial photo included as Figure 6 and the site photographs Figures 7 and 8) and will be substantially altered by the proposed development. An estimated 2,772 trees exist on-site; approximately 655, or 24 percent of the existing trees would be removed for roadway construction. Additionally tree removal would likely occur during individual lot development and construction of custom homes; the design of which is not a part of this project. Design of custom homes will be left up to the individual lot owner but will fall under the requirements of development for RS zoning. A visual resources assessment of the project's impacts, including tree removal and consideration of the future development of custom homes, as well as impacts to the scenic highway should be prepared and included in an EIR.

It is anticipated that a Timber Harvest Plan (THP) will be required by the California Division of Forestry (CDF) to comply with the State Forest Practice Act. A THP would substitute as a tree removal plan and permit in compliance with the County's Plant Protection and Management Ordinance. A revegetation plan prepared by a qualified professional (Registered Professional Forester, Licensed Arborist, or qualified botanist with restoration experience) would be required to ensure proper handling, planting, and maintenance for replacement of removed trees. The site restoration and revegetation plan should be specified in an EIR. The EIR may serve as CEQA compliance for the THP if adequate scoping that satisfies CDF is included. CDF may choose to perform its own CEQA compliance pursuant to the State Forest Practice Act procedures.

All trees to be removed, as shown on the plans and as directed by the Engineer, need to be removed and disposed of in accordance with the State and County provisions.



Aerial Photo

Tentative Tract 16136, "Moon Camp"
Fawnskin, County of San Bernardino

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Figure 6

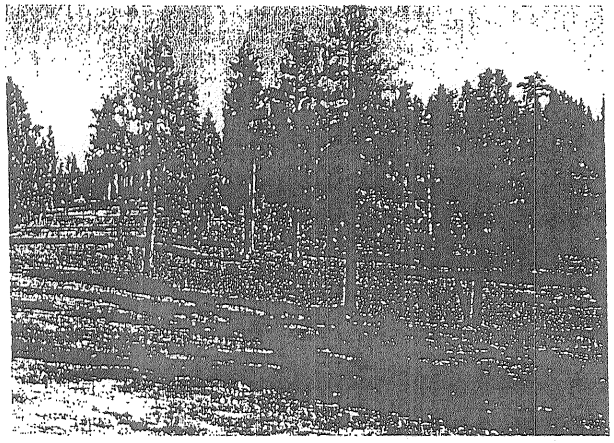

Photo 1 - Site topography and vegetation.

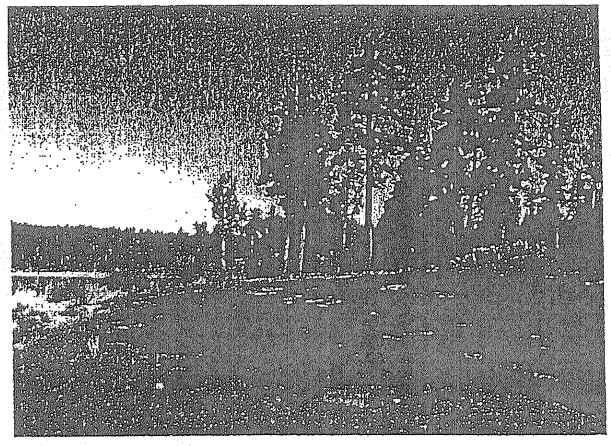

Photo 2 - Site topography and vegetation.

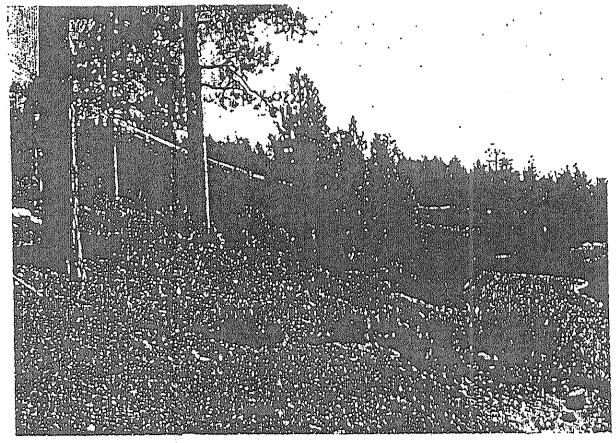

Photo 3 - Site Topography at the lake shore.

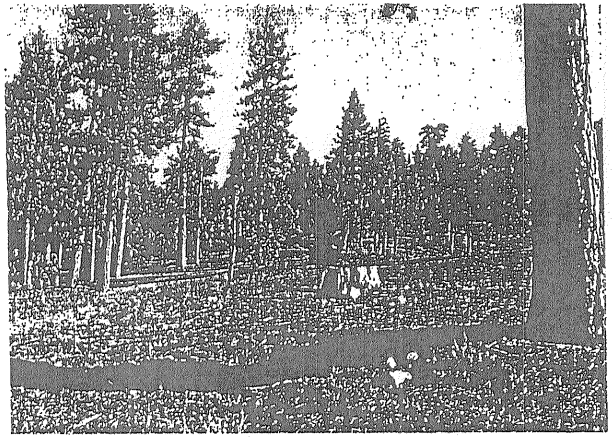

Photo 4 - Pebble plain western portion of site.

Photo 5 - Drainage course within pebble plain at westerly portion of site.

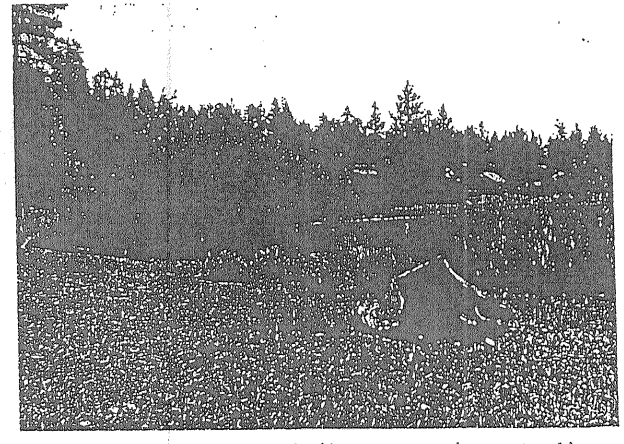

Photo 6 - South of Highway 38 looking east toward nearest residence.

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Site Photos

Tentative Tract 16136, "Moon Camp"
Fawnskin, County of San Bernardino

Figure 7

Photo 7 - Looking southerly across the lake to the city of Big Bear Lake.

Photo 8 - Southwest corner looking westerly near proposed boat dock.

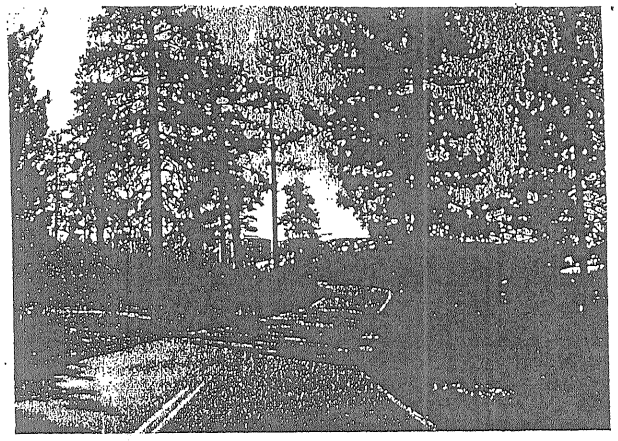

Photo 9 - Lake on right. Looking southeast from Canyon Road.

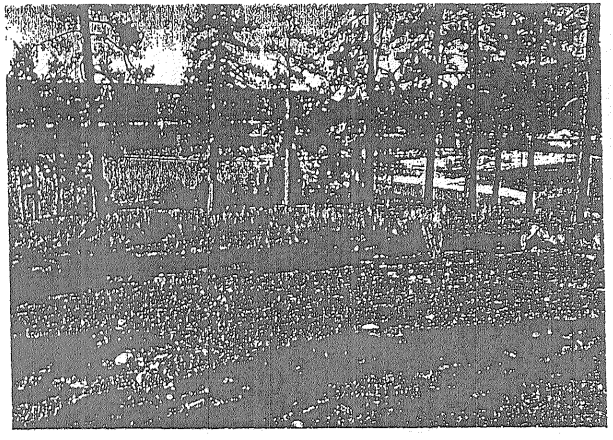

Photo 10 - Looking southerly from Highway 38 at proposed boat dock area.

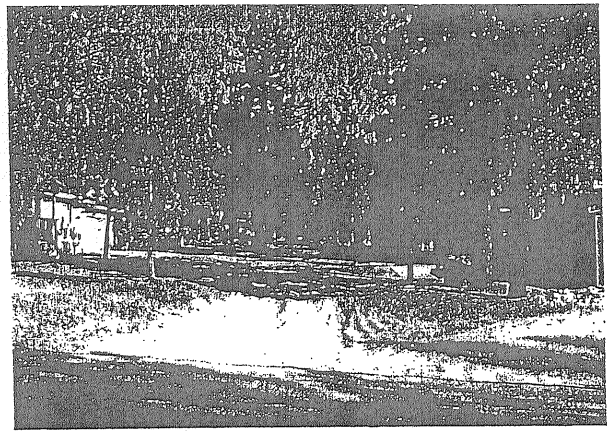

Photo 11 - Looking north on Moon Lane from Northshore Drive at existing residences east of project site.

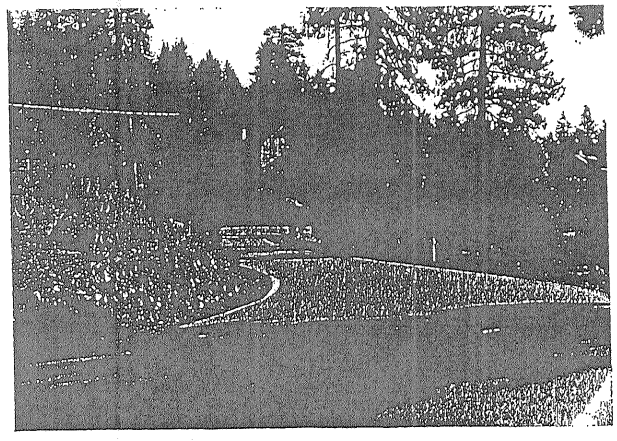

Photo 12 - Highway 38 looking easterly at existing houses east of project site.

Site Photos

Tentative Tract 16136, "Moon Camp"
Fawnskin, County of San Bernardino

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Figure 8

d) Sources of light that would be created by the project would be limited to the future homes to be constructed on-site. With the density of proposed development (RS-7200 = 6 lots/acre), a substantial change to the existing light environment would occur. Simulations of the nighttime impact of the project should be prepared and an evaluation of nighttime lighting should be included in the EIR.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
II. AGRICULTURE RESOURCES — In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒

SUBSTANTIATION (check __ if project is located in the Important Farmlands Overlay):

a-c) The project site is not known to contain soils that have been designated as prime or unique agricultural soils and agricultural activities have not historically occurred at the project site. The project would not adversely impact prime or locally important agriculture as none occur within the project area. The entire site is zoned residential and is not under a Williamson Act contract. No further discussion of agricultural resources is required in an EIR.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
III. AIR QUALITY — Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☒	☐	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☒	☐	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

SUBSTANTIATION (discuss conformity with the South Coast Air Quality Management Plan, if applicable):

The project site is located in the South Coast Air Basin (SCAB). The South Coast Air Quality Management District (SCAQMD) has jurisdiction over air quality issues and regulations within the SCAB. To assist local agencies to determine if a project's emissions could pose a significant threat to air quality, the SCAQMD has published its CEQA Air Quality Handbook (CEQA Handbook).

a-c) The project's potential impacts to air quality involve both construction and operational emissions. Construction impacts will result from grading and road construction and operational impacts will result from the expected use of wood-burning stoves or fireplaces. Demolition of the existing State Highway will consist of ripping and removing the existing asphalt and minor regrading on approximately ½ acre. Grading will also occur for the new alignment of the highway and new roads approximately less than 1 acre. The 92 lots will also be graded and improved. These activities will generate PM_{10} emissions in the short-term. Emissions associated with vehicle trips will also increase as the lots are purchased and occupied. Although the design of the homes is not currently known, it is likely that each will include a minimum of one fireplace. The impact of additional emissions in the Big Bear Valley resulting from additional wood-burning fireplaces and stoves will need to be evaluated. Air quality impacts associated with the project will require evaluation in an EIR.

The Big Bear Valley has relatively good air quality, compared to most of southern California. In the past few decades noticeable deterioration of air quality has occurred, however, due to increased local development and population growth, traffic, construction activity and various site disturbances. It is apparent that although air pollution is emitted from various sources in the Big Bear Valley, some of the most evident degradation may be attributable to sources outside of the area. The valley is impacted by significant air pollution levels caused by the transport of pollutants from coastal air basins to the west, primarily ozone, and by primarily locally generated PM_{10}. Air inversions trap moisture, suspended dust, and a variety of chemical aerosols emitted by trucks and automobiles, furnaces, fireplaces and other sources which creates haze and smog. The SCAQMD has identified two areas of air quality degradation associated with ozone (O_3) and micron-sized particulate matter (PM_{10}) *(City of Big Bear Lake Final General Plan EIR, July 1999).* The project may therefore contribute to a cumulative net increase in pollutants; impacts need to be evaluated in an EIR.

Table 6-3 of the SCAQMD CEQA Handbook identifies grading of three acres per day as having a potential to exceed the SCAQMD threshold for construction related emissions. The entire area within the project boundaries is 62.43 acres; the lot grading, private road construction, and State Highway

realignment, may exceed the SCAQMD threshold. CEQA and the SCAQMD require that all potential impacts be mitigated to the greatest extent feasible.

d) Sensitive receptors include hospitals, nursing homes, schools, and parks. Within the project's vicinity is the Dana Point Park (marina) ½ mile to the west, Grout Bay Park ½ mile to the west, Serrano Campground ½ mile to the east, Big Bear Middle School 2 miles to the southeast (in City of Big Bear Lake), Big Bear High School 3.5 miles to the east (in Sugarloaf), Northshore Elementary School 2.5 miles to the east and Bear Valley Community Hospital 2.5 miles to the southeast. The project's emission-related impacts to these receptors should be evaluated in an EIR.

e) The proposed residential development would not result in the generation of objectionable odors because the project does not include commercial or industrial land uses. Emission from any motorized boats using the boat dock would be minimal and temporary.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES — Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☒	☐	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation				

Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

SUBSTANTIATION (check if project is located in the Biological Resources Overlay ✓ or contains habitat for any species listed in the California Natural Diversity Database ✓):

a) The property lies within a County Biological Resources Overlay District. The proposed project site is located within a Jeffery pine forest community and contains plant species that are commonly found in such forest communities. Species listed in the California Department of Fish & Game Natural Diversity Data Base are shown in Attachment A (Commercial Version and Government Version). Those found during a Baseline Biological Survey and Resources Assessment conducted in June of 2000 to exist in the project vicinity include thirteen plant species and one plant community with special status. Of these, Ash-gray indian paintbrush *(Castilleja cinerea)* and silver-haired ivesia *(Ivesia argyrocoma)* were observed and are associated with pebble plain habitat in the western portion of the project site. No special status wildlife species were observed on the project site, however the area is known to support the Bald eagle, California spotted owl, Southwestern willow flycatcher, flying squirrel, and the Southern rubber boa. Additional surveys are required to determine the absence/presence of these species, as well as all others listed in Attachment A, and to determine impacts and mitigation measures. The Migratory Bird Treaty Act will also need to be addressed in an EIR. Protocol surveys for the Bald eagle are to be conducted in the winter.

b-c) The project site supports a drainage in the eastern portion which is a blue line stream on the USGS maps. This drainage may be considered as waters of the U.S. and impacts may be considered signficant. A wetlands delineation is required to determine jurisdiction and the need for mitigation measures in an EIR. Impacts to riparian and wetland related habitat and associated wildlife need to be evaluated in an EIR. The Mountain yellow-legged frog *(rana muscosa)*, a federally proposed endangered species is known to exist in the vicinity and should be surveyed for while conducting the wetlands delineation at the appropriate time of the year.

d) The Bald eagle survey shall include discussion of the species' use of the project site for roosting, foraging, and/or perching. Impacts to Black bear or other species that may use the property for lake access should be evaluated in an EIR.

e) It is anticipated that a Timber Harvest Plan (THP) will be required by the California Division of Forestry (CDF) to comply with the State Forest Practice Act. A THP would substitute as a tree removal plan and permit in compliance with the County's Plant Protection and Management Ordinance. A revegetation plan prepared by a qualified professional (Registered Professional Forester, Licensed Arborist, or qualified botanist with restoration experience) would be required to ensure proper handling, planting, and maintenance for replacement of removed trees. The site restoration and revegetation plan should be specified in an EIR. The EIR may serve as CEQA compliance for the THP if adequate scoping that satisfies CDF is included. CDF may choose to perform its own CEQA compliance pursuant to the State Forest Practice Act procedures.

f) No habitat conservation plans exist in the project area; this project will therefore not pose any conflict with existing plans for biological resource conservation.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
V. CULTURAL RESOURCES — Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☒	☐	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☒	☐	☐	☐

SUBSTANTIATION (check if the project is located in the Cultural _ or Paleontologic _ Resources overlays or cite results of cultural resource review):

a-b) The project site is not within a Cultural or Paleontologic Resources Overlay District, however a Historical Resources Overview was conducted for this site by the Archaeological Information Center of the San Bernardino County Museum for the applicant on August 6, 2001. The potential for Prehistoric Archaeological Resources is High, moderate to high for Historic Archaeological Resources, and low for Historic Resources. A site-specific investigation and survey should be conducted and used for determing the significance of impacts in an EIR. The results of the Museum's record search will be made available to the consultant preparing the EIR.

A cultural resources investigation was performed for a 50-acre site considered for relocation of the Moonridge Zoo, one mile to the east of the Moon Camp project site in portions of sections 7, 8, 17, and 18, T2N, R1E. The investigation included research conducted by the San Bernardino County Museum of a 1.5-mile radius. It was determined that the study area was not completely surveyed during any prior project, but a single investigation bounded the southern boundary of the property (McCarthy 1997) for the proposed nature trail between the Discovery Center and the Serrano Campground, and the Northshore Recreation Area Survey (Kaiser 1978) addressed the southern third of that study area. No resources were identified within the partially surveyed project area. In addition to these surveys, three area specific surveys and eight general overviews have been completed in the area. Six prehistoric sites and five pending archaeological sites were reported for the area surrounding the 50-acre project site. No historic sites and no pending historic sites have been identified in the general area. However, one possible historic structure (PSBR-50H) was noted on the historic maps, but is outside the Moonridge Zoo project area boundaries. *(A Phase I Cultural Resources Investigation for the Proposed Moonridge Animal Park Relocation Project Area, 2000).*

The above referenced study found no listed prehistoric resources or any prehistoric resources during the field investigation, however the relative sensitivity for such resources was assessed as "High". The August 2001 review conducted by the County Museum resulted in one recorded site (P36-060758), a metate and scraper.

c) On August 27, 2001, the Section of Geological Sciences of the San Bernardino County Museum prepared a letter summarizing their literature review and records search for the subject property (see Attachment B). The older Pleistocence alluvial fans resent within the boundaries of the property are derived from the San Bernardino Mountains and may not have been deposited in a manner conducive to the preservation of signifiant fossil resources. These fan deposits therefore have undetermined potential to contain significant nonrenewable paleontologic resources and are assigned as "undetermined paleontologic sensitivity". The inventory review results indicate that no paleontolgoic localities are recorded within the property boundaries, however one locality is recorded approximately 5 miles east of the site. This locality yielded fossil remains of extinct sabre-toothed cat and giant ground sloth from the same older Quaternary fan deposits as found on the project site. Therefore, excavation associated with project construction has the potential to adversely impact significant nonrenewable paleontologic resources. The mitigation program recommended by the Museum, for inclusion in an EIR, to reduce the signficance of impacts, is included in the Attachment.

d) A cemetery has been reported to be located just west of the half-mile radius surrounding the 50-acre Moonridge Zoo site, which could place the cemetery site close to the proposed Tentative Tract 16136 property. This cemetery, Pending Site No. 27, is referenced in a local history pamphlet:

> "An Indian burial ground has been reported to be situated on the lower flats of Delamar mountain just west of Polique Canyon. This is probably of a late date; that is, before the discovery of Holcomb Valley, but since the neophytes were released from the Missions in 1833". *(A Phase I Cultural Resources Investigation for the Proposed Moonridge Animal Park Relocation Project Area, 2000).*

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
VI. GEOLOGY AND SOILS — Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☒	☐	☐	☐
ii) Strong seismic ground shaking?	☒	☐	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐
iv) Landslides?	☒	☐	☐	☐
b) Result in substantial soil erosion or the loss of topsoil?	☒	☐	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project,				

and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☒	☐	☐	☐
d) Be located on expansive soil, as defined in Table 18 1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☒	☐	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☒	☐	☐	☐

SUBSTANTIATION (check _ if project is located in the Geologic Hazards Overlay District):

Preliminary data contained in this section of the Initial Study was obtained from the Geologic Feasibility Report prepared by RGS Geosciences, dated May 3, 2001 (see Attachment C). This Geologic Feasibility Report generally evaluated the geologic conditions of the property relative to the proposed development and recommended mitigation measures for geologic hazards identified. This report has been reviewed and approved as a general feasibility evaluation by the County Geologist (County Review 980 , Wes Reeder, Dated June 11, 2001). Comments are on-file for review during preparation of an EIR.

a) The most significant geologic seismic hazard associated with the property is strong ground shaking associated with a major local or regional earthquake. The site is located in a seismically active area where earthquakes of magnitude 6.0 or greater have occurred within a few miles of the site (see Attachment C). Secondary seismic hazards induced during periods of strong ground motions caused by major seismic events include ground rupture, landsliding or lurching, liquefaction, soil settlement, and rockfall. Each of these is briefly discussed below.

Ground Rupture: Most likely to occur along pre-existing fault traces that have ruptured the ground surface in the past. Considering the lack of geomorphology indicative of active faulting expressed at the ground surface, and absence of identified faulting near the property, the potential for ground rupture from tectonic sources is considered very low.

Landsliding: No areas of compromise due to slope instability or debris flows were noted on-site or in the immediate vicinity. In general, the majority of the site is composed of relatively gentle hillsides with natural gradients of less than 20 or 30 percent. The potential for landsliding is considered low. Locally, natural hillside gradients approach 40 percent exposing competent bedrock materials with a thin mantle of topsoil. The bedrock material in these areas is generally not considered to be susceptible to gross failure or instability. Minor surficial debris flows, however, cannot be precluded within the topsoil material during periods of heavy prolonged rainfall or saturation by rapid snow melt concurrent with seismic activity and ground shaking.

Liquefaction: Based on the density and coarse grain size distribution of the underlying older fan deposits and bedrock, the potential for adverse conditions or impact to the proposed development associated with liquefaction hazard is considered low throughout most of the property. Conditions conducive to liquefaction may however be present within the lower elevations of the site near the shoreline of Big Bear Lake where alluvial sediment is present and shallow groundwater occurs.

Settlement: The potential for this hazard is greatest in loose, unconsolidated, younger alluvial soil. The older fan deposits and bedrock underlying the property are considered well compacted and consolidated in their current conditions; the potential for seismically induced settlement is therefore low.

Conditions relative to settlement during a seismic event in the southern portions of the site would need to be mitigated through provisions to preclude liquefaction potential.

Rockfall: There are no large rock outcrops located along hillsides on, or adjacent to the site, that could become dislodged during a seismic event and impact the proposed development.

Flooding: The failure of large water storage facilities during a seismic event can inundate properties located within lower lying areas. No current water storage facilities are known in proximity to the site and therefore the potential for seismically-induced flooding *(from ruptured storage tanks)* is considered nil.

It is recommended that a slope stability study and a soils investigation for the entire tract be prepared for evaluation in an EIR. A geotechnical evaluation of the liquefaction susceptibility should also be addressed in an EIR.

b) The project will result in the grading of portions of 92 lots, the realignment of Highway 38, and grading of two new streets. Amounts of material impacted by cut and fill activities may be substantial. This could increase the potential for soil erosion and the loss of topsoil. Grading may also expose new rock outcrops. A geotechnical investigation of the property should be conducted to address the soil conditions of the site relative to the proposed development.

c-e) Earth material underlying the site is expected to consist of younger alluvial soil within the drainage courses, with older fan deposits and crystalline bedrock exposed in the higher elevations. A geotechnical investigation of the property should be conducted to address the soil conditions of the site relative to the proposed development. The purpose of the geotechnical investigation is to evaluate the physical properties of the soil and provide recommendations for site grading and the design and construction of proposed improvements.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
VII. HAZARDS AND HAZARDOUS MATERIALS — Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result,				

would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☒	☐	☐	☐

SUBSTANTIATION:

a-c) The project is a residential subdivision that includes the development of a boat dock for use by the residents of the development project. The storage and use of boats and fuel would be typical of any residential land use. The boat dock will not be an improved marina or include the storage of any fuels on-site. No other hazardous materials would be stored on-site or transported through the property as a result of the subdivision. The project would not require additional analysis of hazardous materials in an EIR.

d) The project site is not identified by the County of San Bernardino as a hazardous waste site (Map "Identified Hazardous Waste Sites," December 1, 1994). The County Fire Department HazMat Division responded to a Project Notice for Tentative Tract No. 16136 that "No hazardous materials conditions apply to this project" (July 24, 2001).

e-f) The project is not located within an airport land use plan or within the flight path of the Big Bear Airport which is located 3.5 miles to the east. There are no nearby airstrips. The proposed residential development would not pose a safety hazard for any residents or other visitors to the site resulting from proximity of the Big Bear airport.

g) The project will have access from State Highway 38 which is the primary roadway serving all of the Big Bear Lake area. The project also includes the realignment of this highway. The realignment will occur as two phases with construction of the new alignment completed before the existing alignment is demolished in order to eliminate the potential for hampering emergency response activity or evacuation plans. The project will include the addition of one private one public interior roads accessible from State Highway 38. The traffic impact analysis conducted for the project recommends the following to assure smooth and satisfactory traffic operations and good visibility:

- a 150-foot left turn pocket on Highway 38 at each project access location
- a stop sign to control outbound traffic onto Highway 38

- restriction of parking and controlling roadway access along arterials
- limit landscaping and sign height to 36 inches and within 25 feet of project driveways

Emergency access is determined adequate because there are two ways of reaching any point within the site.

h) The area is not within a Wildlands Fire Hazard Overly. It is within Fire Safety Review Area 2 (FR-2) as designated by the County and therefore must comply with the Fire Safety Overlay conditions as adopted in County Ordinance No. 3341. An FR-2 area is one that is relatively flat and urbanized but is located near an FR-1 area where wildland fires and other natural hazards may affect the FR-2 area. The County has established development requirements for land uses in an FR-2 area to reduce the exposure and risk from nearby wildfires or structure fires. For example, the County will require the development and each phase to have five (5) points of vehicular access for fire and other emergency equipment, and for routes of escape for evacuations *(Correspondence dated July 26, 2001 from Doug Crawford, SB County Fire Department to RCK Properties, Inc.).* The project will result in the development of 92 homes in an area where wildlands are adjacent, thereby continuing a mix of residences with wildlands. Design and evaluation of a fuel modification zone with appropriate landscaping designations and other fire prevention measures for the project should be included in an EIR.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
VIII. HYDROLOGY AND WATER QUALITY — Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☒	☐	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☒	☐	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☒	☐	☐	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage				

systems or provide substantial additional sources of polluted runoff?	☒	☐	☐	☐
f) Otherwise substantially degrade water quality?	☒	☐	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☒	☐	☐	☐
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☒	☐	☐	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☒	☐	☐	☐
j) Inundation by seiche, tsunami, or mudflow?	☒	☐	☐	☐

SUBSTANTIATION:

a) Due to the site's topography and the on-site drainage courses, the project has the potential to increase runoff and pollutants to Big Bear Lake. Discharges to the Lake are regulated by the California Regional Water Quality Control Board, Santa Ana Region (RWQCB). The RWQCB will require that an evaluation of the project-induced runoff be performed and will require a National Pollutant Discharge Elimination System (NPDES) Permit as well as a General Permit for Storm Water Associated Construction Activities. A Notice of Intent must be submitted to the State Water Resources Control Board.

Big Bear Lake is impaired for sedimentation/siltation, nutrients, copper, mercury, metals, and noxious aquatic plants. The sampling and analysis plan for obtaining the permits must address each of these constituents. Impacts to the lake could be considered significant since Total Maximum Daily Loads (TMDLs) have not been established for this impaired water body and the project could increase runoff of sedimentation and nutrients. The RWQCB's ability to issue new permits before the TMDLs are established may be limited. An evaluation of hydrologic conditions and potential impacts associated with project runoff into the lake must be included in the EIR.

b) The residential development will be served domestic water by the City of Big Bear Lake which has no municipal wells located within the project area. The project does not include any on-site wells. The site's location adjacent to the Lake does not provide an opportunity for any groundwater aquifer used for municipal water supply to be impacted. Relatively minor changes in the absorption rate of the property would occur as a result of the project. The project's potential impacts to local domestic water supply, as provided by the City, are discussed in Section XVI).

c-d) The property has several on-site drainage courses, one is a blue line stream. The project could substantially alter the existing drainage patterns. The project may require a Section 404 permit from the U.S. Army Corps of Engineers, a Section 401 certification from the RWQCB, and a Section 1603 Agreement from the California Department of Fish & Game. Determination of jurisdiction and permit requirements will be made following the necessary biological surveys and reports and during preparation of an EIR.

e) The project includes additional improved drainages to capture on-site flows and direct the discharge to Big Bear Lake. As discussed above, this may be a potentially significant impact and will require permitting by the RWQCB.

f) The project's contribution to water quality degradation will be determined through the permitting process in order to obtain a NPDES permit for discharges to the lake.

g-i) The project site is within Zone A – Special Flood Hazard Areas Inundated By 100-Year Flood (No Base Year Flood Elevation Established). The FEMA designation is found on Panel 7295-F, Map Dated March 18, 1996, Community 06-0270 (*August 16, 2001 telephone data request of SB County Flood Control District, Water Resources Division – Data Base Search*). Flood protection measures will therefore be required of the project and should be evaluated in an EIR.

j) The project will result in the development of 92 homes on property that lies within a 100-year flood plain. Big Bear Lake could also be subject to seiches resulting from earthquakes below the bed of the lake. Seiches usually take place in the direction of the longest diameter of a lake, but are occasionally transverse. Water-related hazards could therefore occur persons or property from implementation of the project. Mitigation measures need to be designed and evaluated in an EIR.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
IX. LAND USE AND PLANNING — Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐	☐	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

SUBSTANTIATION:

a) The project lies within the community of Fawnskin. Fawnskin is primarily developed to the west of the project site, with scattered residences south and east of the site. Because the project and the entire community of Fawnskin is accessible via State Highway 38, there will be no physical division of the existing community.

b) The project includes a General Plan Amendment/Land Use District Change from BV/RL-40 Rural Living (40-acre minimum lot size) to BV/RS Single Residential. Proposed lot sizes range from 0.17 acres to 2.11 acres. Approval of the GPA will be required along with approval of the project. The proposed land use does not appear to conflict with surrounding land uses which are primarily residential. However, the density of the proposed residential units may constitute a potentially significant impact that needs to be evaluated in an EIR. Dwelling unit density will be evaluated during

the planning review process and addressed in an environmental evaluation. A slope-density analysis will be required to aid in the review process.

c) No habitat conservation or natural community conservation plans exist in the project area; this project will therefore not pose any conflict with existing plans for conservation.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
X. MINERAL RESOURCES — Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

SUBSTANTIATION (check ___ if project is located within the Mineral Resource Zone Overlay):

a-b) The site is not within an area designated by the State for locally important mineral resources and it does not lie within the County of San Bernardino's Mineral Resource Zone. The San Bernardino Mountains however are rich in mineral resources; known occurrences include gold, silver, lead, zinc, iron, manganese, and tungsten. Claims have been operated extensively but most have been non-productive for at least 15 years. Just north of the project site is Holcomb Valley where William F. Holcomb discovered placer gold in May 1860. The mapped gold placer area begins approximately 1.5 miles north of the project site's northeastern boundary and the nearest placer gold claim (Wayne Placers) is located in section 8, approximately one mile to the northeast. One-half mile to the northeast is a site (Polique Canyon) identified as metal prospect or nonmetallic deposit which has not been operated. All other mapped claims, mines, and quarries are further to the north of the project site (*Geology of the San Bernardino Mountains North of Big Bear Lake, California, pp 51 – 67*). No impacts to mineral resources will occur as a result of the project's implementation.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
XI. NOISE — Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☒	☐	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

SUBSTANTIATION (check if the project is located in the Noise Hazard Overlay District _____ or is subject to severe noise levels according to the General Plan Noise Element __):

a) The existing acoustical environment in the immediate area of the site is typical of forested residential neighborhoods, particularly in the area east of Big Bear Lake. The site has been vacant and only previously used for access to the lake and most likely day use for hiking and picnicking.

Future homeowners on the site may be impacted by noise from SR-38. Likewise, existing residents may be adversely affected by construction noise. Mitigation may be necessary to maintain an exterior noise level of 65 CNEL and an interior noise level of 45 CNEL, as required by County standards and policies. A site specific noise analysis will be required to determine actual mitigation for this site. Results of the analysis will be included in an EIR.

b) The relocation of Highway 38 is proposed from the east to west, through the project site. Noise from construction of the highway could expose the existing development to temporary, yet severe noise levels without proper measures to mitigate the exposure.

Federal Highway Administration has adopted noise abatement criteria for highway construction projects published in *Procedures for Abatement of Highway Traffic Construction Noise* (23 CFR Part 772). These criteria basically establish an exterior noise abatement objective of 67 dBA and an interior objective of 52 dBA for specified land uses, including residences. These criteria apply to private yard areas. A site-specific noise analysis will be required to determine actual mitigation for this site. Results of the analysis will be included in the EIR.

c) The residential development will not result in a permanent increase in ambient noise levels greater than the surrounding residential areas, but will be greater than the ambient noise levels currently on the site. No analysis of the change in ambient noise levels would be required as this is expected to be a less than significant impact.

d) Temporary noise increases will result from all on-site construction activities (refer to a-c above). Lot grading and housing construction will result in temporary noise level increases. These are not expected to be significant since the lots will be sold individually and housing construction will not occur simultaneously. These temporary impacts however should be included in the noise analysis.

e-f) As noted in Section VII, the site is not within proximity to an airport or air strip. No impact will occur from aviation noise.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
XII. POPULATION AND HOUSING — Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☒	☐	☐	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

SUBSTANTIATION:

a) The Big Bear Lake area is a destination resort area and many of the residences are second homes. The City of Big Bear Lake estimates that about 68 percent of the City's housing units are second homes and as many of 50,000 people visit on peak holiday weekends. The City, for planning purposes, estimates an average of 2.44 persons per unit for all housing units, which is less than the State's average of 2.8 and accounts for the second homes and presently older population. Using this average, the proposed project will generate an additional population of 225 (92 homes x 2.44 persons/household).

The Fawnskin Chamber of Commerce estimates the maximum number of residents to be 600; the County estimates the population to be 380. Sixty-eight percent of 600 total residents would equal 408 permanent residents and therefore these population estimates are fairly accurate in light of the estimates of the region. The subject project would therefore increase the permanent population by 59% (225/380) and the total population by 38% (225/600). This is considered a significant increase in the community's population and will require analysis in an EIR.

b-c) The project is a 95-lot residential development on currently vacant land. There will be no displacement of existing housing or people.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
XIII. PUBLIC SERVICES —				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				

Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☒	☐
Parks?	☐	☐	☒	☐
Other public facilities?	☐	☐	☒	☐

SUBSTANTIATION:

Fire Protection – The addition of 92 homes to the Fawnskin community will not impact the services of the County Fire Department. The project area is served by County Fire Station No. 49, located in Fawnskin on Rim of the World Drive. The station is manned full-time and would be able to handle responses to the proposed project with current staffing and equipment. Mutual aid agreements exist with the City of Big Bear Lake and Big Bear City *(telephone conversation Captain Tellez, August 16, 2001)*. No further analysis of fire protection services is required outside of that indicated in Section VII of this Initial Study.

Police protection – The community of Fawnskin's police protection service is provided by the County of San Bernardino Sheriff's Department. The responsible sub-station is located at 477 Summit Boulevard in the City of Big Bear Lake. The Sheriff's Department maintains a patrol unit, an investigation unit, a Search & Rescue unit, and a jail/booking facility at the station. Service is also provided to the community of Big Bear and City of Big Bear Lake. The mountain communities in the area have volunteer support of law enforcement through an active Search and Rescue team, Citizen's Patrol, and Neighborhood Watch programs *(telephone conversation with Sheriff's station staff and City of Big Bear Lake Final General Plan EIR)*. The project would not result in significant impacts to the ability of the Sheriff's Department to serve the area; no further analysis is required.

Schools - The project lies within the Big Bear Unified School District. Students from the Fawnskin area attend Northshore Elementary School, Big Bear Middle School, and Big Bear High School. All schools are operating below capacity and no new school construction is currently planned. Because of existing capacity and the probability that many of the proposed homes will be second homes, the proposed project would not have a significant impact on schools in the District *(telephone conversastion with District staff, August 16, 2001)*.

Parks - Refer to Section XIV below.

Other Public facilities – Two county library branches are located near the community of Fawnskin – Big Bear and Lake Arrowhead. Both facilities are currently operational and would not be significantly impacted by the addition of 92 homes, many of which may be occupied as second homes.

Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact

XIV. RECREATION —

a) Would the project increase the use of existing neighborhood and regional parks or other recreational

facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☒	☐	☐	☐

SUBSTANTIATION:

a) The project is located in the Big Bear Lake area, which is a recreational resort area with several communities and one incorporated city. The community of Fawnskin, located on the north shore of the lake supports visitors with the provision of lodging, restaurants, boat docks, campgrounds, and picnic areas. The proposed project will include a boat dock for use by residents of the "Moon Camp Project". With review by the Big Bear Municipal Water District, the lake front property owners may also construct their own docks. Most properties on the lake at the present have 2-3 boat slips. No deterioration of existing recreational facilities such as neighborhood or regional parks would result from the project; many residents may not be permanent. Use of the lake will be the primary recreational activity associated with the project; this activity is regulated by the Big Bear Municipal Water District, as discussed below. No further analysis of impacts to local or regional parks is required.

b) The Big Bear Municipal Water District has approval authority for docks and recreational use of Big Bear Lake. The District is primarily responsible for the surface of the lake and therefore evaluates the needs for access to the lake via docks and marinas. Docks must be constructed in accordance with District standards and inspections. The lake capacity is currently determined to be 1,000 boats and the current average daily use is 250, with heavier use during holidays. Current lake statistics show that it is unlikely that in the forseeable future, the District will need to consider any action to restrict the number of boats on Big Bear Lake. There are three original "marina permits" that will allow docks to be built on the lake. Additionally, lake front property owners can build their own dock. An application for the proposed project's dock (as well as future docks for individual lake front lots) must be submitted to the District for review and approval. The existing "marina permit" for Moon Camp (boat landing no longer in use) may be able to be applied to this project. (*Correspondence dated July 31, 2001 from Sheila Hamilton, GM, Big Bear MWD*) A discussion of the Big Bear MWD permit requirements and potential impacts associated with use of the proposed project boat dock should be included in the EIR under Water Quality.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
XV. TRANSPORTATION/TRAFFIC — Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☒	☐	☐	☐
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☒	☐
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Result in inadequate parking capacity?	☐	☐	☐	☒
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☒	☐

SUBSTANTIATION:

The following discussion for traffic is derived from the report entitled "Fawnskin 93 Dwellings Traffic Analysis", prepared by Kunzman Associates for Tentative Tract 16136, dated May 15, 2001.

a) The project would result in approximately 890 new trips per day if all homes are occupied full-time. All intersections in the vicinity of the site currently operate at a Level of Service (LOS) E or better; the County Standard is LOS C. The intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. Attachment D contains a Traffic Analysis report prepared for the project by Kunzman & Associates As discussed below, a Traffic Impact Analysis will be required for the project. The County has also determined that a traffic study will be required to address project traffic impacts at the intersections of North Shore Drive at Stanfield Cutoff and Big Bear Boulevard at Stanfield Cutoff.

b) The project will generate approximately 81 new peak hour trips. In San Bernardino County, a project requires a Traffic Impact Analysis prepared to Congestion Management Plan guidelines if it will generate more than 250 new peak hour trips. Although this project does not generate 250 new peak hour trips, the County is requesting that the CMP TIA requirements be met. The analysis may use engineering judgment rather than the East Valley Traffic Model for peak hour traffic distribution. A TIA must be accepted by the San Bernardino Associated Governments prior to certification of an EIR. Results of the TIA should be included in the EIR

c) No changes to air traffic patterns would result from the proposed residential subdivision project.

d) The relocation of State Highway 38 will be designed in cooperation with Caltrans to meet their standards for traffic flow and safety. The project's internal roads include cul-de-sacs, but no sharp turns or apparent safety hazards.

e) Emergency access will be adequate as discussed in Section VII.

f) There is no public parking associated with the development project. Each individual lot will have typical residential parking provisions.

g) The residential development will have no impact on existing public transportation systems or programs. No bike lanes exist in the vicinity on State Highway 38.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
XVI. UTILITIES AND SERVICE SYSTEMS — Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☒	☐	☐	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☒	☐	☐	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☒	☐	☐	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☒	☐	☐	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☒	☐	☐	☐
f) Be served by a landfill(s) with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

SUBSTANTIATION:

a) The project site lies within the sewering jurisdiction of CSA 53 Improvement Zone B. Wastewater treatment is provided by the Big Bear Area Regional Wastewater authority (BBARWA) which holds a permit for operation of the plant with the RWQCB. The project applicant has completed a Sewer Feasibility Study *(prepared by So & Associates Engineers Inc., July 26, 2001)* which will be required to procure a verification letter from the County stating whether or not sewer connection and service can be made available to the project. The size of lots would not allow that all lots can be developed with septic systems. Therefore, the only alternative to connecting to the public sewer is an on-site wastewater treatment plant which would require permitting through the County Environmental Health Services and the California Regional Water Quality Control Board.

b) The need for additional water treatment facilities or expanded facilities will require evaluation by the impacted water provider. The project site may be served by the City of Big Bear Lake, Department of Water and Power, however annexation of the site may be required (see Item c. below). Therefore the

environmental effects of providing water supply to the project and the impact on water supply infrastructure is presently unknown and will require evaluation in an EIR.

Wastewater treatment is provided in the vicinity of the project by the Big Bear Area Regional Wastewater authority (BBARWA). Sewage collected in the Fawnskin area by the sewering agency (see below) is treated by the BBARWA at their plant located in Big Bear City. In 1998, the plant was operating at about 60 percent of treatment capacity and new connections averaged 125 per year. All flows are residential and commercial and sludge is transported off-site for disposal *(City of Big Bear Lake Final General Plan EIR)*. BBARWA has a 10-inch sewer force main that is located within the southern right-of-way of North Shore Drive and would therefore be impacted by development of the southerly lots and Lot "A". BBWRA has indicated the force main will need to be relocated to stay within the roadway shoulder and that additional air vaults and release valves should be installed to control odors within the tract.

The project applicant will be required to submit its Sewer Feasibility Study to the County; County Service Area (CSA) 53 contributes flows and related connection fees to the regional wastewater treatment plant and will therefore determine available capacity for both the sewage collection and treatment system. The Sewer Feasibility Study estimates average flows at 19,780 gallons per day; with a peaking factor of 4, flows would be 79,120 gallons per day, or approximately 2 percent of existing treatment plant capacity. Currently adequate capacity is available and no further analysis will be required in an EIR; permitting conditions will be required as described below.

c) The project will increase stormwater runoff on the project site; a series of storm drains are proposed for the site. Impacts to Big Bear Lake are potentially significant. The project is not in an area with a master storm drain system. Drainage plans for the project will require review by the County Department of Public Works. Impacts to Highway 38 will require review by Caltrans. Storm drain plans should be provided in detail for evaluation of impacts in an EIR, particularly related to water quality impacts.

d) The City of Big Bear Lake, Department of Water and Power provided a letter to the Applicant dated April 19, 2001 indicating the City will provide water service following the preparation of the Water Feasibility Study to determine the size and type of water facilities required and the meeting of financial arrangements. The project site may not presently be within the City's water service area and therefore other conditions may be required for an "out of service area" connection. Service extensions outside the existing service area (formerly Southern California Water Company – Big Bear District) require review and approval by the San Bernardino Local Agency Formation Commission (LAFCO) *(Correspondence dated November 9, 1994 from James Roddy, Executive Officer LAFCO to Michael Perry, General Manager City of Big Bear Lake, DWP)*.

CEQA Guidelines Section 15083.5 require that consultation occur between a city or county and the affected water agencies during the environmental review of certain projects. The amendment to a land use element of a general plan or specific plan which would result in a net increase in the population or building density; or the adoption of a specific plan are identified projects required to follow these guidelines. The proposed project requires a General Plan Amendment, therefore the Lead Agency must identify the public water system that will serve the project and request that the affected water agency assess whether the projected water demand associated with the project is covered by the water agency's master water management plan.

A public water system that is notified by a Lead Agency must prepare an assessment indicating whether its total projected water supplies will meet the projected water demand of the proposed project, in addition to the other planned future uses of water. The governing body of the public water system must approve the assessment, at one of its official meetings, no later than 30 days after the

date on which the request for the assessment was received. If the public water system fails to submit the assessment to the Lead Agency in a timely manner, the Lead Agency may assume that the water system has no information to submit. If, as a result of the assessment, the public water system concludes that its supplies are insufficient, it must submit to the Lead Agency its plans for additional water supplies.

The Lead Agency must include the water assessment in the EIR, but the length of such discussion may not exceed ten pages unless the Lead Agency determines that additional information is necessary. Also, at the time it makes a decision on the project, the Lead Agency must determine whether the projected water supplies will be sufficient to satisfy the demands of the proposed project, in addition to existing and planned future uses. If the Lead Agency determines that water supplies will not be sufficient, it must include that determination in its findings. (CEQA Deskbook, 1999 (Second Edition), Chapter 5, pages105-106)

Water supply within the Big Bear Valley, like many areas in California, is presently limited. The project's ability to have an assured supply of water, in accordance with the County General Plan, will require evaluation in an EIR.

e) Refer to Discussion Item a) above.

f) The project will generate an estimated 0.75 tons per day or 287 tons/year of solid waste (based on full-time occupancy of 92 homes at 2.44 persons/household generating solid waste at 7 lbs./person/day). Solid waste collection in the Fawnskin area is provided by Big Bear Lake Disposal, Inc.. Big Bear Lake Disposal currently uses the Big Bear Sanitary Landfill fo disposal of solid waste collected in the Big Bear Valley area. The County of San Bernardino owns and operates the Big Bear Sanitary Landfill. The landfill is located in an unincorporated area north of Baldwin Lake off of Highway 18 and is currently nearing capacity. The County is designing a transfer facility at the landfill site which should become operational in 2002. Waste will then be hauled from the transfer station to the Barstow landfill; Barstow is currently being re-permitted to allow this solid waste to be disposed of at Barstow. Solid waste collection and disposal will therefore not be significantly impacted by development of the project.

g) Expansion and development of the County's landfill system is permitted by the California Integrated Waste Management Board. The project's compliance with the previously discussed agencies' policies and standards will not result in any additional significant impacts.

	Potentially Significant Impact	Less than Significant with Mitigation Incorp.	Less than Significant Impact	No Impact
XVII. MANDATORY FINDINGS OF SIGNIFICANCE—				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable				

when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

SUBSTANTIATION:

a) The property lies within a County Biological Resources Overlay District. The proposed project site is located within a Jeffery pine forest community and contains plant species that are commonly found in such forest communities. Species listed in the California Department of Fish & Game Natural Diversity Data Base are shown in Attachment A. Those found during a Baseline Biological Survey and Resources Assessment conducted in June of 2000 to exist in the project vicinity include thirteen plant species and one plant community with special status. Of these, Ash-gray indian paintbrush *(Castilleja cinerea)* and silver-haired ivesia *(Ivesia argyrocoma)* were observed and are associated with pebble plain habitat in the western portion of the project site. No special status wildlife species were observed on the project site, however the area is known to support the Bald eagle, California spotted owl, Southwestern willow flycatcher, flying squirrel, and the Southern rubber boa. Additional surveys are required to determine the absence/presence of these species, as well as all others listed in Attachment A, and to determine impacts and mitigation measures. The Migratory Bird Treaty Act will also need to be addressed in an EIR. Protocol surveys for the Bald eagle are to be conducted in the winter.

The project site supports a drainage in the eastern portion which is a blue line stream on the USGS maps. This drainage may be considered as waters of the U.S. and impacts may be considered signficant. A wetlands delineation is required to determine jurisdiction and the need for mitigation measures in an EIR. Impacts to riparian and wetland related habitat and associated wildlife need to be evaluated in an EIR. The Mountain yellow-legged frog *(rana muscosa)*, a federally proposed endangered species is known to exist in the vicinity and should be surveyed for while conducting the wetlands delineation at the appropriate time of the year.

The Bald eagle survey shall include discussion of the species' use of the project site for roosting, foraging, and/or perching. Impacts to Black bear or other species that may use the property for lake access should be evaluated in an EIR.

It is anticipated that a Timber Harvest Plan (THP) will be required by the California Division of Forestry (CDF) to comply with the State Forest Practice Act. A THP would substitute as a tree removal plan and permit in compliance with the County's Plant Protection and Management Ordinance. A revegetation plan prepared by a qualified professional (Registered Professional Forester, Licensed Arborist, or qualified botanist with restoration experience) would be required to ensure proper handling, planting, and maintenance for replacement of removed trees. The site restoration and revegetation plan should be specified in an EIR. The EIR may serve as CEQA compliance for the THP if adequate scoping that satisfies CDF is included. CDF may choose to perform its own CEQA compliance pursuant to the State Forest Practice Act procedures.

No habitat conservation plans exist in the project area; this project will therefore not pose any conflict with existing plans for biological resource conservation.

b) The proposed project in conjunction with other proposed or reasonably foreseeable projects may result in significant cumulative effects to traffic, air quality, stormwater runoff and other resources. An evaluation of cumulative impacts will be included in the EIR.

c) It is unknown at this time whether the proposed project will have substantially adverse effects on human beings. This will be evaluated in the EIR.

REFERENCES (List author or agency, date, title)

1998 CEQA Guidelines

A Phase I Cultural Resources Investigation for the Proposed Moonridge Animal Park Relocation Project Area in Fawnskin, San Bernardino County, California, McKenna et al., June 24, 2000

Baseline Biological Survey of the Moonridge Zoo Big Bear Valley, Potential Relocation Site, Big Bear Valley, San Bernardino County, California, Biological Resource Specialists, August 2000

Biological Assessment of the Moon Camp Property Site in Fawnskin California, Michael Brandman Associates, August 10, 2000

City of Big Bear Lake Final General Plan EIR, July 1999

County of San Bernardino Development Code, adopted 1989, revised 2001

County of San Bernardino General Plan, adopted 1989, revised 2001

County of San Bernardino Hazard Overlay Maps.

County of San Bernardino Identified Hazardous Materials Waste Sites List, April 1998

Environmental Impact Report, San Bernardino County General Plan, 1989

Fawnskin 93 Dwelling Traffic Analysis, Kunzman Associates, May 15, 2001

Geologic Feasibility Report, Moon Camp Tentative Map/Lot Study, RGS Geosciences, May 3, 2001

Geology of the San Bernardino Mountains North of Big Bear Lake, California, California Division of Mines, Special Report 65, 1960.

15.2 Initial Study/Notice of Preparation Public Review Comments

Moon Camp Project – JN 10-101901

Public Scoping Meeting – March 2, 2002

Meeting Notes – Public Comments

Barbara Pitts –
Ms. Pitts focused her concerns on air quality issues. She has provided a two-page letter outlining her concerns. She states that the EIR should address the following issues and/or consider impacts to:

- Air - Direct air emissions (primary pollutants) –
  - Stationary sources – Oxides of nitrogen, organics, carbon monoxide, SO_2, particulate emissions (wood burning fire places and stoves)
  - Mobile sources - Ms. Blake recommends not to use federal procedures because there would be many "cold starts." Also there would be idling from increased traffic volumes. Should include discussion of toxic air contaminates (TAC) (i.e., benzene, formaldehyde). Should discuss impacts from diesel emissions (TAC).
- Public Health/Air Quality – Impacts to public health as a result of particulate emissions.
- Air - Utilize up-to-date emission inventories. Inventories should be current (i.e. 2000 or 2001).
- Air – Impacts to public health, including sensitive receptors (elementary schools, residences, etc.).
- Air – Impacts created by secondary pollutants (formed by reactions in the air). Should conduct photochemical modeling to assess increases in Ozone, particulates, NO_2, Nitric acids, etc. Impacts from these pollutants should be discussed as to both the Valley and downwind areas.
- Air – Cumulative air quality impacts; should evaluate pollutants generated in project area and the pollutants transported into area.
- Air - Impacts to visibility.
- Air- Air qualities models should not be solely relied upon, baseline studies should be utilized too.

Bob Drake –
Mr. Drake stated that the EIR should address the following issues and/or consider impacts to:

- Land Use – Possibility of future subdivisions on the project site.
- Recreation - Public access corridors, including access to lake and surrounding forest area.
- Aesthetics/Biology – Tree removal, including trees at building sites on future lots, not solely from Highway 38 realignment.
- Traffic/Utilities - Cumulative effects (i.e. traffic, wastewater) of other developments. Mr. Drake refers to the Cluster Pines development and potential development of area north of Flicker Road.

Nancy Jenson –
Ms. Jenson stated that the EIR should address the following issues and/or consider impacts to:

- Hydrology - Potential for water shortages.
- Utilities - Wastewater treatment capacities.
- Hydrology - Potential for water pollution as a result of increased amounts of wastewater and run-off.

Gary Stuby –
Mr. Stuby stated that the EIR should address the following issues and/or consider impacts to:

- Hydrology - Potential for impacts to the water quality of Big Bear Lake.
- Hydrology - Impacts to total maximum daily load (TMDL) of lake. Lake is listed as impaired body of water due to run-off of nutrients, metals, etc. Should discuss effects of increased run-off into lake.
- Hydrology – Alternatives/mitigation should include limits on type of landscaping, possibly "zero-scape," maybe prohibit grass.

John Hawkins –
Mr. Hawkins stated that the EIR should address the following issues and/or consider impacts to:

- Utilities - Potential electricity shortages.
- Hydrology - Water quality of lake. Impacts as a result of run-off. Run-off affecting residences to the south of lots/residences.
- Noise - Noise levels from diesel trucks.
- Air - Odors from diesel trucks.
- Traffic - Increased truck traffic on North Shore Drive.

Marc Winters –
Mr. Winters stated that the EIR should address the following issues and/or consider impacts to:

- Aesthetics – Realignment of North Shore Drive would remove 735+ trees, this could impact the visual character of area.
- Aesthetics – Lakefront homes could diminish view of lake.
- Aesthetics - Mr. Winters states that if trees are removed, he would never see the re-planted trees in his lifetime.

Unknown Property Owner at 1092 Canyon Road
Gentleman stated that the EIR should address the following issues and/or consider impacts to:

- Aesthetics - Lakefront views could diminish with new homes south of North Shore Drive.
- Cumulative impacts of nearby developments to community.
- Traffic – Increased traffic volumes on North Shore Drive.

Dave Hoag –
Mr. Hoag stated that the EIR should address the following issues and/or consider impacts to:

- Biology – Biological surveys should be conducted on a year-around schedule; the four seasons have distinct biological characteristics (i.e. bald eagle numbers vary from season to season).

Robyn Yoliason –
Ms. Yoliason stated that the EIR should address the following issues and/or consider impacts to:

- Land Use – Potential impacts resulting from re-zoning, especially to property values.
- Recreation - Public access to lakeshore. Access could be limited due to a gated community.
- Biology - Cumulative impacts to biological resources, specifically to Bald Eagles, pebble plain habitat, and riparian habitat. Developments in the area are creating incremental losses to habitats and species. Available mitigation measures are not satisfactory.
- Biology - All bald eagle perch trees should be identified. Ms. Yoliason feels that not all of these trees have been identified. Future and current trees should be identified. She points out that it takes hundreds of years to create a perch tree. Eagle Point Estates built perch trees, but they were later cut down. The Castle Plan (?) Development had an easement set aside to be utilized by bald eagles, but the easement area was not adequately maintained. She stresses that even if there is mitigation measures, the measures might not adequately act to protect biological resources.
- Biology – Pebble plain habitat is unique to the Big Bear area. It supports at least one endangered plant species and numerous sensitive plant species. How will EIR mitigate for those losses? She states that the record for mitigation in Big Bear is poor.
- Utilities – Potential electricity shortage.

J.S. Smith –
Mr. Smith stated that the EIR should address the following issues and/or consider impacts to:

- Biology – Impacts to bald eagles.
- Biology – Impacts to bird-life, including osprey, coots (eagles eat the coots), migratory waterfowl, great blue herons.
- Recreation – Impacts to lake from increased watercraft and pollution.
- Traffic – Traffic at Stanfield Cut-off, at North Shore Drive and Big Bear Blvd.

John Wall –
Mr. Wall stated that the EIR should address the following issues and/or consider impacts to:

- Biology – Eagle surveys should be conducted year around.

Jim McGrew –
Mr. McGrew stated that the EIR should address the following issues and/or consider impacts to:

- Biology – Concerned about access to lake by deer.
- Hydrology – Water quality of lake. Potential for water shortages.

Kris Oskell - Property Owner at 39632 Flicker Road -
The EIR should address the following issues and/or consider impacts to:

- Public Safety – Safety on roadways, especially in village area, where kids cross streets.

Rob Shepard -
Mr. Shepard stated that the EIR should address the following issues and/or consider impacts to:

- Geology – Potential seismic impacts.

Jerry White -
Mr. White stated that the EIR should address the following issues and/or consider impacts to:

- Traffic – Potential traffic impacts, specifically truck traffic on North Shore Drive.
- Mr. White points to a letter that Jerry Lewis (Supervisor) asks, why doesn't the Forest Service purchase/annex the property.

Buffy Francis -
Ms. Francis stated that the EIR should address the following issues and/or consider impacts to:

- Traffic – Cumulative traffic affects, including traffic from zoo that is to be moved to the North Shore area.
- Services – Will be there adequate school facilities?
- Recreation – Public access to lake.

Dennis Larje -
Mr. Larje stated that the EIR should address the following issues and/or consider impacts to:

- Cumulative affects to South Shore area, increases in traffic on weekends, air quality, and noise levels on lakefront on south shore.
- Health and Safety – ability of Big Bear to provide medical attention. Impacts to hospital capacities.

Peter McDowell -
Mr. McDowell stated that the EIR should address the following issues and/or consider impacts to:

- Noise – Increased noise levels.
- Services – Increased criminal activity, police protection.
- Traffic – Potential for more traffic accidents.
- Recreation – Limits public access to lake. For example, fishing and walking.
- Aesthetics – Change in visual character.

Glenda Akins -
Ms. Akins stated that the EIR should address the following issues and/or consider impacts to:

- Traffic - Impacts to South Shore traffic, which is already "bad."
- Biology – Eagle perch trees, points to Eagle Point development.
- Aesthetics – Change in visual character.
- Aesthetics/Biology – Tree removal. Lot owners removing trees.

Don Edes – 38596 North Shore Drive
Mr. Edes is represents the North Shore on the Big Bear Area Regional Wastewater Agencies Board. Mr. Edes stated that the EIR should address the following issues and/or consider impacts to:

- Utilities – Impacts to wastewater systems/sewer capacities. Infiltration and Influence (INI) Study underway for last 2 years, but not complete. Request has been made for carbon filters in the Moon camp project, due to odors.
- Utilities - Tom Sutton (County- Public Works) and Steven Schindler (General Manager of Sewer Plant) say that the existing 8-inch mains would handle the sewer for the proposed property, but he is not sure about the cumulative wastewater requirements of the other potential developments.
- His agency has voted to start a new water recycling program.

Tom Murphy -
Mr. Murphy stated that the EIR should address the following issues and/or consider impacts to:

- Mitigation measures should affect Fawnskin and not Big Bear Valley.
- Zoning should not change. If the zoning does change, it would increase the value of the property, making it more financially more difficult for the Forest Service to purchase the property.

Sandy Stears -
Ms. Stears stated that the EIR should address the following issues and/or consider impacts to:

- Recreation – Lake activities.
- Aesthetics – Views of lake.
- Biology – Eagle perch trees are not limited to a few trees.
- Noise – Decrease in trees would increase noise levels.

Susan Crockett -
Ms. Crockett stated that the EIR should address the following issues and/or consider impacts to:

- Aesthetics – Impacts from wood burning fireplaces and stoves on views.
- Public Health/Air Quality – Impacts to public health from wood burning fireplaces and stoves.
- Services – Ambulance services. Fire protection services.
- Noise – Increases in noise levels.
- Traffic –
    - Peak weekend traffic (Holiday weekends).
    - Village traffic is a problem, since there is no stop sign.
    - Traffic from Bear to North Shore Drive.
    - Traffic at Stanfield cutoff (especially difficult on Sundays).

Michael Stoll
5 Madison
Newport Beach, CA 92660

RECEIVED
MAR 13 2002

March 7, 2002

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave. Third floor
San Bernardino, CA 92415-0182

Attention: Tracy Creason, Senior Associate Planner

RE: Environmental Impact Report (EIR)
For Moon Camp TT #16136

Gentlemen:

In 1972 our family purchased a second home in Fawnskin. It is my concern that the historic small town of Fawnskin be preserved and protected for generations to come.

The two proposed developments are of great concern to me. Moon camp and Cluster Pines. The development of these two areas will obstruct public lake access and views from the highway. The number and density of the units proposed will cause traffic problems and air pollution. The removal of trees will affect the eagle and plant habitat areas. There will be a tremendous overload on community resources such as water and sewer.

The proposed development would change the mountain character of the north shore. This project should not be approved. We need to preserve the area for future generations.

Sincerely,

Michael Stoll

Robin Butler
P.O. Box 309
1098 Canyon Road
Fawnskin, CA 92333
July 31, 2001

Mike Williams
San Bernardino County Land Use Services Department/Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

Re: PN: RCK Properties, File/Index: GPA/TT/M331-8N/01/APN:0304-091-12*

Dear Mr. Williams:

I have lived in Fawnskin for 12 years and owned property on Canyon Road for 8 years. I was not included in the County's mailing list for this proposal. Please add me to your mailing list for any project in the Fawnskin area under the County's jurisdiction. Additionally, I formally request notification of anything having to do with this project in particular. Also, I would like to go on the record requesting that any meetings or public hearings having to do with this proposal be held in the Big Bear area rather than in San Bernardino in order to ensure adequate representation by those with local concerns.

Please record the following comments in regards to the proposal to develop the Moon Camp area of Fawnskin:

1) Due to numerous problems with the Project Notice and the notification process, it is clear that the County is not truly interested in obtaining the public's comments on this project. There are so many mistakes and omissions in the Project Notice and the tiny barely-readable map, that it is impossible for concerned citizens to adequately understand the nuances of the project and provide valid comment. The Project Notice should be redone with an extended response date for several reasons:

a) The Project Notice did not adequately describe several critical aspects of the project, including the fact that Highway 18 would be re-aligned much closer to existing houses and that extensive cut and fill slopes would be used and the fact that 100 boat slips and associated dredging would be involved.

b) The notification list used for the mailing was completely erroneous and inadequate. All adjoining land-owners, including the Forest Service, were not notified. Additionally, because the project would impact all residents of Fawnskin by increasing the population by a third and completely altering traffic patterns, I would suggest that all residents of Fawnskin be notified. At the very least, all property-owners on Canyon Road, Mesquite Road, Flicker Road, and Fawnskin Drive should be notified because of the huge effect on the immediate neighborhood. Many of the names and addresses on the mailing list were incorrect and did not reach intended

recipients. No mail is delivered to street addresses in Fawnskin—only Post Office Box addresses work.

c) I may be mistaken but I do not believe that Big Bear City Community Services District is the correct supplier of services. I live just ¼ mile up the road and my services are supplied by the County and by the Department of Water and Power.

d) The project description incorrectly places the development proposal just east of "Oriole Drive". The street is actually "Canyon Road".

2) I am opposed to the drastic development for a number of reasons:

a) The stretch of shoreline included in the development proposal is one of the few remaining places where the public can access the lakeshore for fishing, picnicking, etc. This land should be placed in public ownership for undeveloped recreation access. There is an adequate number of houses in the Big Bear area but the amount of shoreline recreation area is limited and cannot be expanded due to existing development. Building a number of houses with 5 and 10 foot sideyards along the entire shoreline and adding boat slips along that entire stretch will effectively eliminate shoreline access from all of the neighbors who live nearby. While it would still be legal for us to walk the high water line, there would be no way to get there through the development to enjoy the lake.

b) The Biological Report is wholly inadequate and must be redone by a biologist and botanist familiar with Big Bear's species and habitats. The Moon Camp parcel supports a number of rare plants and animals, including two species protected under the Endangered Species Act (bald eagle and ashy-grey paintbrush). Suitable habitat for endangered willow flycatchers exists on site but protocol surveys were not done for this species. The shoreline willow stands may also support the endangered willow flycatcher that has been recently found nesting in the Big Bear area not far from Moon Camp. The cumulative loss of shoreline habitat around Big Bear needs to be addressed and considered. It does not appear that it would be possible to mitigate for loss of shoreline habitat on Big Bear Lake.

Several trees on the Moon Camp property are used on a daily basis by a pair of adult bald eagles during their winter stays between November and April every year. I have studied Big Bear's eagles for 12 years and, in addition, have observed this particular pair and their use of Moon Camp as I go to and from work daily during the winter. To not even mention this site as known bald eagle habitat is a gross oversight (that could have been corrected by talking to any resident of Fawnskin!) and only reflects the inadequacy of the biological report. The area proposed for the marina, and the entire shoreline, is important foraging habitat for the bald eagle. If the parcel is developed as proposed, eagle use would likely be eliminated.

California spotted owl, San Bernardino flying squirrel, and many other rare wildlife species are known from the area. Suitable habitat exists for these species on the parcel and impacts to the species and habitats need to be evaluated.

Moon Camp also supports a number of rare non-listed plants associated with pebble plain plant communities endemic to the San Bernardino Mountains. This habitat type is being lost on a daily basis throughout the Big Bear area. Because it occurs nowhere else in the world, it is critical to maintain it here. This occurrence of ashy-grey paintbrush is substantial and its loss, combined with ongoing impacts to other occurrences, could be critical for this species. Development of the land and relocation of the highway would result in complete obliteration of this occurrence of ashy-grey paintbrush.

This parcel is also one of the few wildlife corridors connecting undeveloped National Forest lands with the lakeshore. Mitigation measures, including habitat acquisition, need to be included in the proposal. However, it may not be possible to mitigate for the losses of ashy-grey paintbrush and bald eagle habitat.

c) The development would increase the population of Fawnskin substantially, completely changing the character of this small down-to-earth town. A large development of high-density housing is completely out of character for this community.

d) As I understand it, Fawnskin currently has barely adequate water supplies to support the existing population and provide for fire protection. Where will an additional 92 house obtain adequate water supplies? How can there possibly be enough for fire protection? During the drought in the early 1990s, the Big Bear area had a moratorium on building because there wasn't enough water to support any additional residents. In the time between now and then, a number of houses and other buildings have been added in the Big Bear basin.

Has the County evaluated the amount of available water for domestic supplies relative to the existing development and the areas currently being developed to determine whether more residences can be supported given existing supplies? If there wasn't enough water during the drought ten years ago, how can the County justify adding houses at this point? Droughts come in cycles—what will we do in the next drought cycle? Developments should be planned based on the worst-case conditions, not on the best-case conditions when water is plentiful.

Will there be enough water supply for fighting fires in Fawnskin if more is used for domestic supply? I've been told that existing water storage tanks for emergency use are inadequate for the existing residential area of Fawnskin without even adding an additional 92 houses.

I believe this area is at the maximum that can be supported on existing water sources without significantly lowering the water tables and taxing existing supplies.

e) Changing the existing zoning of rural (1house on 40 acres) to roughly ½-acre residential lots in that ecologically sensitive area is absurd and unreasonable. To call that change in zoning a "small change" is completely ridiculous. Putting one and a half houses on those 60 acres could be acceptable, depending on where they were placed, and could be done in a way to preserve the pebble plains habitat, the shoreline willow habitat, and the bald eagle perches. But trying to cram 92 houses and 100 boat docks into 60 acres would completely destroy all of the natural habitat on the parcel.

f) Has Army Corps of Engineers evaluated the boat docks and any associated dredging for impacts to water quality of the lake?

g) The increased traffic levels being put out onto North Shore Drive (Highway 38) will be a nightmare for the residents and visitors of Fawnskin—especially those of us that live on streets off of Canyon Road. Will we have long backups on Canyon Road trying to get out onto North Shore Drive? Part of the reason many of us live or visit Fawnskin is to avoid traffic. North Shore Drive, with all of its curves, cannot support more traffic in the Fawnskin area. Re-aligning the road will not help the traffic flow—it'll only allow the developer to make lots more money by building lakefront homes. Will taxpayer dollars have to pay for this realignment that will only put more money in the developer's pockets?

   As it is now, living ¼ mile away, I often hear traffic noise. Moving the road closer will make that traffic noise a regular factor. Part of the reason I invested in a house and have spent 8 years investing more time and money into my house and land is because of the peace and quiet on this street. I can listen to the wind blowing in the trees and birds singing. But if you move the highway away from the lake, all of the existing residents will have to listen to traffic instead of nature. How can you justify lowering our property values in this way just to provide some developer an opportunity to get top-dollar by building lakefront homes? Leave the highway where it is and, if they have to, build houses above the highway. Do not ruin our neighborhood by bringing the highway closer to us!

h) I have heard from neighbors that the current sewer system is inadequate for Fawnskin and that another proposed development would have to replace the existing sewer line from Fawnskin to Big Bear City's sewage treatment plant. Is that true? Would that be necessary for this project? Shouldn't that be included in the Project Notice as part of the project if it's true and shouldn't the impacts of replacing the existing line be evaluated in the reports? Again, will taxpayer dollars have to fund the sewer line replacement?

i) Any additional development in the Big Bear area should consider natural landscaping, xeriscape landscaping, and other water conservation design features.

j) According to Bear Valley Electric, the Big Bear area is also at its limit for electrical supplies. We often experienced power outages long before "rolling blackouts" hit southern California. For a number of years, BVE has investigated ways to bring more power to the Big Bear basin but, so far, has not been successful. How can the area provide electricity to 92 additional homes if the current utilities cannot support the existing development levels? At a time when Californians are supposed to be conserving in order to make sure we don't have more power shortages, how can the County justify stretching our limited resources even further by considering this proposal? Any additional development in the area should be required to use energy conservation design features, including solar electricity systems so as not to further tax existing power supplies.

k) The County needs to consider more thoughtfully what the existing infrastructure, including utilities, in the Big Bear basin can support and stop approving new developments without regard to limited resources. This area cannot support any more development given the existing limitations the land can provide. A "master plan" is desperately needed for the unincorporated areas of the Big Bear basin, especially Fawnskin, to ensure that development is planned according to the limited resources and cumulative impacts. The county should take the lead on this planning effort and defer evaluating all proposals until it is completed. Without such a planning effort, many of the area's unique resources (including species and habitats found nowhere else) will be lost through incremental impacts and piece-mealed evaluations.

l) The neighborhood is abuzz with rumors of another proposal (Marina Point/Cluster Pines) for 110-unit condominium and marina development at the end of Canyon Road on the lakeside. Has the County evaluated the cumulative impacts of both proposals? Combined with the Moon Camp development, this would add 202 new houses to this town with an existing population of about 300 residents. That is a tremendous jump in population—can the limited resources support that level of increase? An Environmental Impact Report/Environmental Impact Statement, with a cumulative effects analysis, mitigation plan, and other alternatives, is needed for this project.

Please contact me if you have any questions about my comments (909-878-3908). Please add me to your mailing list (use the P.O. Box, not the street address) for this project and any other in the Fawnskin area (including the Marina Point development).

Sincerely,

Robin Butler

Section 15.9
Correspondence

STATE OF CALIFORNIA

GOVERNOR'S OFFICE of PLANNING AND RESEARCH

State Clearinghouse

Gray Davis
GOVERNOR

Steven A. Nissen
DIRECTOR

Notice of Preparation

February 21, 2002

To: Reviewing Agencies

Re: Moon Camp
SCH# 2002021105

Attached for your review and comment is the Notice of Preparation (NOP) for the Moon Camp draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Tracy Creason
San Bernardino County Land Use Services Department
385 N. Arrowhead Ave., 3rd Floor
San Bernardino, CA 92415-0182

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Project Analyst, State Clearinghouse

Attachments
cc: Lead Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
916-445-0613 FAX 916-323-3018 WWW.OPR.CA.GOV/CLEARINGHOUSE.HTML

SEE NEXT

Document Details Report
State Clearinghouse Data Base

SCH# 2002021105
Project Title Moon Camp
Lead Agency San Bernardino County Land Use Services Department

Type NOP Notice of Preparation

Description GPA/OLUD to establish a 95-lot residential subdivision, with 92 numbered lots and 3 lettered lots.

Lead Agency Contact

Name Tracy Creason
Agency San Bernardino County Land Use Services Department
Phone 909 387-4147 **Fax**
email
Address 385 N. Arrowhead Ave., 3rd Floor
City San Bernardino **State** CA **Zip** 92415-0182

Project Location

County San Bernardino
City
Region
Cross Streets Canyon Road and Polique Canyon Road
Parcel No. 0304-082-14, 0304-091-12, 13, 21
Township 2N **Range** 1W **Section** 13 **Base** SBBM

Proximity to:

Highways 38
Airports
Railways
Waterways Big Bear Lake
Schools
Land Use BV/RL-40 (Rural Living - 40 acre minimum lot size)

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Drainage/Absorption; Fiscal Impacts; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Traffic/Circulation; Vegetation; Water Quality; Wetland/Riparian; Wildlife; Growth Inducing; Landuse; Cumulative Effects

Reviewing Agencies Resources Agency; Department of Conservation; Department of Forestry and Fire Protection; Office of Historic Preservation; Department of Parks and Recreation; Department of Fish and Game, Region 6; Native American Heritage Commission; State Lands Commission; Caltrans, District 8; Department of Housing and Community Development; California Highway Patrol; State Water Resources Control Board, Division of Water Quality; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 8

Date Received 02/21/2002 **Start of Review** 02/21/2002 **End of Review** 03/22/2002

Note: Blanks in data fields result from insufficient information provided by lead agency.

SEE NEXT

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BIG BEAR AREA
REGIONAL WASTEWATER AGENCY
P.O. Box 517, 122 Palomino Drive, Big Bear City, CA 92314-0517
(909) 584-4018 • FAX (909) 585-4340
Email: info@bbarwa.org • Internet: www.bbarwa.org

February 28, 2002

San Bernardino County Land Use Services Department/Planning Division
385 N. Arrowhead Avenue
San Bernardino, CA 92415-0182

Attention: Tracy Creason

Subject: Notice of Preparation of Environmental Impact Report for RCK Properties, Tentative Tract No. 16136

The Big Bear Area Regional Wastewater Agency (BBARWA) would like to reaffirm the following: BBARWA has a 10" sewer force main located in the shoulder along the south side of North Shore Drive that passes through Tentative Tract 16136. This force main conveys raw sewage from the County of San Bernardino CSA 53-B sewage collection system to the BBARWA Wastewater Treatment Plant. BBARWA is requesting that the following conditions be placed on this project to protect public health and safety:

1. The Conditional Use Permit should require that the project developer relocate the BBARWA 10" force main by installing new pipe so that it is aligned in the south shoulder along the new location of North Shore Drive. The 10" force main in the new North Shore Drive alignment will allow BBARWA access to maintain and repair the sewer force main. The force main should not pass through proper lots within the proposed tract.

2. Air release valves are located at high elevation points along the force main. Air that is vented from the system may cause odors due to hydrogen sulfide gas that develops seasonally due to low sewage flows and long detention times. BBARWA treats the upstream sewage to minimize odors; however, additional measures should be taken to control nuisance odors due to the close proximity to the tract. The Conditional Use Permit should require that the developer install air release valves and vaults at high elevation points on the new force main. Air release vaults should be large enough to enclose 55-gallon drum carbon filters to control odors.

~ JOINT POWERS AGENCY~
Big Bear City Community Services District • City of Big Bear Lake • San Bernardino County Service Area 53B

SCH#

Resources Agency
- Resources Agency — Nadell Gayou
- Dept. of Boating & Waterways — Bill Curry
- California Coastal Commission — Elizabeth A. Fuchs
- Dept. of Conservation — Rosanna Taylor
- Dept. of Forestry & Fire Protection — Allen Robertson
- Office of Historic Preservation — Hans Kreutzberg
- Dept. of Parks & Recreation — B. Noah Tilghman, Environmental Stewardship Section
- Reclamation Board — Pam Bruner
- S.F. Bay Conservation & Dev't. Comm. — Steve McAdam
- Dept. of Water Resources — Resources Agency, Nadell Gayou

Health & Welfare
- Health & Welfare — Wayne Hubbard, Dept. of Health/Drinking Water

Food & Agriculture
- Food & Agriculture — Steve Shaffer, Dept. of Food and Agriculture

Fish and Game
- Dept. of Fish & Game — Scott Flint, Environmental Services Division
- Dept. of Fish & Game 1 — Donald Koch, Region 1
- Dept. of Fish & Game 2 — Banky Curtis, Region 2
- Dept. of Fish & Game 3 — Robert Floerke, Region 3
- Dept. of Fish & Game 4 — William Laudenslik, Region 4
- Dept. of Fish & Game 5 — Don Chadwick, Region 5, Habitat Conservation Program
- Dept. of Fish & Game 6 — Gabrina Gatchel, Region 6, Habitat Conservation Program
- Dept. of Fish & Game 6 I/M — Tammy Allen, Region 6, Inyo/Mono, Habitat Conservation Program
- Dept. of Fish & Game M — Tom Napoli, Marine Region

Independent Commissions
- California Energy Commission — Environmental Office
- Native American Heritage Comm. — Debbie Treadway
- Public Utilities Commission — Ken Lewis
- State Lands Commission — Betty Silva
- Governor's Office of Planning & Research — State Clearinghouse Planner

- Colorado River Board — Gerald R. Zimmerman
- Tahoe Regional Planning Agency (TRPA) — Lyn Barnett
- Office of Emergency Services — John Rowden, Manager
- Delta Protection Commission — Debby Eddy
- Santa Monica Mountains Conservancy — Paul Edelman

Dept. of Transportation
- Dept. of Transportation 1 — IGR/Planning, District 1
- Dept. of Transportation 2 — Vicki Roe, Local Development Review, District 2
- Dept. of Transportation 3 — Jeff Pulverman, District 3
- Dept. of Transportation 4 — Jean Finney, District 4
- Dept. of Transportation 5 — James Kimmer, District 5
- Dept. of Transportation 6 — Marc Birnbaum, District 6
- Dept. of Transportation 7 — Stephen J. Buswell, District 7
- Dept. of Transportation 8 — Mike Sim, District 8
- Dept. of Transportation 9 — Coleen O'Brian, District 9
- Dept. of Transportation 10 — Chris Sayre, District 10
- Dept. of Transportation 11 — Lou Salazar, District 11
- Dept. of Transportation 12 — Aileen Kennedy, District 12

Business, Trans & Housing
- Housing & Community Development — Cathy Creswell, Housing Policy Division
- Caltrans - Division of Aeronautics — Sandy Hesnard
- California Highway Patrol — Lt. Julie Page, Office of Special Projects
- Dept. of Transportation — Ron Helgeson, Caltrans - Planning
- Dept. of General Services — Robert Sleppy, Environmental Services Section

Air Resources Board
- Airport Projects — Jim Lerner
- Transportation Projects — Kurt Karperos
- Industrial Projects — Mike Tollstrup

- California Integrated Waste Management Board — Sue O'Leary
- State Water Resources Control Board — Diana Edwards, Division of Clean Water Programs
- State Water Resources Control Board — Greg Frantz, Division of Water Quality
- State Water Resources Control Board — Mike Falkenstein, Division of Water Rights
- Dept. of Toxic Substances Cont — CEQA Tracking Center

Regional Water Quality Control Board (RWQCB)
- RWQCB 1 — Cathleen Hudson, North Coast Region (1)
- RWQCB 2 — Environmental Document Coordinator, San Francisco Bay Region (2)
- RWQCB 3 — Central Coast Region (3)
- RWQCB 4 — Jonathan Bishop, Los Angeles Region (4)
- RWQCB 5S — Central Valley Region (5)
- RWQCB 5F — Central Valley Region (5), Fresno Branch Office
- RWQCB 5R — Central Valley Region (5), Redding Branch Office
- RWQCB 6 — Lahontan Region (6)
- RWQCB 6V — Lahontan Region (6), Victorville Branch Office
- RWQCB 7 — Colorado River Basin Region (7)
- RWQCB 8 — Santa Ana Region (8)
- RWQCB 9 — San Diego Region (9)

3. Require that the developer submit plans to BBARWA for approval, including the above items, to meet BBARWA requirements.

BBARWA would also like to comment on Section XVI, UTILITIES AND SERVICE SYSTEMS, SUBSTANTIATION a) on page 32 of the ENVIRONMENTAL CHECKLIST FORM. The last sentence reads, "Therefore, the only alternative to connecting to the public sewer system is an on-site wastewater treatment plant..." If the developer should choose to pursue this alternative, you and the developer should be aware that BBARWA has a Joint Powers Agreement and Operating Agreements with its three member agencies (Collecting Agencies), the City of Big Bear Lake, the Big Bear City Community Services District and the County of San Bernardino on behalf of County Service Area 53-B. Operating Agreement #1, Section 3.05, Other Treatment Plant Works, puts restrictions on the construction and operation of wastewater treatment works by the Collecting Agencies within Big Bear Valley. The section reads, "...none of the Collecting Agencies shall construct, install, acquire or operate any plant, enterprise, works or facilities, of any nature whatsoever for the treatment or disposal of any sewage or wastewater from any area whether within of without its service area, without the consent of BBARWA; nor shall any of the Collecting Agencies contract with any agency other than BBARWA for such treatment and disposal. During the term of this agreement all sewage and wastewater collected by the sewage collection system of each of the Collecting Agencies shall be transported and delivered to the Regional System for treatment and disposal therein."

Please contact me if you have any questions.

Sincerely,

BIG BEAR AREA REGIONAL
WASTEWATER AGENCY

Jerry Rang
Plant Superintendent

C: Wilson So, So and Associates

Jr/jr/County Planning 022802

Creason, Tracy - Planning

From: Westervelt, Gail
Sent: Thursday, February 28, 2002 2:28 PM
To: Creason, Tracy - Planning
Subject: RCK PROPERTIES TENTATIVE TRACT MAP 16136

The following is not an environmental information issue, however Special Districts Department would like to address the streetlight issue with the following comment.

STREETLIGHTING PLANS AND PLAN CHECK FEES MUST BE SUBMITTED TO SPECIAL DISTRICTS DEPARTMENT FOR REVIEW AND APPROVAL. PLEASE SUBMIT PLANS TO GALE GLENN, SPECIAL DISTRICTS DEPARTMENT, 157 W. 5TH ST., 2ND FLOOR, SAN BERNARDINO, CA 92415-0450, TELEPHONE (909) 387-9612.

Also additional information regarding sewer service will be forthcoming from County Service Area 53, Improvement Zone B thru County Water and Sanitation.

Gail A. Westervelt

(909) 387-5829
Assessment Technician
Lien Administration Section
Special Districts Department

South Coast
Air Quality Management District
21865 E. Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • http://www.aqmd.gov

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February 28, 2002

Ms. Tracy Creason
Senior Associate Planner
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

Dear Mr. Creason:

Notice of Preparation of a Draft Environmental Impact Report for General Plan Amendment/Official Land Use District Change, Conditional Use Permit, Tentative Tract No. 16136 (Moon Camp)

The South Coast Air Quality Management District (AQMD) appreciates the opportunity to comment on the above-mentioned document. The AQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the Draft Environmental Impact Report (EIR).

Air Quality Analysis

The AQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The AQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the AQMD's Subscription Services Department by calling (909) 396-3720.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction and operations should be considered. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the evaluation. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the AQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additionally, AQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

AQMD rules and relevant air quality reports and data are available by calling the AQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the AQMD's World Wide Web Homepage (http://www.aqmd.gov).

The AQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. Please call Dr. Charles Blankson, Transportation Specialist, CEQA Section, at (909) 396-3304 if you have any questions regarding this letter.

Sincerely,

Steve Smith

Steve Smith, Ph.D.
Program Supervisor, CEQA Section
Planning, Rule Development and Area Sources

SS:CB:li

SBC020226-07LI
Control Number

Earl & Jeanne Roys

78365 Hwy 111 #134
La Quinta CA 92253

cell: 760-774-9115

Tel: (760) 771-9115
Fax: (760) 771-5915

Date March 1, 2002

To Land Use Services Dept, County of San Bernardino
Fax #909- 387-3223
Advance Planning Division
Att: Tracy Creason

From Earl & Jeanne Roys

Re Tentative Tract Map 16136
RCK Properties, Inc.

Transmittal

We own a lot on North Shore Drive and recently purchased a home at 39974 No. Shore Drive in Fawskin, adjacent to the subject property. We verified the property zoning prior to purchase as rural 40 acre minimum lot size so that it would be maintained for future development as large parcels and substantially the present open space. We obviously oppose any rezoning to a project proposing the maximum density. It would change the rural, picturesque nature of the area to a congested tract community. We are retired seniors and this will dramatically reduce our property values. We researched this location to retire here and you are creating a city setting. Yuk!

This would definitely present a negative impact from our perspective for traffic, the picturesque attitude of the community, our water quality, noise, population, recreation. It would alter the whole composition of the area. Our house faces on Hwy 38 whereas the noise and traffic would be absolutely prohibitive.

The county misrepresented to us the climate of the community if you can alter the current zoning with a tentative map submittal from rural/1 per 40 acres to small residential lots.

If we can be of any assistance in ***opposition*** to this project, please call us. Thank you for your consideration.

Earl & Roys Jeanne M Roys

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P.O. Box 409
Fawnskin, CA 92333
March 2, 2002

Ms. Tracy Creason
Senior Associate Planner
Advance Planning Division
Land Use Services Department
County of San Bernardino
385 North Arrowhead Ave
San Bernardino, CA 92415-0182

Dear Ms. Creason:

We are responding to the "Notice of Preparation of Environmental Impact Report for RCK Propoerties, Inc., Application for Tentative Tract Map 16136" because of our concern that air quality issues be properly addressed in the forthcoming EIR. Let us first briefly introduce ourselves. One of us (BJFP) is currently Professor of Chemistry at the University of California, Irvine and the other (JNP) is Professor of Chemistry Emeritus at the University of California, Riverside, and a founding member and former Director of the University of California Statewide Air Pollution Research Center at UC Riverside; he is currently a research chemist at the University of California, Irvine.

Given that the project involves a proposed change in zoning from BV/R-40 (Rural Living, 40-acre minimum lot size) to BV/RS (Single Residential) with 92 homesites, a number of important air pollution impacts associated with this project must be addressed in the EIR. We have subdivided these air pollution issues into (1) direct emissions of air pollutants ("primary pollutants") associated with the project, both stationary and mobile; (2) the formation of "secondary pollutants" from the reaction of primary pollutants due to this project ; and (3) overall air pollution impacts.

A. DIRECT EMISSIONS

1. Stationary source emissions. The EIR must take into account emissions of all of the species designated as "criteria pollutants" by the EPA. This includes NO_x, CO, SO_2, lead and particulate matter both less than 10 μm in diameter (PM10) and less than 2.5 μm in diameter (PM2.5). In addition, emissions of organics, which lead to the formation of ozone and other secondary air pollutants (see below), must be taken into account.

Particularly of concern are emissions of wood smoke from fireplaces and wood stoves and inserts, and of particles from diesel trucks and cars, the latter both during construction and after project completion. Wood smoke is mutagenic and diesel exhaust has been declared *Type IIA* ("probable human carcinogen") by the International Agency for Research on Cancer and a *Toxic Air Contaminant (TAC)* by the State of California (California Air Resources Board and the Office of Health Hazard Assessment). Attached is a photograph of a typical inversion layer over the lake on a winter morning; the small height of this inversion traps not only wood smoke

(which is the haze that essentially completely obscures the other side of the lake) but also other air pollutants that are not visible. Such low inversions are typical in Big Bear Valley, particularly during the winter, and should be taken as typical of the meteorological conditions in the assessments carried out for the EIR.

It is now accepted by local, state and federal agencies, as well as by air pollution epidemiologists and toxicologists in the scientific community, that particles have large health impacts. For example, particles have been found in epidemiological studies to increase the total mortality rate by 1.5% for each 10 $\mu g\ m^{-3}$ of PM2.5 in air; the increase in the death rate due to chronic obstructive pulmonary disease was about twice this, and the death rate due to ischemic heart disease also increased significantly.

Thus, the EIR must take into account not only the potential for increased toxicity of the particles in terms of carcinogenicity etc., but also in terms of an increased number of deaths due to increased exposure to particles from wood smoke, diesels and automobiles.

In addition, there is increasing evidence of greater health impacts of air pollution on children, e.g. asthma, compared to healthy adults. The proposed project is upwind of North Shore Elementary School, and the increased traffic is literally in the front yard of the school; the EIR must address the impacts on children in the valley, particularly at the elementary school.

2. *Mobile Source Emissions.* Increased emissions will result from both automobiles and heavy duty trucks. Automobile emissions cannot be simply calculated using the Federal Test Procedure which averages over different driving conditions. A large proportion of the emissions will be due to cold starts. In addition, with the increased traffic along the North Shore, traffic will be idling at the stop sign (or signal if one is installed there) at Stanfield Cutoff as well as in the congested traffic along the North Shore. Emissions are larger both during cold start and idling and these higher emission rates must be used in the assessments in the EIR.

The emissions evaluated should include organics, NO_x and particles, as well as those compounds designated as "toxic air contaminants" (TAC) by the State of California such as benzene, 1,3-butadiene and formaldehyde (the latter is also generated in natural gas combustion so should also be treated for emissions from furnaces etc in the new project).

In addition, it is critical that current emissions inventories be used for both mobile and stationary sources. Emissions inventories have historically underestimated emissions from both mobile and stationary sources, and the emissions rates have been updated regularly. It is essential that current emissions inventories (2000 or later) be used in assessing the project impact.

B. Secondary Air Pollutants

Secondary air pollutants are toxic compounds formed by reactions of the direct emissions ("primary pollutants") in air. These include O_3, NO_2, HNO_3 and toxic organics. Ozone (O_3) is particularly of concern and is the air pollutant upon which smog alerts are called. The mountain

communities are not immune from ozone and associated species; in fact, the highest levels of ozone in Southern California are now found in Crestline.

The formation of ozone and other secondary pollutants must be treated in the EIR using state-of –the- art photochemical modeling, not simple box models.

C. Overall Air Pollution Impacts

The EIR must consider the contribution of the proposed project to the existing pollutant burden in the valley in the context of both pollutants that are emitted in the valley as well as those transported in from the Los Angeles air basin. In addition, it must evaluate the increased air pollution in the context of other current and future developments, such as Cluster Pines/Marina Point.

The EIR must consider impacts of both the primary and secondary pollutants on health and visibility, including particularly sensitive portions of the population such as children and adults with existing respiratory and cardiac disease. It is the most susceptible portion of the population that air quality standards, both state and federal, are designed to protect and the project impacts must be evaluated in this context.

Finally, simply calculating emissions and/or modeling will not be sufficient to evaluate the current baseline and the projected project impacts. Where data are not available, e.g. the particle concentrations under conditions such as those on the attached photograph, baseline field measurement studies must be carried out to accurately define the existing conditions upon which the project impacts will be superimposed.

In addition to the air pollution impacts, we are also concerned about the impact of the project on the water supplies in the valley, on habitat for endangered species including bald eagles and several plants, habitat for waterfowl and other birds, and on the aesthetics of the area, particularly public views of, and access to, the lake. We trust these will also be fully treated in the EIR.

Yours truly,

Barbara J. Finlayson-Pitts

B. J. Finlayson-Pitts, Ph.D.

J. N. Pitts, Jr., Ph.D.

cc: Mike Williams, Senior Associate Planner
Supervisor Dennis Hansberger, County Board of Supervisors
Ms. Theresa Kwappenberg, Planning Commission

Creason, Tracy - Planning

From: Barbara J. Finlayson-Pitts [bjfinlay@uci.edu]
Sent: Saturday, March 02, 2002 3:46 PM
To: tcreason@lusd.sbcounty.gov
Cc: mwilliams@lusd.sbcounty.gov
Subject: Comments at meeting

AIR QUALITY ISSUES ASSOCIATED ...

Hi Tracy:

I enjoyed meeting you and Mike at the meeting this morning. I am attaching a copy of the summary of the issues that Jim and I believe is important with respect to air quality for this project. We will also send a more detailed letter shortly.

Best regards,

Barbara

Air

AIR QUALITY ISSUES ASSOCIATED WITH RCK PROPERTIES, INC. APPLICATION FOR TENTATIVE TRACT MAP 16136

B. J. Finlayson-Pitts
Professor of Chemistry
University of California, Irvine

J. N. Pitts Jr.
Research Chemist
University of California, Irvine

and

Former Director of the UC Statewide Air Pollution Research Center, and Professor Emeritus of Chemistry
University of California, Riverside

1. Direct Emissions ("Primary pollutants") Associated with Project:

a. Stationary Sources: NO_x, organics, CO, SO_2, particles, especially from wood burning

i. Photos of inversion over lake and trapping of wood smoke; all other pollutants similarly trapped

ii. Wood smoke is a known mutagen and causes loss of visibility

iii. Particles, including wood smoke, known to cause increase in mortality; Increase of 10 $\mu g\ m^{-3}$ (10 millionths of a gram in 1000 Litres, about 1000 quarts of air) causes increase in total mortality rate of 1.5%; deaths due to obstructive pulmonary disease increase by ~ 3 % and by ischemic heart disease by ~2 %.

iv. Note that in Salt Lake City, use of wood burning fireplaces and wood stoves was forbidden recently for at least 5 days around time of Olympics

iv. Project located upwind of elementary school

b. Mobile Sources: Increase in emissions from automobiles and heavy duty trucks

i. Can't use emissions directly from Federal test procedure since is composed of combination of driving modes. Must take into account increased emissions due to cold starts and to idling from slower traffic caused by development, including emissions of TAC such as benzene and 1,3-butadiene known to be generated by cars.

ii. Diesel emissions particularly of concern; diesel exhaust declared Type IIA ("animal carcinogen and probable human carcinogen") by International Agency for Research on Cancer and a Toxic Air Contaminant by the State of California Air Resources Board and Office of Health Hazard Assessment. Emissions of particles, including ultrafines of increasing concern for public health, and NO_x, must be treated.

c. Emissions Inventories: Must be up to date. Have been grossly underestimated historically, e.g. by factors of 3-4 for organics.

2. Secondary Pollutants: Smog alerts called based on secondary pollutants, those formed by reactions of primary pollutants.

a. O_3, NO_2, HNO_3, particles

i. Need to estimate increase due to project and impact on valley downwind

3. Overall Impacts

a. Need to estimate contribution of project and how adds to current burden of pollutants in valley, both emitted here and transported in, i.e. not in isolation but in context of existing situation and other approved projects such as Cluster Pines to assess cumulative impacts

b. Need to take into account all impacts, including on health, especially children (including elementary school downwind), and visibility

c. Cannot just use models; must do baseline measurements of the criteria air pollutants, including particles, at different times of day, days of week and by season.

Forrest & Diane Shattuck
2605 E. Chestnut Ave.
Orange, CA 92867

TRACY OETTSON
355 N. ARROWHEAD AVE.
SAN BERNARDINO, CA 92415-0182

RECEIVED
MAR 07 2002

March 3, 2002

Tracy Creason, Senior Associate Planner
385 N. Arrowhead Ave.
San Bernardino, CA 92415-0182

Re: Environmental Impact Report - Tentative Tract Map 16136

I object most strongly to the following aspects of the tentative tract map specified above:

1. Aesthetics: the re-routing of Hwy. 18, the construction of a large number of residences, and the elimination of hundreds of old trees will all negatively impact the aesthetics of the area in question and the surrounding environment.

2. Biological Resources: the elimination of the hundreds of old trees and the establishment of what will be an urban residential area will destroy an environment which is home to hundreds of species of plant and animal life.

3. Hydrology/Water Quality: the proposed development will place excessive demands on what is already limited and "strained" water resources for the area.

4. Land Use/Planning: the high density of the proposed development is totally inconsistent with the rural nature of the north shore of Big Bear Lake.

5. Transportation/Traffic: roads serving the north shore of Big Bear Lake are not sufficient to sustain the greatly increased vehicular traffic which will accompany the construction of a large number of residences.

I do not oppose development on general principles. However, I purchased my residence on the north shore of the lake precisely because of its rural nature, and feel that the tract map - as proposed - will have profound, negative impacts on the area for the reasons specified above.

A modified plan, which limits lots to an acre or more, which does not involve re-routing the highway, which does not place a strain on water and utility resources, nor result in a negative impact on air quality, would be more acceptable, in my opinion.

Thank you for your consideration of this.

Sincerely,

Forrest Shattuck

Forrest Shattuck
39567 Oak Glen Road
Fawnskin, CA 92333

Robert R. Henrich
P.O. BOX 282
FAWNSKIN, CA 92333-0282
Tel 909-866-3300
Fax 909-866-4222
Email - rileyh@hotmail.com

RECEIVED
MAR 0 5 2002

March 4, 2002

Tracy Creason,
Senior Associate Planner
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

CC: 3rd. District Supervisor Dennis Hansberger Fax# 909-387-3018
Publisher Bob Gray, The San Bernardino Sun, Email- Bob.gray@sbsun.com

Dear Ms. Creason:

The following are my comments in regards to the Notice of Preparation of Environmental Impact for RCK Properties, Inc. Application for Tentative Tract Map 16136, a General Plan Amendment/Official Land Use District Change, and a conditional Use Permit on Approximately 62 Acres located in the Unincorporated Community of Fawnskin. The Amendment changes a 40 acre minimum(RL-40) to a minimum of 7200 square feet or lot size (RS) for tentative tract #16136.

1. A. I have been advised that my comments should only relate to the technical/legal requirements for land use development on Tract Map 16136. However, I cannot resist commenting on a quality of life value that determined my decision to purchase in the small community of Fawnskin 30 years ago rather than Big Bear Lake. The beauty and peaceful serenity of the area is why I have just made Fawnskin my permanent home. My address at 39659 Flicker Road (lot 57, Henrich Trust) is on the North West border of the proposed tract 16136. I now have a beautiful filtered view of the lake through Ponderosa Trees. Tract 16136 will provide views of two to three levels of houses and a possible view of a 100 slip marina. If Tract 16136 is implemented, the quality of life will match a house adjacent to downtown Big Bear Lake.

B. Track 12217 Book 280 Page 42 recorded 12-20-2000- Marina Point on Big Bear Lake (Cluster Pines). This proposed development abuts Tract 1636 and includes 132 dwelling units on 12.51 acres and includes 175 boat slips. If both 16136 and 12217 are implemented, I should have bought residential property at the South end of Pine Knot Blvd in Big Bear Lake. The fact that the county of San Bernardino has not called for a combined EIR for tract 16136 and 12217 is unconscionable.

Robert R. Henrich
P.O. BOX 282
FAWNSKIN, CA 92333-0282
Tel 909-866-3300
Fax 909-866-4222
Email - rileyh@hotmail.com

The following is an analysis of the current status of tract # 12217 by the Friends of Fawnskin 12/1/01:

"There is nothing in the public record file suggesting the development plan or the tentative tract have been extended beyond 12/9/2000. In order to meet the county code, they would have had to apply for an extension and obtained county approval no later than 11/9/2000(30 days before expiration).

If such an additional extension was requested by the applicant and issued by the County in 2000, it would be at least a second extension, and would need to demonstrate 'exceptional or extraordinary circumstances', as well as consistency with the General Plan, and County Code, etc.

The spirit of the limitations to the timing of project implementation is to assure that a project is implemented under the same circumstances as were considered in the analysis. Circumstances have definitely changed since 1991, and are radically changed from the original analysis in 1983."

Please note that the following concerns for Tract 16136 are much worse if Tract 12217 is added to the equation.

2. My Technical land use comments/concerning Tract 16136 are as follows:

A. **Trees:** I understand that the City of Big Bear Lake is considering an ordinance to protect the Ponderosa Trees. Does 16136 proposal include removing 700 Ponderosa Pines?

B. **Eagle Habitat:** I understand that tract 16136 is part of the eagle habitat and as many as three Bald Eagles have seen perched on one tree in the tract. Is it true that the review of eagle habitat was undertaken in the summer when the eagles are only here in the winter?

C. **State Route 38:** Has highway 38 in the Fawnskin area been designated a scenic highway? Will the 16136 proposal to straighten the highway to allow for waterfront homes change the scenic designation? Will the 16136 proposal eliminate the lake view from the existing highway?

Robert R. Henrich
P.O. BOX 282
FAWNSKIN, CA 92333-0282
Tel 909-866-3300
Fax 909-866-4222
Email - rileyh@hotmail.com

D. **Traffic:** I understand the current technical traffic classification for highway 38 has a poor(congested) rating.. I understand that the 16136 proposal includes improvements for handling traffic. However, is it true that even with the improvements the rating will be even lower be because of the 92 homes that the five cul-de-sacs feeding directly on the highway?

E. **Water:** Is there enough capacity in the water system to support 92 homes? If the system is expanded who will pay for it?

F. **Sewer:** Is there enough capacity in the sewer system to support 92 homes? If the system is expanded who will pay for it?

G. **Air Pollution:** What effect will the 16136 proposal have on air pollution?

H. **100 Slip Marina:** What effect will the new marina have on water quality in the lake?

I. **Light Pollution:** What effect will the 16136 proposal have on the Sun Observatory? In other words will construction, and 92 fireplaces affect the view of the sun for the observatory just east of the proposed 16136 tract.

I appreciate your consideration of my concerns.

Sincerely,

Robert R. Henrich

Henrich
39567 [illegible]
Fawnskin, 92333

Tracy Creason
385 N. Arrowhead Ave.
San Bernardino
CA 92415-0182

Advance Planning

RECEIVED
MAR 07 2002

March 5, '02

Tracy Creason
Land Use Services

As the owner of a home in Fawnskin, the site of the development proposed on Tract Map 16136 is appalling.

In addition to the obvious environmental issues major concerns, I object strongly to negative impact such a huge commercial development would have on this area. Property values would be negatively impacted because the unspoiled rural ambiance would be destroyed.

Sincerely,
David L. Martinez

RECEIVED
MAR 06 2002
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

PUBLIC COMMENT FORM

PROJECT NAME: RCK PROPERTIES, INC.
FILE/INDEX: GPA 5TT/TM 331 = 3N/D1/APN: 0304-091-12*
Environmental Impact Report (EIR) for Moon Camp TT #16136.

NAME AND ADDRESS OF COMMENTOR: (include group or public agency affiliation, as applicable)
Resident: MARLENE THURSTON
HOOK NORTH SHORE
P.O. BOX 185
FAWNSKIN, CA 92333

Telephone Number: 909 878-9265

COMMENTS:

Please provide your comments on potential environmental issues/impacts which you feel should be addressed in further detail in the EIR. Attach additional pieces of paper, as needed.

This form and/or additional comments can be submitted at the Scoping Meeting or mailed to the County of San Bernardino, Advance Planning Division, 385 N. Arrowhead Avenue, Third Floor, San Bernardino, CA 92415-0182, Attention: Tracy Creason, Senior Associate Planner.

WE OBJECT TO THE PROPOSED DEVELOPMENT AND ZONING CHANGE DUE TO:
1. EAGLE HABITAT WILL BE DESTROYED, AS WELL AS ALL OTHER WILDLIFE WE NOW ENJOY.
2. ENDANGERED FLORA & FAUNA WILL BE DESTROYED.
3. REALIGNMENT OF HWY 38 WILL INCREASE TRAFFIC, NOISE, LIGHT & AIR POLLUTION WELL BEYOND TOLERANCE.
4. THE DEVELOPMENT IS TOTALLY INCONSISTENT WITH THE CHARACTER OF FAWNSKIN & WHY I LIVE HERE.
5. THE ELIMINATION OF MORE THAN 700 TREES IS SHAMEFUL.
6. AS SEEN BY ALL, THERE IS SUCH A WATER SHORTAGE THAT WE IN THE VALLEY HAVE BEEN CAUTIONED TO CONSERVE WATER & TO WATER OUR TREES ONLY DURING CERTAIN HOURS. My WELL RAN DRY TWICE LAST YEAR!
7. THE SEWER SYSTEM IS NOT ADAQUIT NOW - THERE IS A TOXIC STENCH THAT INVADES My HOME. MORE WASTE WILL ONLY INCREASE THE PROBLEM
8. THE LACK OF WATER IS A FIRE PROTECTION CONCERN. THERE IS No SURPLUS FOR THE FAWNSKIN FIRE DEPT.
9. EROSION OF OUR MOUNTAIN DUE TO REMOVAL OF TREES & THE CUTTING OF PADS.
10. 92 + CHIMNEYS WOULD CREATE A HE[illegible]

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MAR 1 3 2002

March 6, 2002

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave.
Third Floor
San Bernardino, Ca 92415-0182
Attn: Tracy Creason, Senior Associate Planner

RE: Environmental Impact Report for Moon Camp TT #16136

Dear Ms. Creason:

My husband and I are opposed to the development of Moon Camp in Fawnskin. The obstruction of public lake access, the number and density of units proposed, the proposed realignment of the scenic highway, traffic issues, air pollution, lake pollution, the large number of trees to be removed and destruction of eagle and endangered plant habitat areas, light pollution and an overload on community resources such as water and sewer is a major concern. Fawnskin is a unique historic small town that should not be jeopardized for the sake of money and development. The Big Bear/Fawnskin Area is in need of restoration to existing properties, not development of new properties. Just take a look at the real estate for sale that needs attention. A town like Fawnskin can never be replaced. My husband and I purchased a second home in this area 4 years ago because the town is nature oriented and has such unique character.

I can't even begin to think what a terrible mistake it would be to let the Moon Camp development spoil this one of a kind town.

Progress is not everything.

Thank You,

Mrs. Michael Holland
28081 Morro Court
Laguna Niguel, CA 92677

100 Pine Oak Lane
Fawnskin, CA

DR. R. SHEPHERD
P.O. Box 410
Fawnskin, CA 92333-0410

County of San Bernadino,
Advance Planning Division,
Attention Tracy Creason,
Senior Associate Planner,
385 N. Arrowhead Avenue, Third Floor,
San Bernadino,
California 92415-0182

92415/0182

PUBLIC COMMENT FORM

RECEIVED
MAR 07 2002

PROJECT NAME:

Environmental Impact Report (EIR) for Moon Camp TT #16136.

NAME AND ADDRESS OF COMMENTOR: (include group or public agency affiliation, as applicable)

Dr. Rob Shepherd, President,
1235 Piney Ridge
P.O Box 410,
Fawnskin
California 92333-0410

Earthquake Damage Analysis Corporation
40585 Lakeview Drive, Suite 1,
Big Bear Lake,
California 92315-1967

(909) 86606076 (H)
Telephone Number:

(909) 866- 9414 (O) www.earthquake-damage.com

COMMENTS:

Please provide your comments on potential environmental issues/impacts which you feel should be addressed in further detail in the EIR. Attach additional pieces of paper, as needed.

This form and/or additional comments can be submitted at the Scoping Meeting or mailed to the County of San Bernardino, Advance Planning Division, 385 N. Arrowhead Avenue, Third Floor, San Bernardino, CA 92415-0182, Attention: Tracy Creason, Senior Associate Planner.

One aspect of Environmental Concern that was not included on the list to be addressed by the RBF staff at the Scoping Meeting on Saturday, March 1, 2002 and which, I submit, should be included is **Earthquake Vulnerability** of the developed site.

The proposal to reroute Highway 38 through the property appears to necessitate considerable regrading. If hazards due to slipping and slumping of material from the high side of the new alignment onto the roadway are to be avoided, a wide corridor with relatively gradual sloping embankments will be necessary.

Also, if lots are to developed on the lake edge by relocation of material from elsewhere on the site, the probability of significant earthquake induced shaking in the future should be taken into account by those responsible for the geotechnical design of these lots.

R. Shepherd, Ph.D., P.E.

RECEIVED
MAR 13 2002

David Stoll
73 Old Course Drive
Newport Beach, CA 92660

March 7, 2002

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave. Third floor
San Bernardino, CA 92415-0182

Attention: Tracy Creason, Senior Associate Planner

RE: Environmental Impact Report (EIR)
For Moon Camp TT #16136

Gentlemen:

In 1972 our family purchased a second home in Fawnskin. It is my concern that the historic small town of Fawnskin be preserved and protected for generations to come.

The two proposed developments are of great concern to me. Moon camp and Cluster Pines. The development of these two areas will obstruct public lake access and views from the highway. The number and density of the units proposed will cause traffic problems and air pollution. The removal of trees will affect the eagle and plant habitat areas. There will be a tremendous overload on community resources such as water and sewer.

The proposed development would change the mountain character of the north shore. This project should not be approved. We need to preserve the area for future generations.

Sincerely,

David Stoll

RECEIVED
MAR 0 8 2002

San Bernardino County Land Use Services Department
Advance Planning Division
385 N. Arrowhead Ave. 3rd Floor
San Bernardino, CA 92415-0182

Attn. Tracy Creason
Senior Associate Planner

Re: RCK Properties, Inc.
File/Index Number GPA/TT/M331-8N/01/APN:0304-091-12*

March 7, 2002

Dear Ms. Creason,

First of all we want to thank the County of San Bernardino and your environmental contractor for holding the first public scoping meeting here in Big Bear, and having it on a Saturday so more people could express their views. We hope the other meetings can be held the same way.

We are property owners and full time residents of Fawnskin and we are very much opposed to the zone change from rural living-40 acre minimum lot size (RL-40) to single residential 7200 SF minimum lot size (RS).

We have lived in Fawnskin since 1986. We live on Flicker Road just north of the proposed development. We live on a hill and when we first occupied our home we would run out of water on Holiday Weekends in the summer. Our water pressure wasn't just low we were completely out of water. Besides the inconvenience it caused, if their had been a fire in the neighborhood it could have been a disaster. We are in the midst of a drought and the water availability should be studied very diligently. We understand the developer plans to place two wells on the property. What effect will this have on the homes in Moon Camp that are on wells at this time.

The sewer capacity should be looked into. There is a tract already approved at Cluster Pines for 132 townhouses that needs to be considered when figuring the sewage from Fawnskin. Flicker Road was overlayed with asphalt pavement in the summer of 2000. The manholes and water valves have not been raised yet. If the agencies that are responsible for this can't complete their work in almost two years why add more facilities to the system.

In winter we see the Bald Eagles perching in the pine trees near the lake looking for food. They spend most of their time perched in the trees nearest the lake. When the lake front properties are developed most of these trees will be destroyed. The Bald Eagles will search for new habitat. Of the Bald Eagles counted in the Big Bear Valley most of them have been counted in Fawnskin. It would be a disgrace if they were chased away by over population of humans. We have deer in the hills above Fawnskin. They come down from the hills at night to drink water from the lake. They come through the Moon Camp property to do this.

The tract map shows the highway being moved from its present location near the lake, to an area toward the center of the development. The reason for this is to make more lake front properties. This will take away the opportunity to see the lake from the highway. This also stops people from using the lakefront. Traffic will increase significantly on the highway and in Fawnskin. The speeds will increase because the curves will be taken out causing hazards at each end of the development.

We are very concerned about the number of adult trees to be removed. The plans call for 735 trees to be removed. This is only for the roadways. When the houses are built they will probably remove that amount again. Trees this size will not be grown in our lifetime, or in our grandchildren's lifetime.

This project will impact our emergency services. Our hospital is worked to capacity during the ski season. The Fawnskin fire department is manned by a very short staff and is called all over the valley, so they may not available when needed. The sheriff 's department is in Big Bear and it takes time to get to Fawnskin now.

If you go across the lake and look at the Papoose Bay and Hamilton Estates projects, you will see why we are against this project. There are very few trees and the houses are very close together. We don't need this kind of a development in Fawnskin.

Like most of our neighbors we moved to Fawnskin to be on the quiet side of the lake. On holiday weekends the traffic in Big Bear Lake is very congested. We try to avoid going over to that side of the lake if possible. This development will increase the traffic flow in Big Bear as well as Fawnskin. This property was zoned for one house per forty acres. It would not change the community that much. By changing it single residential 7200 square feet it changes the impact a great amount. Please reject this zone change.

Thank You,

James C. McGrew

Lola E. McGrew

39760 Flicker Road
P.O. Box 493
Fawnskin, CA 92333-0493

RECEIVED
MAR 13 2002

Linda Stoll
73 Old Course Drive
Newport Beach, CA 92660

March 7, 2002

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave. Third floor
San Bernardino, CA 92415-0182

Attention: Tracy Creason, Senior Associate Planner

RE: Environmental Impact Report (EIR)
For Moon Camp TT #16136

Gentlemen:

In 1972 our family purchased a second home in Fawnskin. It is my concern that the historic small town of Fawnskin be preserved and protected for generations to come.

The two proposed developments are of great concern to me. Moon camp and Cluster Pines. The development of these two areas will obstruct public lake access and views from the highway. The number and density of the units proposed will cause traffic problems and air pollution. The removal of trees will affect the eagle and plant habitat areas. There will be a tremendous overload on community resources such as water and sewer.

The proposed development would change the mountain character of the north shore. This project should not be approved. We need to preserve the area for future generations.

Sincerely,

Linda Stoll

Linda Stoll

Concerning
Moon Camp: TT #16136 3/8/02

RECEIVED
MAR 13 2002

Dear Sir, (1)

As a resident of Fawnskin I have several grave concerns about the proposed project & the ensuing E.I.R.

(1.) From an ecologic standpoint the Biology of the area needs to be observed for a full year.
i.e. Wild-life in Varying Seasons
(2) plants in Varing Seasons
(3) animal corridors during Varried Seasons.
(4) Migratory birds in Varying Seasons
a. Eagles
b. blue Herons
c. Ducks & other Shore birds

(2) The changing of the road will permanently deprive Residents & Visitors visual access to almost a mile of Shore line

(3.) Hundreds of Sparling trees will be lost impacting from the boating side of the lake for residents & visitors.

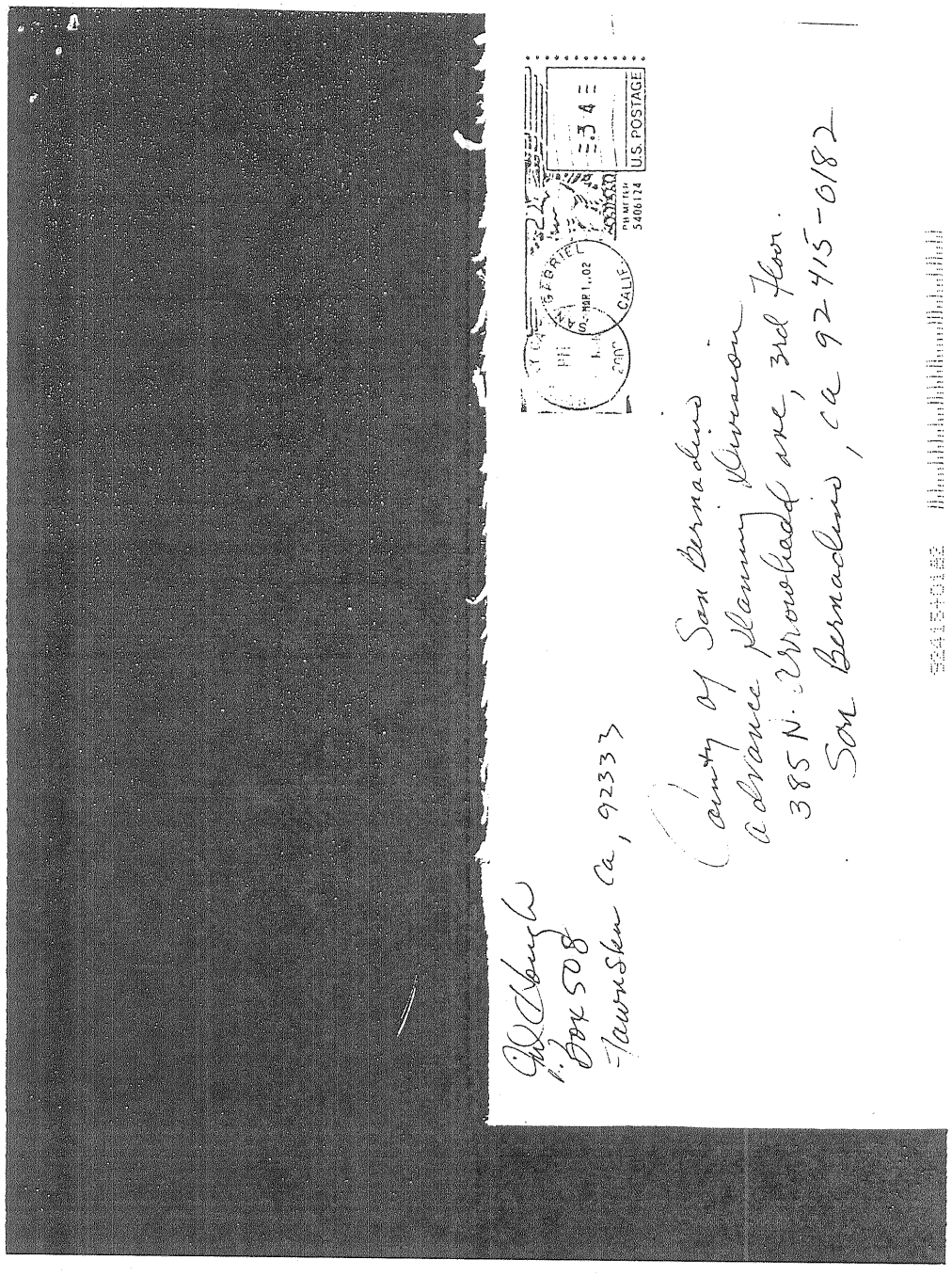
(4) pollution - both solid & air pollution will tax the already stressed ecosystem (2)

(5) Water, sewers, electrical are already taxed (over used) in the Yucaipa & Total Inglewood Valley.

(6) Shoreline access is minimal now at Inglewood & is if fair to more in the direction of Arrowhead where the public loses almost all access.

Sincerely

J.A. Hough DVM
Box 508 Yucaipa
Ca 92333



J.A. Hough
P.O. Box 508
Yucaipa Ca, 92333

County of San Bernardino
Planning Division
Advance Planning
385 N. Arrowhead ave, 3rd Flor.
San Bernadino, Ca 92415-0182

March 8, 2002
County of San Bernadino
Advance Planning Division
385 N. Arrowhead Ave, Third Floor
San Bernadino, CA 92415-0182

RECEIVED
MAR 12 2002

RE: EIR for Moon Camp TT #16136

Dear Tracy Creason,

I am very concerned about numerous issues that I would like thoroughly investigated in the EIR.

The water level in the lake has dropped dramatically in the last few years, this year has also seen little or no rain. If this drought were to continue, or if we should be lucky enough to get the average amount of rain, how will the additional boat traffic and personal water craft raise pollution levels in the lake. Also there will be runoff from the landscaping of these new homes (pesticides and fertilizers), what will the additional impact be from them?

We are currently on water restrictions, who will provide the additional water need for all the new developments that are being planned.?

The current sewer system is currently having a difficult time as there are sewer gases leaking into many homes along the lakefront, the additional homes will only increase this problem.

The air quality could also be impacted significanlty from the additional traffic on North Shore Rd. Also there are an additional 92 homes with at least one wood burning fireplace each. How much smoke will fill the valley in the mornings, especially on the weekends? I personally do not use my fireplaces anymore because of this.

How will the air quality affect the wildlife, especially the eagles, since the pollution will be at it's peak when they are nesting?

The proposed tree removal for the roads is almost 25% of the trees. Many of these would be old growth trees and will not be able to be replaced. There are many types of wildlife that use these trees for nesting, lookouts, shelter, etc. What will the initial impact be to the wildlife? Also, approximately how many more trees will be removed to create the 92 homesites? Based on the other new developments in the area, probably another 25%. The removal of all these trees will also have an impact on the air quality, what will that impact be?

We purchased our home in Fawnskin because of the Rural zoning. Why should a developer be allowed to change the zoning, as an individual it would probably be impossible for me to sub-divide my property. This will impact all property owners that have invested in this area because of the zoning. If we wanted to live with high-density urban zoning we would have purchased such a property.

The South Shore of the lake is already heavily burdened by traffic. The stores are impossible on the weekends. The medical facilities are so overworked that the LA Times ran a story about the emergency room on weekends. Will the developer increase funds to help relieve the additional burdens placed on these sources?

In the past the county has not had a very positive record for enforcing mitigation terms and conditions presently set. How would they be enforced for this project and any future projects. It also appears that this developer does not have a good record regarding adhering to their past terms and mitigation from other projects in the valley. How will this be addressed?

The quality of life on the North Shore is irreplaceable. There is a small town ambiance that will never be recovered. Residents of the South Shore come to the North Shore when life is to hectic at home because of this ambiance.

We have two suggestions for this property. The first one is to develop the property as currently zoned for rural property. The second would be to sell the land to the forest service at reasonable market value for 64 acres of rural property.

Sincerely,

Marla Herman

Marla & Scott Herman
954 Chinook
P. O. Box 426
Fawnskin, CA 92333

RECEIVED
MAR 11 2002

March 8, 2002

Tracy Creason,
Senior Associate Planner
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

Dear Ms. Creason:

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HERMAN
621 AVENUE "A"
REDONDO BEACH, CA 90277

County of San Bernardino
Attn: Planning Division
385 N. Arrowhead Ave, 3rd Floor
San Bernardino, CA 92415-0182

Attn: Tracy Creason

92415+0182

The following is an analysis of the current status of tract # 12217 by the Friends of Fawnskin 12/1/01:

"There is nothing in the public record file suggesting the development plan or the tentative tract have been extended beyond 12/9/2000. In order to meet the county code, they would have had to apply for an extension and obtained county approval no later than 11/9/2000 (30 days before expiration).

If such an additional extension was requested by the applicant and issued by the County in 2000, it would be at least a second extension, and would need to demonstrate 'exceptional or extraordinary circumstances', as well as consistency with the General Plan, and County Code, etc.

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Please note that the following concerns for Tract 16136 are much worse if Tract 12217 is added to the equation.

2. My Technical land use comments/concerning Tract 16136 are as follows:

A. **Trees:** I understand that the City of Big Bear Lake is considering an ordinance to protect the Ponderosa Trees. Does 16136 proposal include removing 700 Ponderosa Pines?

B. **Eagle Habitat:** I understand that tract 16136 is part of the eagle habitat and as many as three Bald Eagles have seen perched on one tree in the tract. Is it true that the review of eagle habitat was undertaken in the summer when the eagles are only here in the winter?

C. **State Route 38:** Has highway 38 in the Fawnskin area been designated a scenic highway? Will the 16136 proposal to straighten the highway to allow for waterfront homes change the scenic designation? Will the 16136 proposal eliminate the lake view from the existing highway?

D. **Traffic:** I understand the current technical traffic classification for highway 38 has a poor(congested) rating.. I understand that the 16136 proposal includes improvements for handling traffic. However, is it true that even with the improvements the rating will be even lower be because of the 92 homes that the five cul-de-sacs feeding directly on the highway?

E. **Water:** Is there enough capacity in the water system to support 92 homes? If the system is expanded who will pay for it?

F. **Sewer:** Is there enough capacity in the sewer system to support 92 homes? If the system is expanded who will pay for it?

G. **Air Pollution:** What effect will the 16136 proposal have on air pollution?

H. **100 Slip Marina:** What effect will the new marina have on water quality in the lake?

I. **Light Pollution:** What effect will the 16136 proposal have on the Sun Observatory? In other words will construction, and 92 fireplaces affect the view of the sun for the observatory just east of the proposed 16136 tract.

I appreciate your consideration of my concerns.

Sincerely,

Marla J. Henrich

Marla J. Henrich
P O Box 282
Fawnksin, CA 92333
909-866-3300

RECEI
MAR 14

County of San Bernadino
Advance Planning Division
Attn: Tracy Creason, Sr. Asso. Planner
385 N. Arrowhead Ave, Third Floor
San Bernadino CA 92415-0182

March 8, '02

Re: EIR for Moon Camp TT # 16136 & Cluster Pines (Marina Development)

Dear Ms. Creason,

When we purchased our home on Flicker Rd. adjacent to the proposed Moon Camp project, we thought that maybe in the distant future there could be limited development similar to the rest of Fawnskin. To learn that there are two proposed developments, Los Angeles County style, is alarming. That type of development is what we were trying to escape for our future retirement home. We also chose Fawnskin over Big Bear Lake for its special character.

An EIR is a good start. Fawnskin is a jewel of San Bernadino County. We expect the EIR to be critical of any change to reduce its shine. My concerns:

1. Is the proposed density compatible to Fawnskin & can the current & future planned and approved infrastructure support that density?
2. Won't the proposed change to State Highway 38 create a speedway for a short distance? Isn't State Highway 38 (North Shore Road) too scenic to be a speedway even for a short distance?
3. Doesn't San Bernadino County or the U.S. Forrest Service have laws regarding tree removal over a certain diameter or a minimum height? Wouldn't that be the case in an eagle habitat?
4. Is there a potential problem with pollution to the lake in the Fawnskin area with the proposed density and run off from both of these projects?
5. Is Cluster Pines actually approved to go from a camp ground to condominiums? Was there an error in the approval process many years ago that could void the prior approval? Shouldn't that project also be one that would be appropriate in Fawnskin?
6. With the two projects combined 175 marina slips plus many new water front docks, will there be shoreline erosion? Will the water foul be driven away?

I would appreciate receiving copies and future notifications of any thing pertaining to these two projects.

Sincerely,

Terry Payne

39651 Flicker Rd.
Fawnskin

Terry Payne & Jack Bessey
24816 Aden Ave.
Newhall CA 91321

John A. Piorkowski

RECEIVED
MAR 11 2002

March 9, 2002

Senior Associate Planner
Tracy Creason
County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave.
San Bernardino, Ca.
92415

Dear Friend,

Regarding the Environmental Impact Report for Moon Camp TT#16136. I oppose the approval of this project based on environmental considerations.

My first concern is the impact this development would have on increased traffic congestion. Big Bear on any given weekend is suffering from traffic congestion, even traffic jams. Not only does the town itself suffer, the highways in and out of the area also suffer. The proposed project would add to the conjestion and resulting air and ground pollution. How much can the lake and surrounding vegetation take?

A second concern is the impact the project would have on the lake. A 100 slip private marina impinges on the publics enjoyment of California's public recreational lands. Is it even legal to privatize part of the lake? Again, there is the issue of congestion on the lake and resulting pollution.

My third concern is the issue of vacation rental property, that is, condo buyers who turn their properties into vacation rentals. This practice impacts motel/hotel businesses, local restaurants, traffic congestion, pollution, and has a general degrading effect on the entire area. Renters do not have the same high regard for an area that owners do.

Finally, Big Bear has a concern over it's quality and supply of water. How long can this unpredictable and undependable (we are currently in a drout and the lake level is down) resource sustain all the existing demands?

Sincerely,

John A. Piorkowski

RECEIVED
MAR 12 2002

March 9,2002

To: County of San Bernardino , Advanced Planning Division
From: Mr.& Mrs. David Bollier
Subject: Environmental Impact Report (EIR) for Moon Camp TT#16136
Cluster Pines development
Attention: Tracy Creason. Senior Associate Planner

We are writing this letter regarding our concerns over the above developments in Fawnskin. Our reason for moving to Fawnskin was because we wanted to live in a small community for the peace and quit. We believe everybody has the right to sell their property, but this is not what Fawnskin needs. It will increase traffic, more taxes and undue hardships on our community.

The best solution would be, for the United States Forest Service to purchase the property, with funds from the existing grants the federal government allocated to them for the purchase of private lands in and around the national forest to extend its boundaries. We are sure this would meet with everybody's approval.

In the matter of Cluster Pines condominium development, we feel the same way. It used to be a nice campground and should be reopened as such. There is a great need for another campground in the area and I am sure it would be very profitable to the owners as it was in the past.

Sincerely,

Robert F. Hawkins
Robert F. Hawkins
Kay Hawkins
Kay Hawkins

1

Robert & Kay Hawkins
P.O. Box 57
Fawnskin, Ca.
92333

County of San Bernardino advance Planning Division
385 N. arrowhead ave. third floor
San Bernardino, CA. 92415-0182

Attention: Tracy Creason
Senior associate planner

92415/0182

RECEIVED
MAR 11 2002

March 9,2002

To: County of San Bernardino , Advanced Planning Division
From: Mr.& Mrs. David Bollier
Subject: Environmental Impact Report (EIR) for Moon Camp TT#16136
Cluster Pines development
Attention: Tracy Creason. Senior Associate Planner

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Sincerely,

David W. Bollier
David W. Bollier
Judith Bollier
Judith Bollier

David W. Bollier
P.O. Box 57
Fawnskin, CA 92333

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave 3rd Floor
San Bernardino CA, 92415-0182

Attn Tracy Creason Senior Associate Planner

March 09,2001

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MAR 15 2001

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave. Third Floor
San Bernardino, Ca 92415-0182

Attention: Tracy Creason, Senior Associate Planner

Project: ***Environmental Impact Report for Moon Camp TT # 16136***

As a resident of Fawnskin. California I would like to go on record with the following objections to the above stated project.

1. Increased Auto emissions will certainly be the result of the more cars, more wood burning stoves due to population growth, and pollutants due to more recreational boats and ATV's.

2. Our Lake is already suffering from draught and water shortages will certainly only increase with the added burden of this proposed project. Please analyze the expected runoff levels and sediment loads and disclose info.

3. Power blackouts will occur frequently as a result of increased electrical use.

4. Fawnskin simply doesn't have the sewer capacity needed to provide sanitary overload usage.

5. The removal of 730 trees is appalling. It is rape of the hillside which cannot be replaced adequately.

6. It is fact that many Eagles return year after year to these trees. Removal will disrupt the natural habitat of this fine birds. This is also natural habitat to many other animals and birds. What will become of this animals?

7. There are areas of plant habitat that is peculiar only to Big Bear. If these are destroyed in the name of progress, we can say goodbye to certain plants forever.

I feel that the above issues should be addressed with respect to those of us who live here. We do not want this project. It is not welcome. I wonder how much the traffic will increase and how much longer my driving time will be due to it. I moved into this area to get away from the pollution, noise, and congestion.

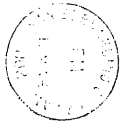
Thank you for giving consideration to my concerns and to those of my neighbors. I am satisfied that you will do your best to understand our dilemma and use appropriate measures to evaluate this situation.

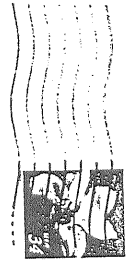
Kathleen London
PO Box 512
Fawnskin, Ca 92333

HERBERT V. CLOTTS
42315 LACOVIA DRIVE
INDIO CA 92201

COUNTY OF SAN BERNARDINO
TRACY CREASON
ADVANCED PLANNING DIVISION
385 N. ARROWHEAD AVE.
SAN BERNARDINO CA 92415-0182

92415/0182





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MAR 1 3 2002

HERBERT V. CLOTTS
SHIRLEYNE A. CLOTTS
PO BOX 24
FAWNSKIN CA

March 10, 2002

COUNTY OF SAN BERNARDINO
ADVANCED PLANNING DIVISION
385 N. ARROWHEAD AVE
SAN BERNARDINO CA 92415-0182

ATTENTION: TRACY CREASON, SENIOR ASSOCIATE PLANNER

EIR MOON CAMP TT#16136

DEAR SIR OR MADAM:

IN REGARDS TO THE ABOVE ENVIRONMENTAL IMPACT STUDY IN FAWNSKIN WE ARE VERY MUCH OPPOSED TO THE CURRENT PLANS BEFORE YOU FOR HIGH DENSITY DEVELOPMENT IN A FRAGILE, PRISTINE, ENVIRONMENT IN ONE OF THE FEW AREAS IN THE BIG BEAR LAKE REGION THAT HAS MANAGED TO RETAIN ITS UNIQUE RURAL ATMOSPHERE

I AM SURE ALL OF THE MANY ENVIRONMENTAL HAZARDS ASSOCIATED WITH A DEVEOPMENT OF THIS MAGNTUDE HAVE BEEN POINTED OUT TO YOU AND I SHALL NOT LIST THEM HERE ONLY ASK YOU TO REVIEW THEM CAREFULLY AND NOT MAKE HASTY DECISIONS ON A COMPLEX ISSUE SUCH AS THE ONE BEFORE YOU,

LETS LEAVE ONE AREA ON BIG BEAR LAKE OPEN WHERE PEOPLE CAN COME AND SEE WHAT BIG BEAR LAKE USE TO LOOK LIKE AND WHERE THEY CAN DRIVE ALONG THE LAKE AND HAVE ACCESS TO IT IF THEY SO CHOOSE. THEY COME FROM THE CITY TO GET AWAY FROM PEOPLE, CARS, K-MART'S, SUPER MARKETS, SMOG, ETC. PLEASE HELP US TO SAVE ONE AREA IN BIG BEAR WHERE THEY CAN STILL DO THAT. .....

SINCERELY

Herbert V. Clotts

Shirleyne Clotts

HERBERT V. CLOTTS

SHIRLEYNE A. CLOTTS

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MAR 1 3 2002

March 10, 2002

Mike Williams and Tracy Creason, Senior Associate Planners
County of San Bernardino, Advance Planning Division
385 N. Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182

Re: Environmental Impact Report (EIR) for Moon Camp TT #16136

I am writing because of zoning changes proposed for a small community in the Big Bear Valley of San Bernardino County, Fawnskin. RCK Properties, Inc. is attempting to change the zoning of undeveloped acreage east of Canyon Drive from Rural Living to Single Residential with the intention of constructing 92 homes. This is a large development that will stretch through a riparian forest of juniper and conifer-covered hills. It is to include the building of 100 boat slips and a rerouting of a scenic highway. This action will remove the hilly landscape, lake access and hundreds of trees. The entire forest habitat that now exists will be altered forever.

This proposal brings many potentially serious problems for those who have come to this valley seeking the life style it has to offer. Members of this rural mountain community are greatly concerned about many aspects of this proposed development. I would like to propose the following questions and ask that your study carefully consider the following:

- How many trees will the development destroy? The number listed in the initial study addresses those to be removed to reroute the highway. How many additional trees will be removed to clear the land and build homes? Construction in this valley by those able to afford large homes in similar developments are often 7,000 to 8,000 + square feet. How will these huge footprints requiring the removal of animal and plant habitat affect the entire environment characterizing *every resident's* reason for settling in this remote and rural valley?
- How will the destruction of the habitat and lake access for the many wild animals living in the adjacent forest stress or destroy these animals? The encroachment of humans must be a serious concern of those doing this study. How will the removal of animal corridors in this development affect this entire valley?
- Substantial paving will be included in this development to serve this proposed density. How will this affect all aspects of the environment? How will paving, building construction, high water consumption living and landscaping, emissions from fossil fuel burning automobiles, and high density populations alter the climate of this community for all inhabitants?
- How will the destruction of this bald eagle habitat contribute to the survival of this precious species? Are requirements for eagle density and competition for feeding being considered?
- Are the expert biologists serving the United States Forest Service and stationed in this community being consulted? They have a first hand knowledge of this forest and how the humans who inhabit and visit it, affect its very survival.

- Will this study consider the entire year and multiple years when addressing the impact of the increase in homes, cars, and people being proposed for this forest and this lake? Seasonal crowds are increasing as the population of the adjoining areas increase. How will the recreation of those unable to afford home ownership in this valley be affected?
- How will each of the zoning requirements affect the human inhabitants and the habitat and environment of plants and animals in this area? Will the Rural Living zoning or the Single Residential zoning be best for this tract of land and all dependent upon it for survival?

The EIR being conducted certainly addresses many of the concerns of the residents of this valley. The meeting held here by the county was well conceived and the county planners noted and seemed to give full attention to the concerns presented by the people able to attend the meeting. I have a great deal of trust in the sincerity and the professionalism demonstrated at that meeting. I do however, have major concern, no *fear*, that the most important question will not be addressed as the study is undertaken. This question is: Is it fair to allow monetary considerations of the few to totally destroy the habitat of the many who are here? Who protects the interests and requirements of wild animals that are not on the federal lists of endangered and threatened animals and plants? Who protects our interests? Isn't that why the original zoning was assigned this tract of land?

Please do not alter this unique community by this drastic re-zoning. To do so would be to destroy the very reason that people choose to come to this area. There are many houses and lots for sale throughout the valley that will enable full time, weekend, and holiday visitors to enjoy this mountain community. It is my greatest hope that the Land Use Services Department will be the agency that generations to come will respect and thank for its common sense approach to the use of this land.

Sincerely,

Glenda Akins

Dr. Glenda L. Akins
P.O. Box 6122
Big Bear Lake, CA 92315

Mike Williams and Tracy Creason, Senior Associate Planners
County of San Bernardino, Advance Planning Division
385 N. Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182

92415+0182

Kim Munoz
P.O. Box 6578
Big Bear Lake, CA 92315

March 10, 2002

Mike Williams and Tracy Creason, Senior Associate Planners
County of San Bernardino, Advance Planning Division
385 N. Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182

RECEIVED
MAR 19 2002

Re: Environmental Impact Report (EIR) for Moon Camp TT #16136

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This proposal brings many potentially serious problems for those who have come to this valley seeking the life style it has to offer. Members of this rural mountain community are greatly concerned about many aspects of this proposed development. I have the following questions:

- How will the water and sewer systems in Fawnskin be impacted? Won't those systems already taxed to their peak levels contribute to more habitat destruction if their capacity must be enlarged?
- How will lake water pollution affect all members of our community if this development proceeds and the runoff from increased habitat and 100 boats are added to the lake? Will you analyze and disclose the expected runoff levels and sediment loads as this EIR is developed?
- How will the increased congestion in this small community change the land usage if roads are widened to facilitate the increased traffic?
- How will the reduction of the contributions of hundreds of trees affect the air quality of our valley?
- How will the additional encroachment of humans affect the animals and plants of the entire forest?
- How will the destruction of the bald eagle habitat be mitigated by a few saved trees? How will this serve their needs when they utilize multiple trees in this area now?

Please do not allow this development to alter this unique community by the drastic re-zoning being proposed. To do so would be to destroy the very reason that people choose to come to this area.

Sincerely

Kim Munoz
P.O. Box 6578
Big Bear Lake, CA 92315

Kim Muñoz
resident of Fawnskin

March 11, 2002

RECE
MAR 19 2

Tracy Creason, Senior Associate Planner
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

RE: Environmental Impact Report for RCK Properties, Inc. application for tentative tract map 16136 and conditional use permit on 62 acres located East of Canyon Drive, in Fawnskin, CA

Dear Ms. Creason:

We are concerned about a number of aspects of RCK Properties' proposed land development and highway relocation, and for the reasons below, we strongly oppose the proposed changes that will most certainly have a number of serious negative environmental effects.

The widening and relocation of the highway to allow the addition of 95 new homes (where current zoning allows only one) will bring with it large numbers of people and cars, adding to congestion, traffic, and increasing highway noise levels considerably in this otherwise quiet and rural area. Living near the highway we are acutely aware of traffic noise. As it is we are often awakened many times during the night by traffic noise, and understand that the proposed changes would heavily impact the traffic flow along SR38, the only access to the site.

It is also distressing to learn that the highway relocation would call for the destruction of many hundreds of trees in an area that currently has the look of a beautiful wilderness zone. These trees are large and plentiful and add immeasurably to the public's enjoyment of the highway. We've also participated in a number of bald eagle counts and know from experience that the area under consideration by the developer is well used by bald eagles for nearly six months of the year. Without the trees, and with the added commotion of homes, cars, and people, the eagles and other wildlife will lose a valuable habitat area forever.

We are further concerned about the runoff and other groundwater problems that could result from this project. These will not be cabins surrounded by old growth trees and naturally landscaped in existing pines and bushes. Rather, the size of the homes will most likely be extremely large, necessitating the removal of hundreds of trees, to be replaced by gardens and lawns whose fertilizers will contaminate ground and lake waters.

In closing we want to reiterate that we feel strongly that the proposed development will have serious and irreversible consequences. It would destroy views long enjoyed by residents and visitors. It would grossly increase traffic, noise, and congestion. It would most certainly rob wildlife and eagles of natural habitat. It would mean losing hundreds

of scenic trees and eliminate any public enjoyment of the area. In addition, it will adversely affect the water quality of both ground water and lake water.

Please take these negative aesthetic, land use, noise, traffic, and water quality factors into consideration as you prepare the environmental impact report on this disastrous proposal.

Thank you so much.

Sincerely,

Doris Griffin

Doris Griffin
23871 Willows Drive, #224
Laguna Hills, CA 92653

13371 Shapell
Garden Grove, CA 92844

RECEIVED
MAR 13 2002

March 11, 2002

Tracy Creason
County of San Bernardino, Advance Planning Division
385 N. Arrowhead Ave, Third Floor
San Bernardino, CA 92415-0182

Dear Tracy Creason,

Subject: EIR for Moon Camp TT #16136

We are part time residents, taxpayers, and property owners for the residence located at 956 Deer Trail Lane; and have been in joint ownership of this property for more the fifteen years.

We wish to state and make clear my strong objection to development proposal.

Our objections are as follows:

- This project will pose a significant increase in traffic in the local area, with impacts including additional air pollution, increase in number of vehicle / traffic related injuries, increase risk to pedestrian traffic, increase in noise pollution, and increased pressure, stress, and danger to local wildlife.
- This project will destroy over 700 trees in the project area.
- This project will further impact and cause additional stress on the eagle habitat and other local flora and fauna.
- This project will impact endangered plants in the area.
- This project will have a significant and detrimental impact on the character and nature of Fawnskin and the local area.

Other maters that you and the county must consider are the additional impacts on lake view and more restricted public access to the lake, increased load on the sanitary sewer system, increased load on the water supply system, increased risk, load, and burden to the fire department, and increased risk, load, and burden to the national forest.

In closing, let us again state that our family and we strongly object to this development project. We would like to request that we are notified of all hearings and meetings with respect to this project, and that they take place on Saturdays to allow more concerned neighbors to attend. We would also like to request that a thorough and proper Environment Impact Report be prepared for the entire project.

Sincerely,

D--B—

Patricia C Bench

DeVon Bench and Patricia Bench

Natalie L. Marks
P.O. Box 229
Fawnskin, CA 92333-0229

92415-0182

RECEIVED
MAR 14 2002

March 11, 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave, Third Floor
San Bernardino, CA 92415-0182

Re: Environmental Impact Report
For Moon Camp TT #16136

Attn: Tracy Creason
Senior Associate Planner

Re: RCK, Applicant, Tentative Tract 16136

I object to the above project (Tentative Tract 16136) for the following reasons:

1. The number of scenic trees that are to be removed resulting in reducing the overall attraction of the area and destroying approximately one quarter of an endangered species habitat. (i.e. eagle in the affected area.) A study short of one year would not assess the impact on animal life.

2. Noise Pollution and Safety:

   a) Moving State Route 38 northward will result in traffic being closer to the existing homes above the proposed development .
   b) Increased traffic by the proposed development (900 additional autos per day).Holiday traffic is already unacceptable in the valley and increased traffic will be a danger to pedestrians and school children where the crossing of the highway is necessary. Children in Fawnskin are in school many of the holidays down the hill.
   c) From additional boats of the proposed marina, causing further pollution due to the sound traveling across the lake. Fawnskin and the North Shore have always had the reputation of being a quiet, serene, uncongested community that is lake assessable and with this new proposed project, we will lose every quality that we chose to live here.

3. Air Polution

   Additional fireplace burnings and other emissions of the additional proposed homes. Boat emissions caused by a 100 boat marina. We already have a problem with the existing conditions of fumes during the boating season when the air is trapped in the valley, caused by heat and lack of wind.

4. Object on the basis that with people now building large houses on minimum-sized lots in Big Bear, any downzoning would be inconsistent with the mountian character

of Fawnskin.

5. Object on the basis that currently there is insufficient water in Fawnskin to support 92 additional residences.

6. Object on the basis that State Route 38 in that area could not adequately support the increased traffic flow in that area.

7. Object on the basis that a 92-home subdivision will cause serious light pollution in the Fawnskin area

8. Object on the basis that there has been no EIR with respect to entire project.

City standards are not applicable. We are not an urban area. Mitigation should be directed to Fawnskin only.

Thank you,

Gerald and Natalie Marks
39739 Flicker Road
Fawnskin, CA 92333-0922

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Gray Davis
Governor

March 11, 2002

Ms. Tracy Creason
Land Use Services Division
County of San Bernardino
385 North Arrowhead Avenue
San Bernardino, California 92415

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE MOON CAMP PROJECT (SCH #2002021105)

Dear Ms. Creason:

The Department of Toxic Substances Control (DTSC) has received your Notice of Preparation (NOP) of a draft Environmental Impact Report (EIR) for the above-mentioned Project.

Based on the review of the document, DTSC's comments are as follows:

1) The draft EIR needs to provide the site history and past operations of the site. Otherwise, it will be difficult for DTSC to provide adequate comments.

2) The draft EIR needs to identify and determine whether current or historic uses at the Project site have resulted in any release of hazardous wastes/substances at the Project area.

3) The draft EIR needs to identify any known or potentially contaminated site within the proposed Project area. For all identified sites, the draft EIR needs to evaluate whether conditions at the site pose a threat to human health or the environment.

4) The draft draft EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may require remediation, and the government agency to provide appropriate regulatory oversight.

5) If the property had vegetation or agricultural use, onsite soils could contain

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov.

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pesticide residues. The site may have contributed to soil, and groundwater contamination. Proper investigation and remedial actions should be conducted at the site prior to its new development.

6) If any of the adjacent properties are contaminated with hazardous chemicals, and if the proposed project is within 2,000 feet from a contaminated site, then the proposed development may fall under the "Border Zone of a Contaminated Property." Appropriate precautions should be taken prior to construction if the proposed project is on a "Border Zone Property."

7) The project construction may require soil excavation and soil filling in certain areas. Appropriate sampling is required prior to disposal of the excavated soil. If the soil is contaminated, properly dispose of it rather than placing it in another location. Land Disposal Restrictions (LDRs) may be applicable to these soils. Also, if the project is planning to import soil to backfill the areas excavated, proper sampling should be conducted to make sure that the imported soil is free of contamination.

8) If the project requires demolition, renovation and addition of building structures, investigate the presence of lead paints and asbestos containing materials (ACMs) in the currently existing buildings at the site. If the presence of lead or ACMs are suspected, proper precautions should be taken during demolition activities. Additionally, the contaminants should be remediated in compliance with the California environmental regulations.

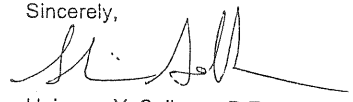
9) If during construction the project, soil and/or groundwater contamination are suspected, construction in the area should cease and appropriate Health and Safety procedures should be implemented. If it is determined that contaminated soil and/or groundwater exist, the draft EIR should identify how any required investigation and/or remediation will be conducted, and the government agency to provide appropriate regulatory oversight.

DTSC provides guidance for the Preliminary Endangerment Assessment (PEA) preparation and cleanup oversight through the Voluntary Cleanup Program (VCP). Also, DTSC is administering the $85 million Cleanup Loans and Environmental Assistance to Neighborhoods (CLEAN) program, which provides low-interest loans to investigate and clean up hazardous materials at properties where redevelopment is likely to have a beneficial impact to a community. The CLEAN program consists of two main components: low interest loans of up to $100,000 to conduct PEAs of underutilized properties; and loans of up to 2.5 million for the cleanup or removal of

hazardous materials also at underutilized urban properties. These loans are available to developers, businesses, schools, and local governments.

For additional information on the VCP or CLEAN program, please visit DTSC's web site at www.dtsc.ca.gov. If you would like to meet/discuss this matter further, please contact Mr. Johnson P. Abraham, Project Manager at (714) 484-5476.

Sincerely,



Haissam Y. Salloum, P.E.
Unit Chief
Southern California Cleanup Operations Branch
Cypress Office

Enclosure

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044

Mr. Guenther W. Moskat, Chief
Planning and Environmental Analysis Section
CEQA Tracking Center
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806

3-12-02

RECEIVED

County of San Bernardino
Advanced Planning Dept.
385 N. Arrowhead Ave (third floor)
San Bernardino, CA 92415-0182

attent: Tracy Creason, Senior Associate Planner

Re: Environmental Impact Report (EIR) for Moon Camp II # 16136

I'm writing to express my very deep concern regarding the "Moon Camp" & "Cluster Pines" developments in Fawnskin.

I have lived here for seven (7) years now & have enjoyed Big Bear Valley so very much for all the wonderful outdoor activities it has to offer & as I have lived in LA area most of my life with the smog - I feel I now live in paradise - clean air, beautiful trees & a mountain atmosphere & small town as well - what more could I want.

It has my home on the North Shore for over 6½ years & frequent Fawnskin almost daily.

The charm of this little community and the people I have met over the years is utterly delightful.

I'm very concerned of large growth & what it could do to the area & our lake - increased traffic, congestion additional emissions fire places, stoves, boats. — etc. water quality from run off to the lake from construction & population.

Let alone our many drought years we have with very limited resources.

I'm totally against removal of our 730 trees just to move the highway. & how about our wildlife? - so precious to so many people including myself.

If there is to be development - I suggest it to be on a smaller scale & keep our little town of Fawnskin unique & nature-oriented as it always been.

Most sincerely,

Darleen "Dana" Craig

mailing address:
P.O. Box 293
Big Bear Lake, CA 92315

actual address:
1112 Mt Whitney
Big Bear City
(North Shore)

SUPREME WELDING & METAL PRODUCTS
197 PECKHAM ROAD • AZUSA, CALIFORNIA 91702

COUNTY OF SAN BERNARDINO
ADVANCED PLANNING DIVISION
385 N. ARROWHEAD AVE. THIRD FLOOR
SAN BERNARDINO, CA 92415-0192

ATTN: Tracy Creason, Senior Associate Planner

92415+0192

RECEIVED
MAR 19 2002

COMMENTS ON: SAN BERNARDINO COUNTY LAND USE SERVICES
DEPARTMENT/PLANNING DIVISION PROJECT NOTICE,
PARTS A & B,
FILE/INDX: GPA/TT/M331-8N/01/APN:0304-091-12*

From: A.M. Chaffee, P.O. Box 14, Fawnskin, California, 92333

This plan will endanger the delicate environment of the entire Big Bear Valley, not just the Fawnskin area.

The development will be a traffic hazard from Stanfield Cutoff to the dam, and will cause air, water, and ground pollution.

The estimated number of trees slated to be removed is sickening.

Smoke from household fireplaces and stoves will hang like a dirty cloud over Fawnskin, the North Shore, and the east valley during the winter months, further poisoning the air.

The eagles will lose their habitat, as will countless other wildlife that we love, and that make the area what it is--beautiful and rural!

And what about the people who came and stayed in Fawnskin to enjoy the quiet and beauty of a small community, one which is now threatened by pollution, traffic, noise, and destruction caused by a cracker-box development.

The only persons or companies that will benefit from this mess are the realtors and their backers.

Another small item--what about the "water shortage"? How does that fit into the plan--new wells into the same aquifer? That will really do it!

A. M. Chaffee

Ann Marie Chaffee
39688 Flicker Rd
PO Box 14
Fawnskin CA 92333-0014

UNITED WE STAND

92415/0182

Tracy Creason,
Senior Associate Planner
385 No. Arrowhead Ave.
San Bernardino, CA
92415-0182

DAVID AND SUSAN CROCKETT
P.O. BOX 236
FAWNSKIN, CA 92333-0236

March 12, 2001

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave
San Bernardino, CA 92415-0182

Attention: Tracy Creason
Senior Associate Planner

Re: Environmental Impact Report (EIR) for Moon Camp TT#16136

Dear Ms. Creason,

We have *many* concerns relative to the impact of the proposed development and the cumulative effect of development of other large parcels on the North Shore of Big Bear Lake, specifically the Fawnskin area.

We will narrow the scope of our letter to Quality of life issues which to us also include Environmental issues.

Like so many, we were attracted to this area because it is more pristine, less developed and more rural. We are deeply concerned that the same standards of city, urban or suburban will be applied to this forested mountain area where the comparisons are in no way similar.

The removal of 700 plus trees for the new highway alone does not take into account the number of trees that will be removed for building or that may die due to construction impacting the earth. Some of these trees are very old. Older in fact than they may look. Because this area gets very little moisture, the ecosystem is more fragile than you might be aware. Therefore it takes along time for things to grow to any great height. Some of the trees under consideration for removal are probably more than 200 years old. These older trees with "snags" are favorite eagle perches. They can not be replaced by mitigating tree replacement. The entire nature of the area will change by the removal of this number of trees.

Also no longer will it be a "scenic highway" because the road will be moved away from the scenery, the lake and obscured by houses. Public access to this extremely lovely area will be block by the proposed gated community.

Concerning traffic studies: During major holidays, the traffic on North Shore Drive is quite congested. It is extremely difficult to make left hand turns from Standfield cut off to North Shore. Traffic through Fawnskin is heavy enough that it is hard and unsafe when trying to cross the street in town. Also, coming down from the mountain and trying to turn left onto North Shore from Canyon or Garden or any of those streets is difficult as it is. It will only become more congested. How will this be mitigated? Since the new highway will be up to county standards - which we guess means straighter and wider which translates to faster traffic speeds- what happens when it narrows down to the old highway? Will a stop sign be needed at Canyon so that accidents do not occur from higher speed vehicles and slow speed vehicles pulling out and left onto North Shore?

The additional traffic and trucks (from construction) plus additional emissions from fireplaces will add to the inversion layer. Since we live on Piney Ridge, a knoll above the lake, we see this layer of smog occasionally as it now. This pollution/ air quality issue is of grave concern to us.

The lake is currently undergoing or soon will be studies concerning the quality of water the various elements, pollutants etc (we are not chemists) as required by new laws. Since this information is not currently known, to our understanding, isn't it premature to make decisions about the lake and how the proposed development and others will affect the lake? How will run off absolutely be kept from affecting the lake? This is not possible. Look at Lake Tahoe in Northern California which has serious run off issues. Big Bear is smaller but the issues are the same.

Part of the joy of living in this area and up on a scenic knoll, is being able to see the stars, clearly. Something that is not possible in an urban or suburban setting. We are concerned that the addition of 92 homes and their attendant glare will change the clarity and obscure the stars. It will be unrecoverable.

One last concern: To us it seems unbelievable that the zoning can be changed from one or two houses to ninety-two (92). In the city, in an urban or suburban setting, maybe so, but here? It makes no sense to us.

Once this fragile ecosystem is gone and the proposed development and others added, the area of Fawnskin will not resemble the pristine, forested, mountainous area that it currently is.

Thank you for your consideration.

Sincerely,
D & S Crockett
The Crocketts

RECEIVED
MAR 13 2002

To: County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave.
San Bernardino, CA 92415-0182

From: Dean & Mary Jane Strenger
1022 Grey Back Trail
Fawnskin, CA 92333

Mailing address:
12811 Hickory Branch Road
Santa Ana, CA 92707-3426

Re: EIR for Moon Camp TT #16136

Attention: Tracy Creason, Senior Associate Planner

You will receive many letters that highlight the environmental problems with the development of the Moon Camp properties. The problems are real and should cause any county official some real concerns. To devaluate property of those who have followed the law and also the intent of the law in order to provide great profits for those who disregard the rights of others is simply wrong. But, it is not the greatest wrong.

As you drive East out of Fawnskin, there is a peacefulness when you view the beautiful lake and the subtle colors caused by the reflections of the mountains of the south shore. This is what was intended when the original parameters were set for the development of the North Shore. If officials of the County of San Bernardino approve plans that would take away for all time the opportunity for future generations to feel the power of Big Bear Lake from this perspective, a crime against nature will have been committed. Please do not let this happen.

It is critical that the lake shoreline be protected for future generations. The development of Moon Camp as proposed would violate the trust placed in you as county officials responsible for providing the safeguards for the maintenance of the public trust.

I trust that you will not let this happen.

Dean R. Strenger

Mary Jane Strenger

March 13, 2002

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave. Third Floor
San Bernardino, ca 92415-0182

RECEIVED
MAR 19 2002

Attn: Tracey Creason, Senior Associate Planner

Project: Environmental Impact Report (EIR) for Moon Camp TT #16136
Donald & Jeannie Wheeler Jr.
39625 Flicker Rd.
Fawnskin, ca 92333

I am writing in concern about the development of Moon Camp in Fawnskin. Here are a few on my concerns over the issue:

The preservation of our trees is very important to our wildlife. Removing any more trees would greatly jeopardize the Bald Eagle, which is already on the endangered species list. There is also the blue herons, ospreys, hawks and waterfowl that are in danger. The deer and coyote also access lakeshore through property.

There is also the safety issue of straightening SR38. When you have a longer stretch of roadway people tend to go a little faster. This increases the danger to pedestrians and school bus crossings in the downtown Fawnskin area where crossing in necessary. The roads around this area are not made for speed. You put straight stretches of roads at high speeds and slow turns together you get high speed accidents.

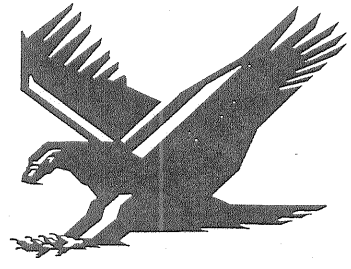
Currently the traffic flow is manageable . When you add many more cars to the roadway as this plan almost requires with the amount of housing being considered would only cause confusion to the roadway. The confusion of traffic cannot relief itself, because there is no other alternative roadway to use in Fawnskin.

My last concern is that I really enjoy taking in the scenery around the lake area, whether it's walking or driving. The north shore has a serene ambiance, frequently characterized as quiet, natural, uncongested and lake-accessible. With this project at hand you not only take away the beautiful view of the lake for many of the residencies and visitors to the area but at the same time the project would be destroying the plants and wild life that live here. Proposed development would change the mountain character of the north shore from "country" living to "city" setting. We would also lose public access to the lakeshore, as development would be a private, gated community.

I am asking you to please take these issues to heart. Fawnskin, Big Bear Lake is a beautiful place to live. Please don't take that away from me and my family. Thank you.

Sincerely,

Donald L. Wheeler Jr.
Jeannie M. Wheeler
Fawnskin



Gary M. Raskin
1725 Hillside Drive
Glendale, CA 91208
818/291-9714

RECEIVED
MAR 19 2002

Local Address:
1284 Ridge Road
Fawnskin, CA 92333

March 13, 2002

Tracy Creason
Senior Associate Planner
County of San Bernardino
Advance Planning Division
385 No. Arrowhead Ave.
Third Floor
SanBernardino, Ca 92415-0182

Re: Environmental Impact Report (EIR) for Moon Camp TT #16136

I am a part time residence of Fawnskin, CA and I am greatly concerned about the proposed development of the area known as Moon Camp.

Although I would like nothing better than to see the land remain untouched, I understand that the property owners have the right to develop the land as they see fit. However, this should be in accordance with the regulations and uses permitted and controlled by existing zoning.

I purchased my home in Fawnskin subject to the existing rules and zoning requirements and made this decision on the premise that such rules and controls would remain in effect and thus my family and I could enjoy the existing environment for many years to come. If any variances or rezoning is allowed on the Moon Camp property, I would perceive this to be an affront to all existing property owners and the general public. If approved, I too would expect that you could rezone my area and move a road so that I could have lake front property too!

In addition to the unfairness that would result from the ability of the developers to get variances and rezoning changes, I am concerned that such a large development would have an adverse impact on the local utilities, water resources and most importantly, the natural habitat and wild life.

Sincerely,

Gary M. Raskin

STATE OF CALIFORNIA — Gray Davis, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
(916) 657-5390 - Fax

March 13, 2002

Tracy Creason
San Bernardino County Land Use Services Department
385 N. Arrowhead Ave., 3rd Floor
San Bernardino, CA 92415-0182

RECEIVED
MAR 19 2002

RE: SCH# 2002021105 – Moon Camp

Dear Ms. Creason:

The Native American Heritage Commission has reviewed the above mentioned NOP. To adequately assess and mitigate project-related impacts on archaeological resources, the Commission recommends the following actions be required:

- ✓ Contact the appropriate Information Center for a record search. The record search will determine:
  - If a part or all of the area of project effect (APE) has been previously surveyed for cultural resources.
  - If any known cultural resources have already been recorded on or adjacent to the APE.
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - If a survey is required to determine whether previously unrecorded cultural resources are present.
- ✓ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  - The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure.
  - The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.
- ✓ Contact the Native American Heritage Commission for:
  - A Sacred Lands File Check.
  - A list of appropriate Native American Contacts for consultation concerning the project site and to assist in the mitigation measures.
- ✓ Lack of surface evidence of archeological resources does not preclude their subsurface existence.
  - Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5 (f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
  - Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.
  - Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code §7050.5, CEQA §15064.5 (e), and Public Resources Code §5097.98 mandates the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Sincerely,

Rob Wood
Environmental Specialist III
(916) 653-4040

CC: State Clearinghouse

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MAR 19 2002
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

RECEIVED
MAR 19 2002

March 14, 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Avenue
Third Floor
San Bernardino, CA 92415-0182

Reference: Environmental Impact Report (EIR) for Moon Camp TT #16136

The proposed development of Moon Camp is a not a good thing. Disruption of the many established natural ecosystems that area should not be allowed. A simple look at the south shore activities on any weekend should be enough of an indicator of the impact people and 'progress' have made on the area for any rational individual to conclude that zoning changes and construction of any magnitude would leave irreparable damage to an already fragile area like the town of Fawnskin on the north shore of Big Bear Lake.

Moon Camp would not only impact the forest, wildlife and lake but the many eagles that migrate annually to that very area. Further, the pollution from people (lights, sewage, traffic, smog, congestion and noise) would certainly have a negative effect on the environment.

Additionally, it is a fact that existing hotels and rental properties and tourist industries (shops, stores, restaurants etc.) local to the area far exceed the demand. There is no need for more building. Enough damage has already heaped on the local environment; lets not add any further burden to the already fragile area.

Please use not only the laws and ordinances that are specific to your investigation, use your eyes, ears and mind to evaluate the situation that already exists on the south side of Big Bear Lake and ask yourself if you really want this to happen to yet another area of the valley, an area your children and their children may someday want to visit and enjoy.

Pages 2 & 3 attached to this letter further detail our specific concerns.

Respectfully,

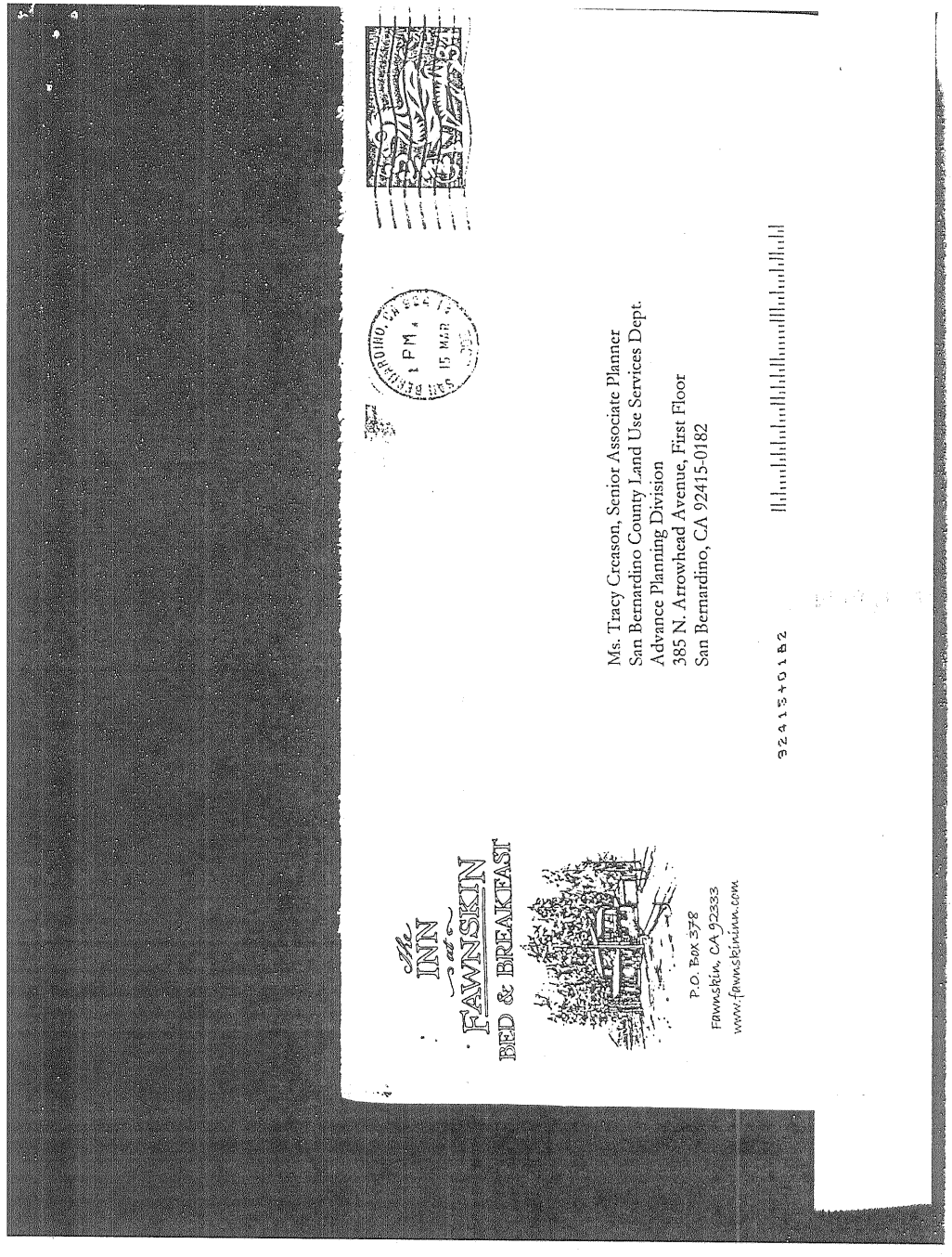
Dan + Jana Fowlks

Dan and Jana Fowlks
P.O. Box 64
Fawnskin, California 92333

Issues List Concerning Developing Moon Camp

- Air Quality
  There will be increased auto emissions due to increased number of cars and slower speeds caused by increased traffic congestion, increased emissions from fireplaces and wood burning stoves, as well as boat engines, ATV's, leaf blowers, and recreational vehicles, and cumulative air pollution from this and all projects around the valley, including during construction phase.
- Water Quality
  There will be additional runoff to the lake which is already saturated with fertilizer, etc. from runoff in existing landscaping and development areas elsewhere.
- Water availability (especially in drought times, which are a natural part of our climate cycle)
  There is currently a shortage of water and we are in drought conditions. In the late 80's and early 90's people were without water on major holidays in the summer and pressure was reduced on streets at higher elevations. A fire would have caused disaster. There is no more water in the valley now and 92 homes will certainly intensify the situation.
- Energy Factors
  Local electricity providers claim no more power lines can be added nor can solar power be used and that the valley is already short of the electricity it needs. Continuous building elsewhere in the valley, as well as this project, will continue to exacerbate the problem plus increase the chances of blackouts, etc.
- Sewer Capacity
  The manholes in the streets repaved during 2000 and 2001 have not been raised and if there are any problems, these manholes will have to be located and jackhammered out before anything can be done. Are the pipes in Fawnskin of sufficient capacity to handle additional homes? Cumulative sewer effects with all the developments proposed and in progress must be addressed. There are already sewer odors in some homes due to being overloaded and nothing has been done with these.
- Tree Removal
  The development expects the removal of 730 trees (25% of existing trees), which only addresses those to be removed to reroute the highway. How many additional trees will be removed to build homes? Plus how many will die due to stress of construction. The large, old growth trees removed will not grow back in our lifetime, so planting lots of replacement trees is not sufficient mitigation.
- Eagle Habitat
  Eagles use many of the trees throughout the entire Moon Camp area, not just a few trees along the shoreline. The whole Moon Camp area is eagle habitat. Eagle perch trees take hundreds of years to grow, saving a few existing trees will not provide habitat into the future.
- Wildlife Habitat
  This area is also habitat for blue herons, ospreys, hawks and waterfowl. Wildlife (deer, coyote) access lakeshore through property.
- Plant Habitat – This will destroy endangered/threatened habitat areas (pebble plains, wetlands) known only in Big Bear, as well as endangered/threatened flora in the area.
- Light Pollution/Glare – Additional lighting from 92 homes would greatly diminish the intensity of the nighttime sky.
- Medical Services – We have limited medical facilities, including ambulance service, inadequate for increased population.

- Fire Protection – The Fawnskin Fire Department is very small, inadequate for planned development.
- Time frame for Biological Assessment (are survey windows adequate/appropriate) – Due to seasonal changes in animal migration and living patterns, anything short of a one-year study will not fully assess the impact on animal life.
- Traffic Study –Traffic would increase dramatically with addition of Moon Camp, Cluster Pines, Brookside Road and the new Zoo. Holiday traffic is currently unacceptable in the valley. Weekend and vacation use/rental impact on traffic and parking should be addressed; multiple cars per house/unit. What are the cumulative effects of increased traffic in the town of Fawnskin, as well as Stanfield Cut Off and the south shore communities?
- Public Safety – Additional traffic increases danger to pedestrians and school bus stop/crossings in the downtown Fawnskin area where crossing the highway is necessary.
- Public access - Public access to the lakeshore would no longer exist, as development would be a private, gated community.
- Designated Scenic Highway – The scenic value of the highway would be removed since views from the highway would be obstructed by multiple home construction.
- School System - How will this impact the limited classroom capacity?
- Seismic Activity - A fault runs through Windy Point. Is there an issue with regard to earthquakes and the "seismic effect", as well as for the emergency personnel and equipment available in such an instance?
- Property Values - What impact will "high density" housing development have on property values near the property, as well as throughout Fawnskin?
- Noise - Localized effects (construction and long term) and cumulative effects (sound travels across lake)
- Lake Usage – Increase watercraft on lake due to 100-slip private marina. Additional watercraft also causes further lake pollution.
- Quality of Life –Fawnskin and the north shore have a serene ambiance, frequently characterized as quiet, natural, uncongested and lake-accessible. Proposed development would change the mountain character of the north shore from "country" living to "city" setting.
- City standards non applicable here
  "City" development standards should not be applied to Fawnskin. Impact comparisons should not be made with an urban area.
- Impact to South Shore and North Shore Communities – Loss of revenue to lodge owners and marina boat rentals. Impact of additional traffic, noise, etc. on the already overburdened South Shore communities.
- County Services – What impact on fire, sheriff, and sewer services?
- Environmental Terms & Conditions – County has a very bad record for not enforcing mitigation terms and conditions presently. Would there be any change?
- Developer's Track Record – The developer has a bad track record regarding adhering to mitigation terms and protecting areas developed. How would that be mitigated.
- Alternative Usage – Explore the potential to expand the National Forest lands as an alternative to proposed rezoning.
- Cumulative Effects – Increasing the population increases all the effects (the multiplier factor). The cumulative effect of developments at Moon Camp, Cluster Pines, Brookside Road, Deer Trail and the new zoo with the existing environment must be assessed collectively with regard to all issues. City development standards should not be applied. Mitigation should be site-specific to Fawnskin, not based on a model.



The INN at FAWNSKIN
BED & BREAKFAST

RECEIVED
MAR 19 2002

March 14, 2002

Ms. Tracy Creason, Senior Associate Planner
San Bernardino County Land Use Services Dept.
Advance Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Re: "Notice of Preparation of Environmental Impact Report for RCK Properties, Inc. Proposed Project, Tentative Tract No. 16136", Fawnskin
FILE/INDX number: GPA/TT/M331-8N/01/APN: 0304-091-12

Dear Ms. Creason:

We would like the following issues to be addressed in the Draft EIR for the above referenced project:

1) **Increases in the noise levels for existing properties north of highway should be analyzed.** Realigning North Shore Drive (Highway 38) to provide the ability for more lakefront residences makes no sense when now anyone traveling the highway has good lake views for a mile or so.
2) **A thorough analyses of all wildlife should be included in the Draft EIR.** This should include the endangered bald eagles that winter on the property, as well as waterfowl and other birds, and several endangered plants.
3) **The stress load on our sewage system should be analyzed.**
4) **Short and long-term increases in traffic congestion and accidents along North Shore Drive should be fully analyzed in the Draft EIR.** We feel that traffic would increase to unacceptable levels along North Shore Drive if this project is completed.
5) **The EIR should include an analysis of both direct emissions and secondary air pollutants of the proposed project, and their effect on the air quality of Fawnskin, and the entire Big Bear Valley.**

In summary, we are against changing the current zoning or realigning the highway just so developers can increases their "bottom line" at the expense of the current owners in Fawnskin, and those who vacation here on the North Shore, specifically because it provides a pristine, quiet experience. The above issues must be addressed in the EIR. We would also like to add that any General Plan Amendment for lakefront property should include a continuation of the popular **Alpine Pedal Path.**

Very truly yours,

Nancy Hazewinkel & Wm C. Hazewinkel

William & Nancy Hazewinkel

880 CANYON ROAD ~ POST OFFICE BOX 378 ~ FAWNSKIN, CA 92333 ~ (909) 866-3200
www.fawnskininn.com ~ fawnskininn@earthlink.net

Tracy Creason, Senior Associate Planner
San Bernardino County Land Use Services Department
Advance Planning Division
385 North Arrowhead Avenue, 3rd Floor
San Bernardino CA. 92415-0182

RECEIVED
MAR 19 2002

March 14, 2002

To: Tracy Creason, Senior Associate Planner

RE: NOTICE OF PREPARATION OF ENVIRONMENTAL IMPACT REPORT FOR RCK PROPERTIES, INC. APPLICATION FOR TENTATIVE TRACT MAP 16136, A GENERAL PLAN AMENDMENT/OFFICIAL LAND USE DISTRICT CHANGE, AND A CONDITIONAL USE PERMIT ON APPROXIMATELY 62 ACRES LOCATED IN THE UNINCORPORATED COMMUNITY OF FAWNSKIN

FILE/INDX: GPA/TT/M331-8N/01/APN:0304-091-12*

PURPOSE: The purpose of this letter is to provide environmental information and questions (listed below) that we feel should be addressed, analyzed in detail, quantified wherever possible and disclosed in a detailed format in the Environmental Impact Report regarding Tract Map 16136 (proposed Project).

OPPOSE: Oppose to almost doubling the City of Fawnskin's current population from 380/400 people to a Project build out population of 748/768 (estimate 92 houses at 4.0 persons per household equals an additional 368 people, assuming no additional subdivisions). Such a huge, concentrated and significant increase infringes upon the concept of the "greatest good for greatest number" which includes the needs of the environment, wildlife that it supports, protection of waterways and a social/cultural way of life in this area.

ENVIRONMENTAL INFORMATION AND QUESTIONS:

Land Use

What is the logic or rational to propose a land use change from Rural Living (RL-40), i.e. a 40 acre lot to Residential with a 7,200 Sq. ft. lot size? This is the size of lots in urban areas. This would constitute incompatible land use and will significantly alter the character of the surrounding area. What is the proposed use for the "major variance" to allow 2 lots to exceed the length and width ratio?
How is the proposed Project consistent with local/regional land use/growth projections?

Biological Resources

Trees will be destroyed by the proposed Project, how will this affect the eagle habitat or affect feeding areas of the eagles or other wildlife near the Big Bear Lake (Lake)?

To what extent will endangered flora or fauna be jeopardized or destroyed and what effect will this have on the eagle habitat?

How much of the eagle winter habitat in the immediate and surrounding area will be affected by noise and light?

Air Quality

How much additional chimney smoke will be created and added to the existing inversion layer, thereby creating additional pollution in the Fawnskin area?

Noise/Light

What will be the increase in light pollution (brightness) in the area with the addition of 92 houses and associated utilities and the increased noise (measured in decibel levels)? What will be the increase of additional traffic noise due to cars/trucks/buses in the Fawnskin area? Also what will be the increase of additional boat noise and light due to marina activities?

Transportation/Traffic

By realigning North Shore Drive, what will be the increased number of trips per day between Canyon Road and the City of Fawnskin (center) and between Canyon Road and North Shore Elementary School? What effect will these increased trips have on a very curvy (10 mph in some cases) road between Canyon Rd. and the center? When heading west on North Shore Drive, at Captain John's Marina (Dana Point recreational area), a complete stop is needed in the middle of a blind curve to turn left into Captain John's Marina. This is an extremely dangerous approach to Captain John's.

Traffic from the proposed Project will be in addition to any increased traffic created from the proposed zoo to be situated also on North Shore Drive near the Discovery Center.

Increased traffic noise will have an negative effect on the City of Fawnskin's quiet community, environment, and culture.

Aesthetics -- Recreation

The public now has viewing access from the existing open property. How many acres of public viewing (existing natural condition) will be eliminated as a person looks toward the Lake after the proposed Project is completed? Also, how much shoreline, will be eliminate for potential public access and use for recreational purposes? Recreational use adjacent (north) of existing North Shore Drive will also be lost. This constitutes potentially significant impacts to aesthetics and irreparable loss to use this area as a recreational resources.

Why would this area not be held or used as a controlled public resource to preserve the natural habitat and rural landscaping and aesthetics?

The proposed Project will have a significant negative impact on the environment and the character of this unique community.

To what extent will the amount and size of homes at build-out, change the landscape and the mountain character of Fawnskin?

Hydrology/Water Quality

Answers to all hydrology/water quality questions, will aid in analysis of the potential effect the proposed Project could have on future groundwater supplies.

If this basin has not been adjudicated, is there a water management plan for Big Bear Valley considering a short term plan (1-5 yr.) and long term plan (5-20), including Fawnskin? What organization is responsible for administering such a plan? What are the water supply and demands based on increased population growth for the next 20 years? Does the water management plan consider almost doubling Fawnskin's population due to this proposed Project? If not why? Or is there a Master Land Use Plan that considered almost doubling population due to this proposed Project?

What are the current water policy issues and procedures regarding: population growth, endangered species consideration, developing new water supplies, regional water supply shortages (cities surrounding the Lake) and water use efficiencies (water conservation and recycled water use)?

In acre-feet (AF), what is the operational physical capacity of the groundwater basin, maximum capacity of the basin and, current capacity? What is the all time low capacity? What is the safe-yield of the groundwater basin?

How many groundwater wells usually supply Fawnskin? How many total groundwater wells are available in the groundwater basin? What is the depth of the bowls? Have any public wells ever gone dry, if yes when. Have any private wells gone dry, if yes when? Has the water quality been affected as water levels drop and to what extent? What additional impact to existing wells would result if the proposed Project were implemented? What protections are offered if local wells run dry due to additional water being provided by the proposed Project?

How would this proposed Project impact water supplies during a future 3-4 year drought or one of lesser duration. How will groundwater levels be lowered with the addition of the proposed Project and what will be the effect on wells in the Fawnskin area?

Is there a gap between groundwater basins that would allow groundwater to flow from one or to the other groundwater basin? If so at what groundwater elevation would such a flow begin? How would proposed Project affect groundwater levels and flow patterns?

Are there groundwater models currently being used to support or aid in analysis of groundwater water inflows and outflows in the area? If not why?

How will water demands meet daily, weekly, monthly, or annual peak deliveries with the proposed Project completion? What effect will this have on local water supplies during peak time usage? How will the proposed Project affect operations of peak supplies?

What is the mass balance of the groundwater basin and the watershed which would include analysis of data for historical inflows and outflows, groundwater yields, operations of the basin, safe yields etc? What are current groundwater levels in the groundwater basin and surrounding basins, and to what extent would the proposed Project (at build out) have on groundwater levels?

What are the short term and long term water demands for the City of Fawnskin including the proposed Project at full build out?

Lake Impacts

On a short term basis (0-5 years) or long term (5-20 years) planning process, how will the proposed Project affect or impact Lake water resources management, resources (density of boats etc. on Lake), water quality, erosion and (runoff into the Lake), total maximum daily load capacity and, aesthetics.

Are there any springs that feed the Lake and if there are how many acre-feet or gallons per minute feed into the lake due to these springs? How would these flows be affected by the proposed Project if additional water usage lowered groundwater levels? Would springs be affected?

If proposed Project is approved, based on population/water demand projections, will it be necessary to treat Lake water to be used as a source of municipal and domestic supply in the Big Bear Valley? This would also be a concern as population increases.

Utilities/Service System

What is the capacity of the current sewage system and how much will the sewage flows increase during hourly, daily, monthly or annual peak hours with the proposed Project?

Does the existing water treatment plant have the capacity to treat additional sewage? How much additional sewage will be produced by build out of this proposed Project? What happens in the case of an outage with possible flow to the Lake?

What additional public services and utilities would be necessary to support almost doubling the population of Fawnskin and what increases in costs such as: taxes, user fees, loans, grants etc., would be needed to provide these services.

Other Concerns

The EIR needs to include an alternative that is consistent with the existing plan and zoning designations.

Does the proposed Program need approval from the California Department of Fish and Game, U. S Fish and Wild Live Service, Regional Water Control Board, U.S. Army Corps of Engineers? We request that the county obtain written concurrence from these agencies on the extent of impacts and appropriate investigations prior to proposed Project approval.

We are requesting a copy of the EIR and notification of all subsequent actions on this proposed Project to be mailed to:

John/June Ivascyn
17114 Stare Street
Northridge, CA. 91325

Sincerely

John P. Ivascyn June Ivascyn

cc: Friends of Fawnskin

March 14, 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave., 3rd floor
San Bernardino, CA 92415-0182
Attention: Tracy Creason, Sr. Associate Planner

RECEIVED
MAR 19 2002

RE: EIR for Moon Camp TT #16136

Dear Ms. Creason,

This letter is to express concern about the proposed Moon Camp development in Fawnskin, Big Bear Lake. I oppose the changing of the zoning and fear the impact it will have on our community. Because of the incredible density they seek I fear it will increase highway traffic, necessitate changing the scenic road, hurt the drinking water situation, and overcrowd the lake. I think it will have a negative effect on our resort community.

It is a dense, city-like project that has no place in the scenic spot they propose. The zoning laws are in place to protect from such development and the owners knew the zoning laws when the purchased it. While I do support a property owners right to choose, within reason, what to do with their property, I do not support those who purchase property and then seek to drastically change the existing zoning laws.

Please help us preserve this little bit of paradise by allowing them to develop only what the zoning laws allow – that is one home for 40 acres and no street bypass or huge marina.

Thank you for your consideration,

Joanne Salzer
Full time resident
P.O. Box 15
Big Bear Lake, CA 92315

March 14, 2002

RECEIVED
MAR 20 2002

Ms. Tracy Creason, Senior Associate Planner
San Bernardino County Land Use Services Dept.
Advance Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Re: "Notice of Preparation of Environmental Impact Report for RCK Properties, Inc. Proposed Project, Tentative Tract No. 16136", Fawnskin
FILE/INDX number: GPA/TT/M331-8N/01/APN: 0304-091-12

Dear Ms. Creason:

We would like the following issues to be addressed in the Draft EIR for the above referenced project:

1) **Increases in the noise levels for existing properties north of highway should be analyzed.** Realigning North Shore Drive (Highway 38) to provide the ability for more lakefront residences makes no sense when now anyone traveling the highway has good lake views for a mile or so.
2) **A thorough analyses of all wildlife should be included in the Draft EIR.** This should include the endangered bald eagles that winter on the property, as well as waterfowl and other birds, and several endangered plants.
3) **The stress load on our sewage system should be analyzed.**
4) **Short and long-term increases in traffic congestion and accidents along North Shore Drive should be fully analyzed in the Draft EIR.** We feel that traffic would increase to unacceptable levels along North Shore Drive if this project is completed.
5) **The EIR should include an analysis of both direct emissions and secondary air pollutants of the proposed project, and their effect on the air quality of Fawnskin, and the entire Big Bear Valley.**

In summary, we are against changing the current zoning or realigning the highway just so developers can increases their "bottom line" at the expense of the current owners in Fawnskin, and those who vacation here on the North Shore, specifically because it provides a pristine, quiet experience. The above issues must be addressed in the EIR. We would also like to add that any General Plan Amendment for lakefront property should include a continuation of the popular **Alpine Pedal Path.**

Very truly yours,

Carla + Roger Willson

Carla & Roger Willson
6949-A Doheny Place
Alta Loma, CA 91701
P.S. We are frequent vacationers in Fawnskin and love the place the way it is. It's so peacful.

POLIQUE CANYON ASSOCIATION
Twenty-two cabin Owners
P.O. Box 47
Fawnskin, Calif. 92333

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MAR 19 2002

March 14, 2002

County of San Bernardino
PUBLIC SERVICES GROUP
Land Use Services Dept./PEMS
385 North Arrowhead Avenue, 3rd. Floor
San Bernardino, Calif. 92415-0182

To: Tracy Creason – Senior Associate Planner

Response to Tenative Tract Proposal #16136

Objectives:

-Futhur exploitation by a developer of the beauty of the Big Bear Valley, especially on Lake Front Property. THIS WILL BE THE FIRST ONE ON THE NORTH SHORE.

-Extreme noise and light pollution with the quantity of homes proposed for the Fawnskin area.

-Potential lowering of the Water Table in the Fawnskin area which would put extreme hardship on the current property owners with additional new deeper wells having to be drilled and those owners having too bear that expense. This comes in a year of extreme drought where the water tables are already at their lowest level in many years.

-The Fire Fighting capability in the area would be severely reduced with the lowering of the Water Table.

-Public use of the lakeshore severely reduced with the quantity and scope of new homes proposed.

-Elimination of annual events that now use the area, i.e. Hobie Cat Sailing Clubs, etc.

-Severe disturbance to established fish feeding grounds located in the area of proposed 110 slip Marina as part of the project.

-Density of the lot size out of character with everything else in the area taking away from natural esthetics that were established over 100 years ago.

-Air Quality/pollution of surrounding area would have a serious impact with Winter-Time Smoke from 90 plus homes.

-Water and sewage facilities in the area are currently at capacity and could not withstand the load of this many residences. You would be sacrificing fire fighting and existing capacity of the sewer system.

-Elimination of 750 trees in the area would severely change the traditional landscape of the are and destroy it's original natural beauty. Endangered Flora and Fauna would completely be disregarded in the project area.

-Increase in Traffic Noise and Pollution in the Fawnskin area would severely take away from the natural and established serenity that the area offers.

-ALL of the North Shore needs to remain a haven away from the urban encroachment that has spoiled most of South Shore Big Bear.

-An important and recognized Eagle Habitat will be destroyed and will be inconsistent with the State and Federal Laws that now protect them.

-Additional Auto/Truck trips per day on North Shore Drive would increase by over 900/Day, severely choking this scenic artery around the Lake.

REQUEST

-Existing Zoning to remain the same with the area maintained as a controlled public use area and to preserve the existing natural habitat of the area.

Sincerely, POLIQUE CANYON ASSOCIATION

RECEIVED
MAR 2 0 2002

March 14, 2002

Ms. Tracy Creason, Senior Associate Planner
San Bernardino County Land Use Services Dept.
Advance Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Re: "Notice of Preparation of Environmental Impact Report for RCK Properties, Inc. Proposed Project, Tentative Tract No. 16136", Fawnskin
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5) **The EIR should include an analysis of both direct emissions and secondary air pollutants of the proposed project, and their effect on the air quality of Fawnskin, and the entire Big Bear Valley.**

In summary, we are against changing the current zoning or realigning the highway just so developers can increases their "bottom line" at the expense of the current owners in Fawnskin, and those who vacation here on the North Shore, specifically because it provides a pristine, quiet experience. The above issues must be addressed in the EIR. We would also like to add that any General Plan Amendment for lakefront property should include a continuation of the popular **Alpine Pedal Path**.

Very truly yours,

Carla Wilson

Carla Wilson
328 Paseo Tesoro
Walnut, CA 91789
P.S. I am often going to Fawnskin because it is so quiet and peaceful.

March 15, 2002

RECEIVED
MAR 1 9 2002

County of San Bernardino,
Advanced Planning Division
385 N. Arrowhead Ave, Third Floor
San Bernardino, CA 92415-0182

ATTN: Tracy Creason, Senior Associate Planner
Re: Moon Camp EIR, TT #16136

Dear Ms. Creason:

The following are some concerns I would like to see addressed in the EIR for the above project:

1. The overall project appears is being promoted with a certain density. However, the project does contain large lots, which could be later be further subdivided. This same developer promoted Eagle Point Estates with a public access corridor to the lake. Later that corridor was gated off. What would ensure that those large lots would not be subdivided in the future?

2. The developer estimates that approximated 730 trees would have to be removed in order to relocate SR38. What will be the effect on the environment with that removal plus whatever trees would be removed for building?

3. As many as eight different tress have been documented as eagle perches. If portions of the North Shore are currently closed to public entry during the eagle season, should Moon Camp be the exception?

4. If mitigation measures are proposed, where would they be, and who would monitor and enforce them? Would they adequately offset the harm done to the Moon Camp area?

5. Would there be adequate consideration given to wildlife corridors?

6. Would measures be taken to either reduce or eliminate altogether light pollution?

7. What effect would the proposed "stacking" of houses along the lake shore have not only upon the scenic view from the highway, but also from the lakeside?

8. The land between the high-water line and the actual lake level is considered to be public property. Where and how would the public gain access to that public area? Who would ensure that such public access, if given, would remain open and not gated off as was done at Eagle Point Estates>

9. Could the increased traffic from the project, along with the increased traffic from other proposed projects in Fawnskin be adequately handled by the road system?

10. Will the EIR consider the air pollution caused by both the increased traffic and the fireplaces from the proposed project as well as from other proposed projects in Fawnskin?

11. How much of the lake area would be withdrawn from public use by the proposed 100-slip marina proposed for the project?

12. Is there sufficient water and sewer capacity to support the proposed project as well as the other proposed projects in Fawnskin?

13. What steps would be taken to maintain the current wildlife habitat?

14. What steps would be taken so as not to do irreparable harm to the current plant habitat?

Robert S. Drake
P.O.Box 164
Fawnskin, CA 92333
(909) 866-2262

Barry and Glenna Morton
PO Box 82, Fawnskin, CA 92333
(909) 866-3978

March 15, 2002

Tracy Creason, Senior Associate Planner
County of San Bernardino, Advance Planning Div.
385 North Arrowhead Avenue - Third Floor
San Bernardino, CA 92415-0182

RECEIVED
MAR 19 2002

RE: Environmental Impact Report (EIR) for Mood Camp TT #16136, in Fawnskin, CA

Dear Ms. Creason:

We're extremely concerned about the proposed RCK development in Fawnskin, which seeks to relocate SR38 East of Canyon Drive, and rezone the property to allow 92 homes to be developed, where current zoning allows one.

The **negative environmental impact** of such a development would be **considerable and irreversible.** Questions of increased congestion, traffic, noise, potential runoff and groundwater problems, water quality concerns, and lost animal habitat, face off with the equally important considerations of the public enjoyment of this area and loss of scenic vistas to all visitors.

Since the proposed development **would depreciate the quiet quality of life** on this area of the North Shore of Big Bear Lake, we **strongly oppose** this request and hope you will thoughtfully weigh the negative environmental impact of the items outlined below.

TRAFFIC, CONGESTION, NOISE: The Initial Study Environmental Checklist Form that we reviewed at the Big Bear Library presented a number of areas of impact and concern. It includes a section on current and projected traffic counts compiled by Kunzman Associates, who detail significant **increases in traffic** as a result of RCK's development. Kunzman projects that the traffic along North Shore Drive would **increase by 40%** by 2006, during peak months, if the project were approved, compared with a more modest 15% if the project is not built. **Speed, noise, and safety issues** are all a concern regarding this increased traffic on the quiet North Shore. These issues would **adversely impact** the quality of life and peaceful habitation of every current resident and visitor to this area.

LOSS OF TREES and SCENERY: Equally concerning is that the development will **remove hundreds of beautiful trees from the area,** only to replace them with a gated community of private homes. These trees offer shade and animal habitat and contribute immensely to the **scenic vistas** now available for *everyone* who uses the highway. Once homes are built they would block lake views from the road and alter the look of the highway forever. As it is, the North Shore is one of the few relatively uninterrupted stretches of lake views in the entire Big Bear area.

EAGLE HABITAT LOST FOREVER: Additionally, these trees are located in one of Big Bear's foremost **bald eagle habitat** areas -- a location that **would be permanently marred** by the proposed dense development. We have watched as an eagle enjoyed his lunch on that piece of shoreline at the bend in the road. If RCK's 92 unit housing development were to be approved, that eagle "picnic area" would become a private, gated boat dock for dozens of noisy personal watercraft, and the eagle would most certainly stay away permanently.

A concerted effort could probably develop a more inappropriate use for this small remaining patch of beautiful forest, but we can't imagine what it might be.

Sincerely,

Barry Morton Glenna Morton

cc: Sandy Steers, Friends of Fawnskin

Peter and Diane Boss
P. O. Box 330
39390 Rim of the World Dr.
Fawnskin, California 92333
March 15, 2002

RECEIVED
MAR 1 9 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave. Third Floor
San Bernardino, Ca. 92415-0182

Attention Tracy Creason Senior Associate Planner-

Concerning Project Environmental Impact Report (EIR)
for Moon Camp TT#16136

The purpose of this letter is to make sure the county fully analyzes the Environmental Impact Report concerning Moon Camp.

Moon Camp proposed 92 homes
Cluster Pines 132 Condos

.The issue is this will more than double the existing Fawnskin population. How can this little town keep it's ambiance , charm and peace and quiet?

. How much light pollution and glare will this number of new homes generate? The more lights the nighttime sky then diminishes.

. How crowded and how long will it take to get around the valley with this huge traffic increase? Holiday traffic is currently unacceptable. The impact on traffic and parking should be addressed.

. Lake usage as to how much pollution will be added to the lake with increased boating &100-slip private marina? What run off materials will be entering the lake water from this many additional homes?

. Sewer Capacity- How much additional sewage capacity is too much? Fawnskin pipes and cumulative sewer effects must be address.

. Quality of Life-Fawnskin has a serene ambiance and peaceful quality. Would this flood of housing and additional occupants change that wonderful way of life? Please don't allow it to go from country to city.

There are precious few towns like Fawnskin left. Please protect it from overload in every environmental avenue. We treasure our home please don't let it be ruined.

Sincerely,

Peter and Diane Boss

Deborah Walters
P.O. Box 86
Fawnskin, CA 92333

County of San Bernardino
advance Planning Division
3rd floor
SanBernardino, CA. 92415 - 0182

ATTN: Tracey Creason (Sr Assoc Planner)
RE: MoonCamp TT # 16136

SAN BERNARDINO, CA 924
PM
19 MAR 2002

RECEIVED
MAR 20 2002

March 15, 2002

To: EIR. Advance Planning Division
Mooncamp TT #16136
From: Gary & Deli Walters

Re: Mooncamp / Cluster Pines

Attn: Tracy Creason Sr. Assoc. Planner

This letter is to help bring to your attention the needs and concerns of the residents of Fawnskin, CA. RCK properties is trying to have our rural community rezoned for more homes, our concern is for the quality of life for all people and animals of the town and community. We have Eagles that live on this land proposed for rezoning, we have limited water reserves for our town, trees are needed for the environment they want to cut down how many? 700 plus trees! RCK wants to change the road going into the small town (380 pop.) traffic problems will arise. The lake can't support 2 more marinas and the traffic and use that would bring. Please help our community Save and preserve the quality that the Big Bear Valley community has been fighting for. Land for the Eagles, trees, clean fresh well water, quiet, slower traffic less homes per capita than RCK wants.

Thank you
Deli Walters

TOM DODSON & ASSOCIATES
2150 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92405
TEL (909) 882-3612 • FAX (909) 882-7015
E-MAIL tda@tstonramp.com

March 15, 2002

RECEIVED
MAR 19 2002

Ms. Tracy Creason
San Bernardino County
Land Use Services Department, Planning division
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

Dear Tracy:

Tom Dodson & Associates (TDA) serves as the environmental consultant for the San Bernardino County Local Agency Formation Commission (LAFCO or Commission) which will function as a Responsible Agency for future service contracts associated with development of the area that will be encompassed by Tentative Tract Map 16136, located on the eastern edge of the community of Fawnskin in Big Bear Valley. This is a major project for a community the size of Fawnskin that will require extensive development of a good data base and an evaluation of major changes in one of the last remaining undeveloped areas within the Fawnskin area. I believe that these comments on the Notice of Preparation will assist the County in completing an adequate environmental document. On behalf of the Commission I have reviewed the County's Notice of Preparation (NOP) for the proposed project and have developed some general comments for consideration by the County in preparing the environmental impact report (EIR) for the proposed residential project.

Since LAFCO will serve as a Responsible Agency as defined by the California Environmental Quality Act (CEQA) because of potential future out of service area contracts, it is important that the EIR prepared for this proposed project contain an adequate discussion of all potential environmental impacts so that it can be considered and accepted by the Commission when it considers service contract issues in the future. In this particular case the future capability to serve the area with adequate services and utilities and the impacts from delivery of utilities and services to the project site need to be fully analyzed in the County's proposed EIR. Of particular importance is the evaluation of cumulative impacts on the various public service and utility service systems, particularly given the current constraints for water and electricity resources in Big Bear Valley. Comments on the remaining environmental issues discussed in the NOP follow in the order that they are discussed in an Initial Study Environmental Checklist Form provided in the State CEQA Guidelines.

Project description: The broad outlines of future land uses and potential development are identified. It is suggested that a development scenario be created with the goal of enabling quantitative evaluation of impacts during development as well as forecasting the buildout impacts of the residential tract on the project site.

1. Aesthetics: This site has particularly important scenic views to the south, towards Mt. San Gorgonio. For the aesthetic analysis it is suggested that the City consider providing a visual simulation of those areas where areas within the project area are highly visible and exposed to a large number of viewers from the highway.

2. Agriculture Resources: Concur with the discussion in the NOP. This area contains no significant agricultural resources based on personal observation of the project area.

3. Air Quality: The South Coast Quality Management District is operating under the 1997 Air Quality Management Plan update. I concur with the proposed evaluation of this issue in the EIR.

4. Biological Resources: The project area is located in a significant biological resource area. Recent interactions with the U. S. Fish and Wildlife Service and Department of Fish and Game and the County Museum biologist indicate that any field surveys conducted for listed or sensitive species or sensitive habitat will need to observe special protocols (such as spring surveys). It is recommended that these protocols be determined through consultation with the above parties and the survey protocols be made available to the experts in the field for verification prior to their implementation. It will also be important to identify an appropriate land use interfaces and buffers between areas proposed for development and any critical habitat contained within the planning area.

5. Cultural Resources: A detailed evaluation of these resources as part of the EIR would appear to be appropriate.

6. Geology and Soils: The project area is seismically active and steep slopes occur on the project site that will require special handling during grading to minimize erosion and sedimentation and potential for slope failure. Related geotechnical issues, ground failure liquefaction or other hazards should be fully explored for that portion of the site near the lake shore.

7. Hazards: The proposed project appears to have a potential to expose development to significant accidental releases of hazardous substances being transported along the highway through the project area. This issue will require careful evaluation given the proposed residential uses in proximity to the project site.

8. Hydrology and Water Quality: Hydrology and water quality issues are of concern for the project area, particularly how to manage storm runoff to minimize erosion and sedimentation potential. The project is located in the upper portion of the Santa Ana River Basin, and given new non-point source management requirements, such as the recent Regional Board storm runoff permit requirements, the analysis of water quality impacts, during both construction and occupancy, should be included with appropriate best management practices. Evaluation of the remaining water resource issues in the EIR appears appropriate as defined in the Initial Study.

9. Land Use And Planning: The analysis identified in the Initial Study appears appropriate.

10. Mineral Resources: Concur that this issue is not of concern at this site.

11. Noise: Existing sources of noise are related to traffic generated noise that is likely to be increased as a result of project development. The effect of the transportation corridors and related noise should be included as a topic within the EIR. The goal would be to define the actual limits of significant noise constraints within the project area where sensitive residential uses should not be constructed without adequate noise buffering. I concur with the remainder of the findings in the noise section of the NOP.

12. Population and Housing: Concur with the findings in the NOP. Anticipated growth inducement from the project's General Plan Amendment needs to be addressed at this stage of review because the project represents an extension of more intense urban development in the Fawnskin area.

13. Public Services: Concur with the findings in the NOP.

14. Recreation: Concur with the findings in the NOP.

15. Utilities and Service Systems: Particularly from a LAFCO perspective, the required water and wastewater system infrastructure required to provide adequate service to this area requires a thorough evaluation, on a project specific and cumulative impact basis.

16. Transportation/Circulation: Concur with the recommended issues for evaluation identified in the NOP. In particular potential conflicts on the highway due to direct access to the highway from the residential areas needs to be examined.

I anticipate all of the mandatory sections to be addressed in the EIR. The EIR needs to carefully define reasonable alternatives for the project. No discussion of alternatives is

provided in the NOP. Growth inducement and cumulative impacts are also very important issues that must be evaluated in the for this project. In conjunction with the LAFCO Staff, I am available to discuss these comments and provide input into the EIR process, including reviewing the Screencheck EIR if desired. I look forward to reviewing the Draft EIR when it is made available for public review and comment. Thank you in advance for your consideration of these comments.

Sincerely,

Tom Dodson

Tom Dodson
cc: Kathleen Rollings-McDonald

Sandy Steers
P.O. Box 423
Fawnskin, CA 92333
(909) 878-3091

RECEIVED
MAR 20 2002

15 March 2002

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave., Third Floor
San Bernardino, CA 92415-0182
Attn: Tracy Creason, Senior Associate Planner

Re: Environmental Impact Report (EIR) for Moon Camp TT #16136

Dear Ms. Creason,

I am writing to go on record as opposing any rezoning of the Moon Camp property and thus oppose the proposed development in Moon Camp. In this regard, I have a number of concerns and questions.

My first concern is water availability in the Fawnskin and the Big Bear Valley. We have been told to conserve water by a number of local and County agencies and in the past when there were droughts similar to the one we are now experiencing, there were occasions when water usage was restricted, there was a moratorium on building and water pressure in Fawnskin was so low that water was not availability. How will these conditions be affected by the addition of these new homes? And especially how will they be affected when a number of other developments are being built at the same time and in the same general area? I would like to know the affects on our water supply both during construction and after the homes are occupied. What percentage of the homes do you expect to be occupied full-time and what percentage on weekends and on especially busy holidays? How does this percentage compare with current Fawnskin occupancy and how will the additions affect the water supply?

Our water, I realize comes from underground aquifers and the DWP and owners have stated that there are two new wells on the property, so water supply will not be an issue. But those aquifers for those two wells must connect with the aquifers that currently supply Fawnskin and other areas in the valley. How, in fact, do the underground water supplies, or aquifers, connect to each other throughout the Valley? Will taking water from the two wells on the Moon Camp property in any way affect the amount of water available or the water level in any of the other under ground water sources in Fawnskin or the rest of the Valley? If these underground water sources do connect, how does the developer propose to guarantee that none of our other water sources will be affected or depleted by the addition of the homes proposed in this development?

Our local electricity providers have already expressed concern about the amount of electricity available to the valley, even with the number of homes that are currently here. Considering that the Forest Service has already ruled out the possibility of larger lines being installed to bring electricity up to Big Bear, how will additional electricity be provided to supply these homes to be added to Moon Camp? Bear Valley Electric already states (in applying for new lines with the Forest Service, and in an interview I conducted) that there is not sufficient electricity available to the Valley during peak times, without additional development. How will this new development affect the electricity availability? And how will the electricity availability be affected by this development in additional to the surrounding developments that are being discussed and the developments already approved and in process all around the Valley? Will the small power station Bear Valley Electric plans to build be sufficient for all the needs around the Valley and those being added with new developments without ever having the possibility of brown outs or black outs during peak usage times?

This area is now pristine forest and lakefront with a large number of native trees, supporting a native habitat for many species of plants and wildlife. The current proposal says at least 730 trees will be cut down in order to move the highway. How many trees will be cut down by the time the development is completely built out with all the proposed roads, driveways, homes, marina, etc.? What percentage of the number of trees now on the property does this equate to? These are old growth trees. How does the developer expect to mitigate for the destruction of old growth trees, in the aesthetics, in the destruction of the view from above the property and from the lake and from the Big Bear side of the lake? Planting new trees is not an acceptable mitigation since the people living in the Valley today are the ones that will be affected by the cutting of these trees and the new trees will not reach significant size for 30 to 50 years, and mitigation is supposed to reduce the affect to insignificant. How will the loss of the aesthetics from this change be mitigated for the current residents of Fawnskin and the Valley?

How will the cutting of this many trees affect on the eagle habitat and on the other wildlife that utilizes this area? And how will this affect be mitigated to insignificant, especially for the current wildlife population? As new immature eagles arrive each year during the winter months, it seems that they spend the majority of their time in unpopulated areas rather than in developed areas that used to be eagle habitat, such as Eagle Point. How will this development and the cutting of these trees affect the use of this area as eagle habitat, not only for eagles that have already arrived and utilized these trees, but for the eagles that will be arriving for the first time over the next 50 years until new trees have grown? We have also been looking forward to eagles potentially using Big Bear Valley as a nesting area, as they once did, and the biologists say this is a possibility, given the right conditions. How will the changes in this particular eagle habitat affect the possibility of eagles using this Moon Camp area as a nesting area and how will these changes affect the potentiality of eagles nesting in Big Bear Valley at all?

As for the other wildlife, which types of wildlife and how many now utilize this Moon Camp area as a home and as a corridor to or from the forest or the lake? How will the cutting of

the trees and the development of homes affect this usage and how will it affect this wildlife, now and in future years? Will it reduce the number of wildlife that this area will support, and if so, by how much and for which types of wildlife? This area is also a very specialized plant habitat, especially for pebble plains and wetlands habitats. How will the cutting of these trees and this development affect these specific habitats and by what percentage will it reduce the amount of each of these specialized habitats that are available throughout Big Bear Valley? It has been stated that there are also threatened and endangered plants growing in this Moon Camp area. How many and what types of plants are there currently and how will the development affect these plants and how by what percentage will the numbers of these plants be reduced around the Valley if these plants are destroyed?

What affect will the cutting of these old growth trees and the development of this property have on the air quality in this area and in the Valley? How will the loss of these old growth trees affect the amount of oxygen that is created in this area? How many wood burning stoves, gas propelled lawn equipment, recreational vehicles, automobiles and automobile trips will be added to this area and what affect will this have on the air quality in Fawnskin and in the Valley? How will the additional watercraft from this development affect the air quality? I have asthma and came to this area for the clean air. How will any loss in air quality created by any of the above mentioned items affect people in the area with asthma or other respiratory conditions?

Fawnskin is a rural area, not an urban area like other places in the County. How will the affects of this development be measured differently for a rural area than for an urban area? And how are the mitigations for rural areas handled differently than for urban areas?

With the road changes and the addition of homes in this area, I am concerned with the amount of light pollution that will be added. What is the lighting proposal for the roads in the development and for the homes? How will the addition of light pollution be mitigated so that the affects of additional homes creates an insignificant difference to the wonderful dark skies that we now enjoy?

So far, the County has not had an outstanding record in enforcing mitigation terms once they have been approved. How will the mitigation terms for this development be enforced differently by the County than they have in the past to guarantee that all the mitigation terms are adhered to?

Thank you for taking my concerns into account.

Most sincerely,

Sandy Steers

Thomas and Kimberly Brickley
P.O. Box 88/39745 Flicker Road
Fawnskin, CA 92333

Ms. Tracy Creason
Senior Associate Planner
Advance Planning Division
Land Use Services Department
County of San Bernardino
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

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MAR 20 2002
LAND USE SERVICES DEPT.
ADVANCE PLANNING DIVISION

March 15, 2002

Ms. Tracy Creason
Senior Associate Planner
Advance Planning Division
Land Use Services Department
County of San Bernardino
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

Dear Ms. Creason:

We are responding to the "Notice of Preparation of Environmental Impact Report for RCK Properties, Inc., Application for Tentative Tract Map 16136".

Questions we would like answered by the Environmental Impact Report (EIR) analysis?

- What will be the increase in water sewer requirements and who will pay for them?
- How much longer it will take to drive to Big Bear Lake with the increase in traffic?
- What will be the decibel/noise increase due to the traffic and highway realignment to the residents near by?
- What will be the expected runoff levels and sediment loads be?
- What will be the increase in smog and fireplace smoke and its impact on the valley?
- What will be the increase in light pollution?
- What will be the impact to the eagles, wildlife and endangered flora and fauna?
- What will be, if any, the height restrictions required as to protect existing homeowner views and lake access.
- What will be the cumulative environmental effects of proposed developments at Moon Camp, Cluster Pines/Marina Point, Brookside Road, Deer Trail and the new zoo? Mitigation should be site-specific to Fawnskin, not based on a model.

We respectively object to the proposed development and zoning change due to:

1. Eagle habitat will be jeopardized or destroyed.
   Note: For the last seven winter/years we have lived on Flicker Road. We have seen several bald eagles annually use trees within the proposed development as hunting and resting places.

2. Endangered flora and fauna will be jeopardized or destroyed.

3. 92 plus homes, 100 private docks and the realignment of North Shore Drive/Hwy 38 will increase traffic, noise, light and air pollution well beyond acceptable levels not to mention this development is totally inconsistent with mountain character of Fawnskin and why we purchased our home on Flicker Road.

4. The number of trees to be cut down (700 – 1,000).

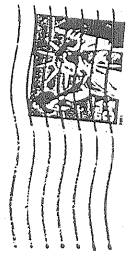
5. Lack of water and sewer capacity to support a development of this size.
   Note: Big Bear Valley including Fawnskin suffers from a shortage of water. We are repeatedly encouraged to conserve water and warned of the consequences by the County and City water agencies.

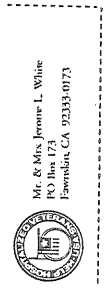
6. The U.S. Forest Service has been attempting to (and or facilitate the) purchase the land within the proposed development for several years and has entered into good faith negotiations with the owners. We are not against the owners right to develop their land within the existing General Plan (RL-40), however due to the above mentioned objections we strongly believe the property should remain undeveloped and managed by the U.S. Forest Service allowing for managed limited day use by the public.

Respectfully,

Thomas and Kimberly Brickley
P.O. Box 88/39745 Flicker Road
Fawnskin, CA 92333
909-866-2839

cc: Dennis Hansberger, San Bernardino County District Supervisor
Theresa Kwappenberg, San Bernardino County Planning Commissioner





Mr. & Mrs. Jerome L. White
PO Box 173
Fawnskin, CA 92333-0173

Fawnskin, California
March 16, 2002

County of San Bernardino
Advance Planning Division
385 North Arrowhead Ave 3rd Floor
San Bernardino, California

RECEIVED
MAR 19 2002

Gentlemen.

As residents of Fawnskin for the past 15 ~~years~~ we know that changes will be made.

We have problems with our water at the present time, on week-ends. The water flows from our faucets in a trickle. If the development is approved, as requested, we probably won't have any water on weekends.

We have sewer odors now from our present lines, and nothing has been done to improve the present lines. We have had several sewerage spills into the lake.

When the trees, about 1000 plus are removed for the housing and the construction of the highway, we will have flooding from the run-off during the rainy season. How many other trees will die during all of the construction?

What will happen to the eagles, coyotes, wild turkeys, hawks, etc. They take shelter in the pine forest. They stray into our yard, as we are close to the forest and enjoy watching them. With the increase of the noise, pollution and emission of auto traffic will increase, what will happen to all the animals and birds?

Attached is a two page list of the negative effects to the Big Bear Valley, the lake and to the people living here now.

1 of ...

page 2

There is also a letter from our Congressman, Jerry Lewis -
We think our Supervisor and the Congressman, Jerry Lewis should act to stop this development and make it part of our National Forest

Yours truly
Mr & Mrs Jerome L. White

cc to:
Congressman Jerry Lewis
Mike Williams
Supervisor Dennis Hansberger

- Air Quality
  There will be increased auto emissions due to increased number of cars and slower speeds caused by increased traffic congestion, increased emissions from fireplaces and wood burning stoves, as well as boat engines, ATV's, leaf blowers, and recreational vehicles, and cumulative air pollution from this and all projects around the valley, including during construction phase.
- Water Quality
  There will be additional runoff to the lake which is already saturated with fertilizer, etc. from runoff in existing landscaping and development areas elsewhere.
- Water availability (especially in drought times, which are a natural part of our climate cycle)
  There is currently a shortage of water and we are in drought conditions. In the late 80's and early 90's people were without water on major holidays in the summer and pressure was reduced on streets at higher elevations. A fire would have caused disaster. There is no more water in the valley now and 92 homes will certainly intensify the situation.
- Energy Factors
  Local electricity providers claim no more power lines can be added nor can solar power be used and that the valley is already short of the electricity it needs. Continuous building elsewhere in the valley, as well as this project, will continue to exacerbate the problem plus increase the chances of blackouts, etc.
- Sewer Capacity
  The manholes in the streets repaved during 2000 and 2001 have not been raised and if there are any problems, these manholes will have to be located and jackhammered out before anything can be done. Are the pipes in Fawnskin of sufficient capacity to handle additional homes? Cumulative sewer effects with all the developments proposed and in progress must be addressed. There are already sewer odors in some homes due to being overloaded and nothing has been done with these.
- Tree Removal
  The development expects the removal of 730 trees (25% of existing trees), which only addresses those to be removed to reroute the highway. How many additional trees will be removed to build homes? Plus how many will die due to stress of construction. The large, old growth trees removed will not grow back in our lifetime, so planting lots of replacement trees is not sufficient mitigation.
- Eagle Habitat
  Eagles use many of the trees throughout the entire Moon Camp area, not just a few trees along the shoreline. The whole Moon Camp area is eagle habitat. Eagle perch trees take hundreds of years to grow, saving a few existing trees will not provide habitat into the future.
- Wildlife Habitat
  This area is also habitat for blue herons, ospreys, hawks and waterfowl. Wildlife (deer, coyote) access lakeshore through property.
- Plant Habitat – This will destroy endangered/threatened habitat areas (pebble plains, wetlands) known only in Big Bear, as well as endangered/threatened flora in the area.
- Light Pollution/Glare – Additional lighting from 92 homes would greatly diminish the intensity of the nighttime sky.
- Medical Services – We have limited medical facilities, including ambulance service, inadequate for increased population.

- Fire Protection – The Fawnskin Fire Department is very small, inadequate for planned development.
- Time frame for Biological Assessment (are survey windows adequate/appropriate) – Due to seasonal changes in animal migration and living patterns, anything short of a one-year study will not fully assess the impact on animal life.
- Traffic Study –Traffic would increase dramatically with addition of Moon Camp, Cluster Pines, Brookside Road and the new Zoo. Holiday traffic is currently unacceptable in the valley. Weekend and vacation use/rental impact on traffic and parking should be addressed; multiple cars per house/unit. What are the cumulative effects of increased traffic in the town of Fawnskin, as well as Stanfield Cut Off and the south shore communities?
- Public Safety – Additional traffic increases danger to pedestrians and school bus stop/crossings in the downtown Fawnskin area where crossing the highway is necessary.
- Public access - Public access to the lakeshore would no longer exist, as development would be a private, gated community.
- Designated Scenic Highway – The scenic value of the highway would be removed since views from the highway would be obstructed by multiple home construction.
- School System - How will this impact the limited classroom capacity?
- Seismic Activity - A fault runs through Windy Point. Is there an issue with regard to earthquakes and the "seismic effect", as well as for the emergency personnel and equipment available in such an instance?
- Property Values - What impact will "high density" housing development have on property values near the property, as well as throughout Fawnskin?
- Noise - Localized effects (construction and long term) and cumulative effects (sound travels across lake)
- Lake Usage – Increase watercraft on lake due to 100-slip private marina. Additional watercraft also causes further lake pollution.
- Quality of Life –Fawnskin and the north shore have a serene ambiance, frequently characterized as quiet, natural, uncongested and lake-accessible. Proposed development would change the mountain character of the north shore from "country" living to "city" setting.
- City standards non applicable here
  "City" development standards should not be applied to Fawnskin. Impact comparisons should not be made with an urban area.
- Impact to South Shore and North Shore Communities – Loss of revenue to lodge owners and marina boat rentals. Impact of additional traffic, noise, etc. on the already overburdened South Shore communities.
- County Services – What impact on fire, sheriff, and sewer services?
- Environmental Terms & Conditions – County has a very bad record for not enforcing mitigation terms and conditions presently. Would there be any change?
- Developer's Track Record – The developer has a bad track record regarding adhering to mitigation terms and protecting areas developed. How would that be mitigated.
- Alternative Usage – Explore the potential to expand the National Forest lands as an alternative to proposed rezoning.
- Cumulative Effects – Increasing the population increases all the effects (the multiplier factor). The cumulative effect of developments at Moon Camp, Cluster Pines, Brookside Road, Deer Trail and the new zoo with the existing environment must be assessed collectively with regard to all issues. City development standards should not be applied. Mitigation should be site-specific to Fawnskin, not based on a model.

Michael P. Dawson
P.O. Box 1097
Big Bear Lake Ca. 92315

ATTN: Tracy Oneman

SEP 29 2012

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave, Third Flr
San Bernardino, Ca.
92415-0182

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March 16, 2002

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave., Third Floor
San Bernardino, CA 92415-0182
Attn: Tracy Creason, Senior Associate Planner

To the County:

Regarding Environmental Impact Report (EIR) for Moon Camp TT#16136

As a family owner and employee of a marina and fishing area on the North Shore of Big Bear Lake, I am concerned about how this development at Moon Camp will affect my business. How many more watercraft are expected to be on the lake because of the addition of this marina tied with the Moon Camp development? And how will the addition of these watercraft affect the quality of the lake water and the fishing from the perspective of additional noise, additional water pollution and addition people in the area?

Also, many of my customers rent boats to drive along the peaceful views of the North Shore. How is it anticipated that the view will change from the lake by the addition of this development and how will the change in this view affect desirability of renting boats on the North Shore to cruise along this area?

Will building these homes add additional pollution to the lake water either during construction or after the development is complete, in terms of erosion, pollution from lawn chemicals and households products, etc.? If so, how will the pollution affect lake usage and the quality (for eating) of the fish in the lake?

Thank you for your time.

Yours truly,

Mike Dawson

Manager Gray's Landing Inc.
P.O. Box 1008
Big Bear Lake Ca 92315

March 16, 2002

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave., Third Floor
San Bernardino, CA. 92415-0182

RECEIVED
MAR 1 9 2002

ATTN: Tracy Creason, Senior Associate Planner
RE: Moon Camp EIR, TT #16136

Dear Ms. Creason,

I'm submitting this letter in reference to the Moon Camp EIR. I'm a resident and owner of a home on Flicker Road for 27 years. I'm very concerned that a rezoning from one home on 40 acres to 92 homes on 64 acres would be considered by the county. This would greatly damage Big Bear Lake.

My concerns include the following:

1. Consider the number of trees and sensitive and endangered plants that will be removed by the rerouting of State Route 38 in the project, as well as on housing sites. It would take years for the current trees to grow back if trees were removed and/or no requirements are made to replant.

2. Consider the number of eagle perch trees along a corridor that is restricted to the public during eagle habitat season. Fake eagle perch trees have not worked or have been removed after projects are signed off.

3. Consider that our shoreline is public and that public access will be greatly eliminated if dredging in front of lake front homes change the current slope. The public can no walk along the shore if docks and fencing are allowed. (Walk the Eagle Point public access for example)

4. Consider where the public will park to hike and fish along the shoreline if this becomes a gated community along the water.

5. Consider the density of 132 condominiums on 12.5 acres at Marina Point Development adjacent to Moon Camp. (Has a cumulative EIR been done on each of these sites?)

6. Consider the current wildlife corridor from the National Forest being diminished or abolished to the lake through Cluster Pines and Moon Camp. How will the wildlife reach the lake? Currently all the neighbors up the hill, including us, have never fenced off our properties to make this a problem. Animals are free to travel across our property and to the lake.

7. Consider the loss of one of the last scenic drives along the lakeshore of Big Bear. This would be greatly affected if the highway is realigned.

8. Consider the homeowners who have lived in Fawnskin for years and paid taxes on property they purchased knowing the 64-acre site was zoned for one home.

9. Consider the safety of adding 100 more slips to the 75 slips to be added at Cluster Pines. This will create a density on the already crowded lake and its use to the public and property owners who wish to use the lake as well.

10. Consider the 132 condos at Cluster Pines and the 92 homes adjacent adding traffic to a two-lane mountain road on either side of the development.

11. Consider the density of this project and the adjoining condos as not in keeping with the community plan as it currently is in our town of Fawnskin.

12. Consider the added number of students in our currently overcrowded school system and their safety in getting to and from school off a congested highway.

13. Consider the exhaust emissions with boats in more than 100 new boat slips and how the water and wildlife on shore and in the water will be effected

I thank you for taking these concerns of mine into consideration.

Mary Lu Drake

Mary Lu Drake
P.O. Box 164
Fawnskin, CA. 92333
(909) 866-2262

P O Box 368
Fawnskin CA 92333
March 16, 2002

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MAR 19 2002

San Bernardino County
Advanced Planning Division
385 North Arrowhead Avenue, Third Floor
San Bernardino CA 92415-0182
Attn: Tracy Creason, Senior Associate Planner

Dear Ms Creason:

We are writing regarding EIR TT # 16136 for Moon Camp from applicant RCK Properties, Inc.

We see the proposed change and the planned development creating significant problems in the Fawnskin and surrounding areas and having significant ramifications on our valley. We moved to Fawnskin (rather than Big Bear Lake) because of its low density appearance and atmosphere; this project will destroy the rural feeling that makes Fawnskin unique in the valley. We further object to the plan for the following specific reasons:

1) There is currently a water shortage in Fawnskin as well as the entire valley, and no additional water is available from down the hill to support the additional residences
2) Any down zoning would affect eagle and other wild animal habitat;
3) The number of trees that would have to be removed for roads, easements, and building sites (estimate 730 large old growth) is not tolerable and will destroy the natural atmosphere that people come to this area to enjoy;
4) The lakefront lots would destroy the lake view from the existing highway; public access to the lake would be denied because of gating
5) Moving the highway would increase traffic noise levels to existing residences above the proposed area, as well as destroy the pleasant ambiance of the curving mountain roads passing by a gorgeous lake view;
6) 92 new homes in a subdivision would cause serious light pollution in the Fawnskin area;
7) State Route 38 in that area could not adequately support the increased traffic flow;
8) Building large houses on minimum-sized lots, as would be allowed by any downsizing, has already been done in Big Bear Lake and would be inconsistent with the mountain rural character of Fawnskin;
8) Air pollution would be increased from wood burning stoves and automobile traffic;
10) We already have barely adequate medical, ambulance, and fire protection in the valley;
11) Increased water craft usage on the lake would cause further water pollution.

For these reasons, we are opposed to this development. Thank you.

Very truly yours,

A. Claudia Eads, MD

Donald L. Eads, MD

CC: Dennis Hansberger

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MAR 2 1 2002

March 16, 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave.
Third Floor
San Bernardino, Ca. 9245-0182

Attn.: Tracy Creason, Senior Associate Planner
Re: Environmental Impact Report (EIR) for Moon Camp TT #16136

From: John J. Wall, 1600 N. Orange Grove Ave., L.A., Ca., 90046

Dear Ms. Creason:

My wife and I have owned the property at 39939 North Shore Drive in Fawnskin for just about four-and-a-half years now. We plan to make it our full-time residence when the time is right. A major reason we purchased the property was the bucolic nature of Fawnskin. I fear that the fundamental nature of the town is now threatened by the potentially disastrous high density developments currently being contemplated. I would urge you to closely examine the following issues:

Tree Removal: Though the developer claims that 730 trees will be removed, history tells us that the final number is always significantly higher. I would like to see specific studies reflecting the actual number of trees that will be removed, destroyed or permanently damaged, reflecting not just the impact of the proposed re-routing of Scenic Highway 38, but of all proposed building and ancillary damage due to heavy equipment and construction. The disruption to the area residents from traffic, air pollution, noise pollution and water pollution may well be incalculable, but I would like to see specific and documented study as to the potential levels of each.

Eagle Habitat: Our home borders the cove where the gas connection line is now. We look out over the lake towards the dam as well as towards Moon Camp. Our house has been at this location since 1926. I can state, as an eye witness, and can also offer the testimony of a number of other eye witnesses, that eagles have regularly and annually perched in the trees directly in the area where the developer proposes to re-route the state highway. As recently as February 12, my cousin and I saw two full grown eagles in the morning, a large immature around lunch time and three large immatures in the trees late in the afternoon. In addition, I have kept a log of eagle spottings from my house every year we've been there. They match the time of year and the tree location annually. As we know, eagles are creatures of habit, and destroying their perches could have a massive impact on their precarious well-being. It's short-sighted and wrong. I would encourage you to do a lengthy, in-depth study on the impact of this dangerously dense development in an area the eagles call home.

However, the eagle is only part of the story. I know the specific part of the lakeshore that this development will violate rather well. The number of great blue heron that use the coves as feeding areas has increased each year we've been in Fawnskin. Hawks and ospreys are regularly seen perched in the tops of trees looking for fish or ground game. American White Pelicans swim by a few times a year. The pebble plains and the wetlands are unique to our area. Again, I feel strongly that in-depth quantitative as well as qualitative analysis be done as to how much havoc will be wreaked by the destruction of these natural resources.

Economic impact: Other than putting money in the hands of a few individual developers and real estate agents, the overall economic impact on the entire area could be extemely negative in the long run. For example: if the eagle habitat is eroded past saving, the lake becomes polluted beyond use by the addition of hundreds of new boats, and the water supply drops so low that people begin to experience more than just occasional water outages; how will the tourist industry, upon which so many depend for their living, continue to exist? Who will come to a beautiful mountain valley with no wildlife, no recreational boating, and no rural settings? I believe an economic impact report is an essential part of this study, and I would strongly suggest that a "worst case scenario" component as to how many tourist dollars could potentially be lost be included.

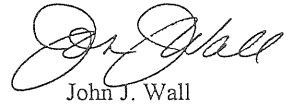
I suggest this because it is my understanding that the developers involved in Moon Camp have a very poor track record regarding promises to mitigate and protect, which means a worst-case scenario may well become the reality. Since the county has a poor track record enforcing such protections, what would be your suggestion for insuring that the rules would be abided by? I would like to see what the civil and criminal liability would be should the developers behave in the irresponsible manner indicated by their past acts. I would further suggest that both civil and criminal penalties be put in place if they do not yet exist. I would like to know what the results of your research are on the question of the liability of the developers should they fail to live up to their promises.

As I stated earlier, our house was built in 1926. In the seventy-six years since, the Moon Camp area has been a monument to what Fawnskin was and is: a bit of rural beauty, population 380. The addition of ninety-two densely packed homes in a gated community would destroy a setting that reflects some of the best of the natural beauty the valley has to offer. Why not use this opportunity to burnish this treasure rather than destroy it? With the Discovery Center, the upcoming relocation of the Zoo, the construction of the Alpine Path, much has been done to take advantage of the lovely atmosphere of Fawnskin to benefit everyone in the valley. Just take a look at how many cars line North Shore Drive to see the fireworks on the 4th of July. Why not protect it? I would urge you to study the feasibility of expanding the National Forest lands and extending the Alpine Path so that all visitors to the valley could enjoy this natural wonder. Furthermore, I feel specific figures and models should be created to measure the upside of non-development, and how much in additional revenue an increase of visitors would generate.

Please remember, Fawnskin is a unique environment. Models normally applied to city-style development really don't fit. To be fair, you must create a model specific to Fawnskin. And that model must reflect not just the proposed Moon Camp development, but the further impact of Cluster Pines, Brookside Road and Deer Trail, all of which, in my opinion, raise the potential for negative impact exponentially. Again, I would like to see specific figures and estimates for all of these.

Finally, and thank you for your patience, if the developers wish to use the land as it is currently zoned, one house per forty acres, I would have no objection whatsoever.

Sincerely,



John J. Wall

ATTN: TRACY CREASON

SR. ASSOCIATE PLANNER

ADV. PLANNING DIV.

THIRD FLOOR

COUNTY OF SAN BERNARDINO

FAX #909-387-3223

FROM:

John J. Wall
39939 No. Shore Drive
Fawnskin

Re: Moon Camp EIR

NOTE: A LETTER IS IN THE MAIL. I JUST WANTED TO MAKE SURE I DIDN'T MISS THE DEADLINE.
THANKS.
J. Wall

March 16, 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave.
Third Floor
San Bernardino, Ca. 9245-0182

Attn.: Tracy Creason, Senior Associate Planner
Re: Environmental Impact Report (EIR) for Moon Camp TT #16136

From: John J. Wall, 1600 N. Orange Grove Ave., L.A., Ca., 90046

Dear Ms. Creason:

My wife and I have owned the property at 39939 North Shore Drive in Fawnskin for just about four-and-a-half years now. We plan to make it our full-time residence when the time is right. A major reason we purchased the property was the bucolic nature of Fawnskin. I fear that the fundamental nature of the town is now threatened by the potentially disastrous high density developments currently being contemplated. I would urge you to closely examine the following issues:

Tree Removal: Though the developer claims that 730 trees will be removed, history tells us that the final number is always significantly higher. I would like to see specific studies reflecting the actual number of trees that will be removed, destroyed or permanently damaged, reflecting not just the impact of the proposed re-routing of Scenic Highway 38, but of all proposed building and ancillary damage due to heavy equipment and construction. The disruption to the area residents from traffic, air pollution, noise pollution and water pollution may well be incalculable, but I would like to see specific and documented study as to the potential levels of each.

Eagle Habitat: Our home borders the cove where the gas connection line is now. We look out over the lake towards the dam as well as towards Moon Camp. Our house has been at this location since 1926. I can state, as an eye witness, and can also offer the testimony of a number of other eye witnesses, that eagles have regularly and annually perched in the trees directly in the area where the developer proposes to re-route the state highway. As recently as February 12, my cousin and I saw two full grown eagles in the morning, a large immature around lunch time and three large immatures in the trees late in the afternoon. In addition, I have kept a log of eagle spottings from my house every year we've been there. They match the time of year and the tree location annually. As we know, eagles are creatures of habit, and destroying their perches could have a massive impact on their precarious well-being. It's short-sighted and wrong. I would encourage you to do a lengthy, in-depth study on the impact of this dangerously dense development in an area the eagles call home.

However, the eagle is only part of the story. I know the specific part of the lakeshore that this development will violate rather well. The number of great blue heron that use the coves as feeding areas has increased each year we've been in Fawnskin. Hawks and ospreys are regularly seen perched in the tops of trees looking for fish or ground game. American White Pelicans swim by a few times a year. The pebble plains and the wetlands are unique to our area. Again, I feel strongly that in-depth quantitative as well as qualitative analysis be done as to how much havoc will be wreaked by the destruction of these natural resources.

Economic impact: Other than putting money in the hands of a few individual developers and real estate agents, the overall economic impact on the entire area could be extemely negative in the long run. For example: if the eagle habitat is eroded past saving, the lake becomes polluted beyond use by the addition of hundreds of new boats, and the water supply drops so low that people begin to experience more than just occasional water outages; how will the tourist industry, upon which so many depend for their living, continue to exist? Who will come to a beautiful mountain valley with no wildlife, no recreational boating, and no rural settings? I believe an economic impact report is an essential part of this study, and I would strongly suggest that a "worst case scenario" component as to how many tourist dollars could potentially be lost be included.

I suggest this because it is my understanding that the developers involved in Moon Camp have a very poor track record regarding promises to mitigate and protect, which means a worst-case scenario may well become the reality. Since the county has a poor track record enforcing such protections, what would be your suggestion for insuring that the rules would be abided by? I would like to see what the civil and criminal liability would be should the developers behave in the irresponsible manner indicated by their past acts. I would further suggest that both civil and criminal penalties be put in place if they do not yet exist. I would like to know what the results of your research are on the question of the liability of the developers should they fail to live up to their promises.

As I stated earlier, our house was built in 1926. In the seventy-six years since, the Moon Camp area has been a monument to what Fawnskin was and is: a bit of rural beauty, population 380. The addition of ninety-two densely packed homes in a gated community would destroy a setting that reflects some of the best of the natural beauty the valley has to offer. Why not use this opportunity to burnish this treasure rather than destroy it? With the Discovery Center, the upcoming relocation of the Zoo, the construction of the Alpine Path, much has been done to take advantage of the lovely atmosphere of Fawnskin to benefit everyone in the valley. Just take a look at how many cars line North Shore Drive to see the fireworks on the 4th of July. Why not protect it? I would urge you to study the feasibility of expanding the National Forest lands and extending the Alpine Path so that all visitors to the valley could enjoy this natural wonder. Furthermore, I feel specific figures and models should be created to measure the upside of non-development, and how much in additional revenue an increase of visitors would generate.

Please remember, Fawnskin is a unique environment. Models normally applied to city-style development really don't fit. To be fair, you must create a model specific to Fawnskin. And that model must reflect not just the proposed Moon Camp development, but the further impact of Cluster Pines, Brookside Road and Deer Trail, all of which, in my opinion, raise the potential for negative impact exponentially. Again, I would like to see specific figures and estimates for all of these.

Finally, and thank you for your patience, if the developers wish to use the land as it is currently zoned, one house per forty acres, I would have no objection whatsoever.

Sincerely,

John J. Wall

RECEIVED
MAR 20 2002

March 17,2002

County of San Bernardino
Advanced Planning Division
385 N. Arrowhead Ave.
Third Floor
San Bernardino, CA 92415-0182

RE: Issues Concerning Developing Moon Camp near Fawnskin
And Cluster Pines (Marina Point Development)

Dear Whom It May Concern;

I'm a local resident of Fawnskin, live here year-round and a property/homeowner here. I'm writing you is because I'm concerned about the two proposed developments in my area. Both of these developments will obstruct the public lake access, which means I will have to walk or drive farther in order to go shore fishing and this does not sit well with me. It also means the view of the lake from the highway will be blocked forever with a bunch of houses in the way of the view. Building more houses and buildings in the area will have a devastating impact.

1. More houses/buildings means more vehicles, This means more accidents and more accidents means that the current road will be re-located to accommodate more vehicles. Not to mention more auto emissions, increased emissions from fireplaces, RV's, and more boats during and after constuction of these developments.
2. Energy/utility factors- I've spoken to the local electric company and they state that no more electric lines can be added as we are already short of the electric needed as it is. If these proposed developments are allowed then it will only create more of a problem without any solution And I refuse to pay any more taxes or such for such a thing for a new electric plant here. This will just increase the chance of brown outs and black outs.

   Will our water be safe? There will be additional run-off into the lake which is already polluted with runoff from the existing development areas here, Will the wells in the area be safe? Or will the homeowners who have existing wells have to drill farther down? We are already in a drought cycle and there is currently a shortage of water. I don't want to go without water on the holidays like we had to in the early 1990's. not to mention we sometimes have a drop in water pressure as it is. A fire in drought conditions now would cause a disaster for us and the proposed developments.

   Sewer- I doubt that the sewer pipes here in Fawnskin are of sufficient capacity to handle anymore additional homes. During the holiday weekends there are already sewer odors because the Sewer pipes can not handle the holiday "overload" and sometimes the sewer pipes sludge backs up into my home pipes.

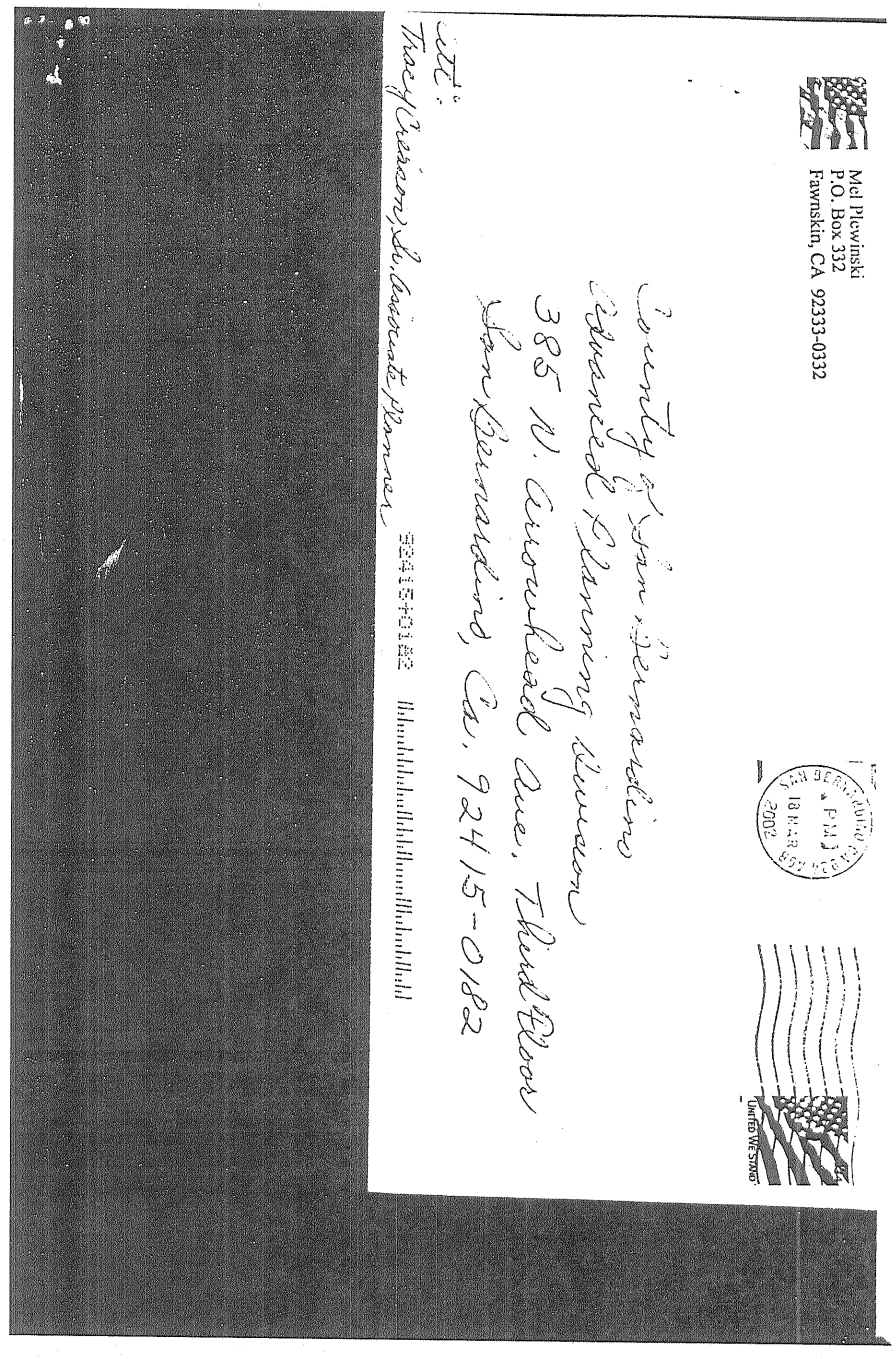
3. Trees/wildlife habitat- We are in an Eagle wintering area, not to mention the blue herons, ospreys, ducks, and hawks along with the Robins, blue jays, squirrels, raccoons. wild turkeys, mountian lions, and coyotes that inhabit this area as well. These birds and animals use many of the trees throughout the entire Moon Camp area. Not just a select few. Just saving a few existing trees won't cut the mustard to provide habitat into the future. These animals use the existing property to access the lakeshore. Taking out about 25% of the existing trees will destroy at least 25% of this habitat. This 25% only takes into consideration of trees cut down to re-route the highway. How many more trees will be taken out to build 92 additional homes and 132 condos? You'll just end up destroying the endangered/threatened wildlife habitat areas and plants native to this area.
4. Light pollution/Glare- Additional lighting from 92 more homes and 132 condos would greatly diminish the intensity of the nighttime sky and make it harder to view the stars and plants and meteor showers. It would be like viewing the nighttime sky with someone shining a light where you wanted to see.
5. Medical Services- We have limited medical facilities including ambulance service and it would be way inadequate for an increased population here.

6. Property Values- What impact would 92 homes and 132 condos have on my property. I don't want to pay more taxes. I already pay too much as it is.
7. Impact to North Shore and South Sore Communities. – Over New years weekend I had to wait 4 hours at the bowling barn to bowl. It is usually a 15 to 20 minute wait for a lane. It was because the already overburdened South Shore resorts and the tourist "swell" over the holiday weekend.
8.

Fawnskin is the "quiet" side of Big Bear Lake and it would be very nice to keep it that way. It is not a "CITY" it is a "Small town" and I do not want it destroyed by "City" developments . Plus the developer has a real bad track record of adhering to mitigation terms and protecting areas developed. I do not want to see "MY" home destroyed because of these two proposed developments.

Sincerely,

Martha Brown
P.O. Box 123
Fawnskin, CA 92333



3-17-02

To: Tracy Creason: Sr. Associate Planner
FROM: Mel Plewinski - 1146 Illini Dr. Fawnskin, Ca
RE: EIR for Moon Camp TT16136 and Cluster Pines project.

RECEIVED
MAR 19 2002

Ms. Creason,

I am very opposed to the two projects mentioned above. I hope this horrible idea is squashed. Fawnskin has always had a population of 380, if this horrendous project goes through it will at least double & probably triple the population. Is our hospital & police capable of handling this influx of people? In fact the hospital & sheriff station will have to be enlarged & hire more personnel. And what about fire services? And with the hiring of more sheriffs several more police vehicles, I suppose several more traffic signals will need to be installed. Why not a Fawnskin police station? I know growth is good for business owners, but not everyone in Fawnskin owns a business, many of us are retired & enjoy the peace & quiet of living in this small town & we'd like to keep it that way. It seems you are trying to make a small town into New York City, where I was born. Are there plans for a "Statue of Liberty"? May even Times Square?

What about the destruction of trees what about our wildlife? What about added pollution & congestion? what about our water supply?

I like to think of my town as a Mayberry RFD, not a metropolis. I am very opposed to this plan. I hate it & I think it sucks.

Please read this before discarding in the wastebasket.

Against growth,
Mel Plewinski
1146 Illini Dr.
P.O. Box 332
Fawnskin, Ca. 92333

909-866-4042

V. JEKNAVORIAN
Box 1549
Big Bear Lake, Ca 92315

County of San Bernardino
ADVance Planning
Division
385 No. Arrowhead Ave. 3rd floor
SAN BERNARDINO

CA. 92415-0182

92415$0182

3/17/02

Ms.
Tracy Creason
Senior Associate planner
385 No. Arrowhead Ave
San Bernardino CA 92415

RECEIVED
MAR 19 2002

Dear Ms Creason.

With this letter I would like ~~to~~ State my position on the Moon Camp project (EIR TT 16136 In my previous letter I had expressed my concern with this project. I believe that one dozens of issues to be addressed such as pollution, loss of Eagle habitat, water quality, sewer capacity, loss of our unique and beautiful scenic highway by realignment Tree removal, water availability. specially in drought years such as this past one, loss of endangered plant and many others.

I hope and pray that the County planning Commission will take a hard look at this project before granting the request of the developers.

Sincerely
Vahe Jeknavorian

VAHE 'VIC' JEKNAVORIAN
BOX 1549
BIG BEAR LAKE, CA 92315

RECEIVED
MAR 2002

3/17/02

To Whom it May Concern,

I would like to address an issue regarding:
Environmental Impact Report for Moon Camp TT#16136

Although there are numerous points to argue against this project, the biggest impact on the area would be the removal of over 700 trees as a starting point to reroute the highway. What percentage of the trees that are currently on the property does this equate to? How many additional trees would be removed at future dates for construction, access, and "convenience"? What stress levels would the remaining trees encounter due to construction and general increased activity? Will these additional stress levels and other factors from the development of this area make the remaining trees more susceptible to bark beetles? What is the likelihood that some percentage of the remaining trees will die within two years of the development completion due to these factors and what percentage would be projected for this event?

The cumulative affect of all of this is a loss of a large number of old growth trees and this affect cannot be offset by planting new trees. The effects of cutting this string from the intricate web of life would reverberate for decades on our plant and animal life and deeply affect a way of life that the residents have sought out by moving here. What long range effects, for the next several decades, are expected to the residents and to the wildlife from the destruction of these trees? How will these effects be mitigated for now and for the next several decades? How will the cutting of these trees and the resulting changes effect property values of the homes in the immediate area and throughout Fawnskin?

Thank you for your consideration in this matter.

Yours truly,

Erwin Nichols

P.O. Box 434
Big Bear Lake, CA 92315

County of San Bernardino
Planning Division
385 N. Arrowhead Ave 3rd Floor
San Bernardino CA 92415-0182

92415/0182

Joni Allen
24604 Varese Ct.
Valencia, CA 91355-2043

24604 Varese Ct
Valencia, CA 91355

March 17, 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave 3rd floor
San Bernardino, CA 92415-0182

RECEIVED
MAR 2 1 2002

ATTN: Tracy Creason, Sr. Associate Planner
Re: EIR for Moon Camp TT #16136
Cluster Pines - Marina Development

Dear Ms Creason:

Having just closed escrow on a home on Flicker Rd., one that I thought would be my runaway from LA County's over dense building policy, light pollution, traffic problems compounded with exhaust pollution, shorelines polluted from run off, etc., I am now distraught to learn that here we go again. Has San Bernardino learned nothing from L.A's woes? Barely a day goes by that The LA Times doesn't have articles pointing out the problems that come from hi density rapid growth. Only the insular soul could claim ignorance. A few questions come to my mind:

1) How did a state or county camp ground like Cluster Pines change from public usage to one now slated for private enterprise and profit?
2) Can the Big Bear/Fawnskin infrastructure which appears so "small town" support these new real estate developments?
3) Who has studied what 175 more boats on the lake will do to the lake's water pollution problems? Beyond the boats expected, has anyone considered the fuel the new popular sea doos spew out of their exhaust? Is SBC prepared to ban swimming and water skiing so some poor ignorant soul doesn't swallow the polluted water? What will happen to ye olde popular fishing past-time when all we have are dead fish floating belly-up?
4) To make room for more real estate, trees become the natural victim. Environmentally why would anyone want to decrease our air quality? Our forests only help maintain a high standard. What is to happen to our eagles and other water fowl? How have all the attempts to establish wetlands and safe habitats for endangered species in California eluded those in SBC county supporting these two projects?

The proposed EIR is most urgently needed. Fawnskin is pristine and deserves to be preserved. I would appreciate receiving any information re these two projects and results on any studies performed.

Sincerely,

Joni Allen

327 E Lemon Avenue
Arcadia, CA, 91006

Mar. 18, 2002

Ms Tracy Creason
Senior Associate Planner
Advance Planning Division
Land Use Services Dept.
County of San Bernardino
385 N. Arrowhead Ave.
San Bernadino, CA, 92415-0182

Dear Ms Creason:

I applaud the County's decision to do an EIR for the proposed North Shore Drive development in Fawnskin.

The scenic beauty of the Big Bear area is a significant economic asset to San Bernadino County. My concern over the new North Shore Drive development is not driven by ideological, selfish, or NIMBY issues, but from a genuine love and respect for the region and a recognition that, as with many other areas in California, water sets a limit on the sustainable population.

Consequently, the main threat I see is to water supply and quality. At present, our understanding is that Fawnskin has more water than it uses and that Fawnskin supplies the excess to the South Shore communities. So, the supply issue must be addressed in the context of the total present and projected water demands of the Big Bear region. If such a Master Plan has not been done, it should be as a part of the report. What population can the area sustain without environmental degradation? What are the projected water supplies? What are the projected levels of demand, estimated for various amounts of development?

The EIR must allow for worst case drought, not just average rainfall, conditions. If continued, the dry periods of the last few years will put Big Bear Lake at it's depressingly low 1990-1991 levels. Continued development in all parts of the lake region cannot help but make the impact of a major drought much worse.

A limited supply and increased demand is also a threat to water quality. As well as sewage disposal issues at low lake levels, the EIR must consider the environmental effects of increased phosphate loads and hydrocarbon runoff from increased traffic. Are there adequate construction codes to eliminate increased erosion and shore degradation both during and after construction. Estimates of increased sediment loads to the lake are required.

On a separate issue, more development means more litter, and more litter drives away visitors. The economic impact of increased litter should be considered.

Respectfully

Harold S Brown

March 18, 2002

RECEIVED
MAR 19 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave., Third Floor
San Bernardino, Ca 92415-0182

Attn: Tracy Creason, Senior Associate Planner

RE: Environmental Impact Report (EIR) for Moon Camp TT #16136

My husband and I have lived in Fawnskin on and off for the last 25 years. We have at times considered moving to the 'other side of the lake' but always return to beautiful Fawnskin. Unlike the south shore we still have the feel of living in the forest. I'm sure that this is also important to the many that visit our area each year beside those of us that live here. Big Bear Valley has seen too much growth recently and is in danger of becoming overcrowded, if it is not already.

There is currently a shortage of water and new developments should not be allowed when we already have restrictions on our water usage.

Unless you are fortunate enough to live on the lake, North Shore Drive is about the only unobstructed view of the lake that remains. By building more homes along this shore line the view will be lost to us forever.

One of the highlights of winter in Big Bear is the return of the Bald Eagle. I have taken my own 'unofficial eagle count' this winter and found that the majority of eagles are found in and around Moon Camp. By removing 700+ (not including the removal for homes) of the trees we are endangering their habitat. And facing the possibility of the Bald Eagle not returning here again, which would be a tremendous loss to the Big Bear area not to mention the Bald Eagle.

Also, the traffic on North Shore will increase, bringing with it the chance of more accidents. And by straightening this portion of North Shore, speed will increase and with that comes more loss of wildlife due to 'road kill'.

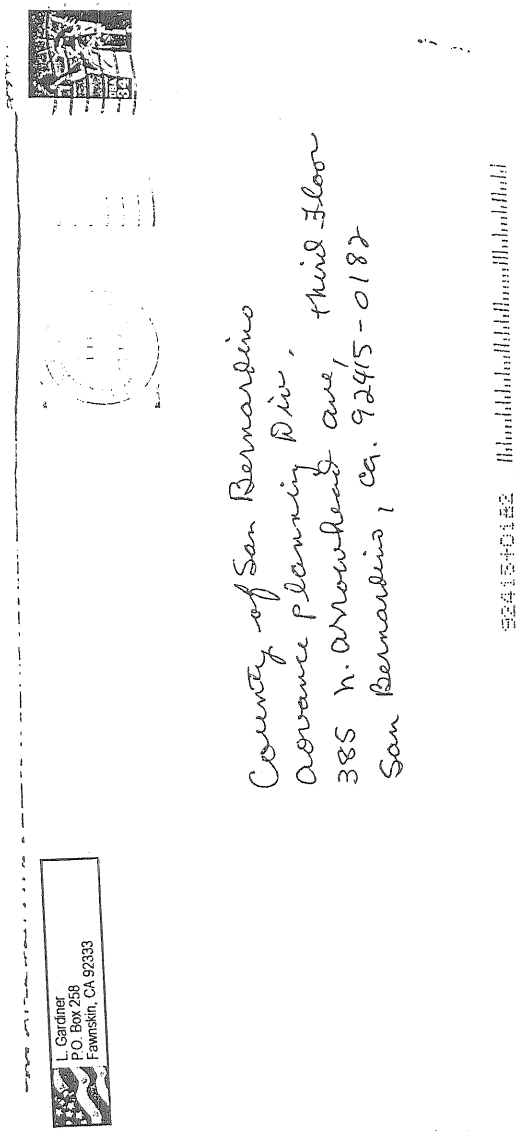
And there is also the removal of endangered plant forms. And the loss of more wildlife habitat. All of which is irreplaceable.

Fawnskin, and all along the north shore, is a special place and I hope that you will help us to keep it that way. **Please don't let RCK Properties and the County *buy* your approval.**

Sincerely,

Colleen Hart

Colleen Hart
P.O. Box 374
Fawnskin, CA 92333



From: echoesofthepast <echoesofthepast@earthlink.net>
To: County of San bernardino <County of San bernardino>; Advance Planning Div. <Advance Planning Div.>
Date: Monday, March 18, 2002 11:29 PM
Subject: EIR for Moon Camp TT#16136

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave, Third Floor
San Bernardino, Ca. 92415-0182

RECEIVED
MAR 19 2002

Attn: Tracy Creason
Senior Associate Planner

Re: File/Index: GPA/TT/m331-8n/01/APN: 0304-091-12*
Applicant: RCK Properties, Inc.

Regarding the above noted proposed general plan/land use district amendment:
Aside from the many concerns listed in my letter to the Planning Division several months ago I want to express my increased opposition to this proposed amendment .

It would be unconscionable to allow a project to be approved that would impact Big Bear Valley for all time in such a negative manner.

From loss of trees, wildlife and endangered plants to the burden on the Fire Dept., Police Dept. and the Hospital and Medical System in place in Big Bear Valley to the impossible increase on all County Services....the impact would be terminal for the life as we now know it in this valley.

I realize that change is inevitable...but changes should be made slowly enough to insure that we don't destroy the natural beauty of this valley.

Developers should not be allowed to change this area for money and only money....it is not in the best interest of Fawnskin or Big Bear Valley to allow this over-development to be approved.

It is obvious that these changes would benefit San Bernardino County by increased income from Property taxes, etc...but the General Plan was developed to provide a safe guard against overbuilding...and this intention should be observed for the greater good of the citizens of this Valley.

Sincerely,
Loretta L. Gardiner
P O Box 258
(40050 North Shore Dr)
Fawnskin, Ca. 92333
Loretta L. Gardiner

TO: 909.387.3223
San Bernardino County
Planning Division

ATTN: TRACY CREASON
Advanced Planning

FROM: Steven Stoll
Yale University

MAR-20-2002 09:01 AM STOL9.719.9M4COMPANY 19497199664 P.02

Yale University

Department of History
P.O. Box 208324
New Haven, Connecticut 06520-8324

Campus address:
240 Hall of Graduate Studies
320 York Street
Telephone: 203 432-1366
Fax: 203 432 7587

March 18, 2002

To the Editor:

We've seen it before. A developer comes to a tucked away place and buys land, offering homes for people who want repose from the stress of freeway living. The developer claims that the local economy will flourish; residents claim that their quality of life will whither. County government supports the plan for no other reason than that it promises to increase the number of people paying taxes. Politicians can claim that they created jobs and paid for essential services, the supposed blessings of growth.

Though frustrated residents write and protest, the project goes through, but that's never the end of it. The people who come to live in the new condos never know what the old town looked like. Habitat is destroyed, wildlife becomes scarce, roads are enlarged, traffic is faster, and there is more noise to distract from what was once the reason for living in the town--its isolation from the world of the freeway.

This is a story of twentieth-century California, replicated over and over again from San Diego to Marin County. For anyone who grew up in the state, "development" means that people with no regard for a place somehow gain the power to utterly change it. It also means that local people, lured by the empty prospect of jobs and a stronger economy, will give up control over their open spaces and fresh air. It's been a long time coming, but the same mindless machine has finally come to Fawnskin.

I first saw Big Bear Lake at the age of six, when my grandparents built a cabin at the top of Flicker Road. Visiting there taught me the diversity of life, showed me cycles and creatures. We had no idea that anyone else knew about the place or that so many people would build right next door.

If the process follows a typical pattern residents will have one hearing to make their arguments. Residents should ask the County Supervisors how needed services will be paid for, how water will be provided to an increased population when the next drought comes, and why they would want to destroy the scenic value of the lakeshore. Ask them why short-term gain should be favored over the long-term health of the lakeshore. Ask them why the idea of local control--a sacred Republican principle--is so often ignored when people want to stop growth and development.

Yet these questions speak to the hardened economic interests of the County Supervisors. They won't satisfy the forlorn residents, many of whom might want to ask that the County stop the mindless machine before it rolls over a valley poised improbably between the coastal plain and the big empty of the Great Basin, where Jeffrey pine and prickly pear meet in an elegant transition between major ecosystems. The people of Fawnskin must feel just as delicate--like they also stand between opposing forces.

Steven Stoll
Yale University Steven Stoll

[The author is an assistant professor of History at Yale University and the author of Larding the Lean Earth: Soil and Society in Nineteenth Century America (2002)]

COUNTY FIRE DEPARTMENT

HAZARDOUS MATERIALS DIVISION
EMERGENCY RESPONSE/ENFORCEMENT
385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153
(909) 387-4631 • Fax (909) 387-4323

COUNTY OF SAN BERNARDINO
ECONOMIC DEVELOPMENT
AND PUBLIC SERVICES GROUP

PETER R. HILLS
Fire Chief
County Fire Warden

18 March 2002

San Bernardino County Land Use Services
Advance Planning Division
385 North Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182

ATTENTION: TRACY CREASON, SENIOR ASSOCIATE PLANNER

RE: NOTICE OF PREPARATION OF ENVIRONMENTAL IMPACT REPORT FOR RCK PROPERTIES, INC APPLICATION FOR TENTATIVE TRACT MAP 16136, A GENERAL PLAN ANENDMENT/OFFICIAL LAND USE DISTRICT CHANGE, AND A CONDITIONAL USE PERMIT ON APPROXIMATELY 62 ACRES LOCATED IN THE UNINCORPORATED COMMUNITY OF FAWNSKIN

The San Bernardino County Fire Department, Hazardous Materials Division has reviewed the Environmental Checklist form (Initial Study) for the above-mentioned project. While this Division responded to a Project Notice for Tentative Track No. 16136 with a response of "No hazardous materials conditions apply to this project", the project description has changed slightly since the initial notice was received, therefore possibly requiring a different set of conditions for this project.

This letter will serve as notice to RCK Properties, Inc. that hazardous materials requirements and permits may apply to this project. If the construction project or resulting facility handles hazardous materials in quantities of 55 gallons, 500 pounds, 200 cubic feet, or any amount of hazardous wastes, the owner or operator may be required to file a business emergency/contingency plan prior to final certificate of occupancy. Additional plan check and permits may be required if hazardous materials are stored in underground tanks or aboveground tanks or if specifically listed regulated substances are handled above threshold quantities.

For further information, please contact me at (909) 387-4631.

Kristen Riegel

KRISTEN RIEGEL, MPH, REHS
Business Plan Program

Mr. Marvin Cira
PO Box 393
Big Bear City, CA 92314-0393

County of San Bernadino
Advance Planning Division
385 N. Arrowhead Ave. 3rd Floor
San Bernadino, CA 92415-0182

Attn: Tracy Creasom

RECEIVED 5/18/02

County of S.B.
Advance Planning Division
385 N. Arrowhead Ave, 3rd Fl.
San Bernadino, CA 92415-0182

Attn: Tracy Creason, Sr. Asso. Planner

Ref. EIR for Moon Camp TT #16136

My wife and I are retired teachers from Burbank, CA. Six years ago as we terminated our employment, we searched for a retirement area that was clean, friendly, environmentally positive, and not over crowded as we had lived in the San Fernando Valley.

Big Bear Valley was our choice and has met all our expections. We are thrilled living in this pristine environment.

To keep this area in its lovely state, we all need to be cognizant of potential damage to our area, and we need to be actively involved in its protection.

For this reason I urge you and your comissim to reject the proposal to dramatically alter the environment in Fawnskin.

This is a fragile place. We

page 2

Excessive vehicular activity could cause smog, and damage our crystal clear air. The roads in and out of Fawnskin are narrow and winding. We frequently hike in that area, and Eagle watch. With so many housing units planned, the roads would be continually clogged or would need to be significantly enlarged. Either optin is untenable to us.

We don't want Big Bear Valley to morph into another Los Angeles. We moved here to avoid such an impacted area.

Please, this is very important to us, reject the plan to desecrate the beauty of Fawnskin with the development of the Moon Camp plan. To us it clearly desecrates the beauty of this pristine valley and could have a huge enviromental impact on this mountain hamlet.

Sincerely,

Marvin Cira
40020 Water Hole Ln.
PoBox 393
Big Bear City, CA 9231[illegible]

Susan Mershon Brockert
P. O. Box 133116, Big Bear Lake, CA 92315
(909) 584-7854 TurqLady@aol.com

RECEIVED
MAR 20 2002

March 18, 2002

San Bernardino County
Advanced Planning Division
385 Arrowhead Avenue
Third Floor
San Bernardino, CA 92415-0182

Attn: Tracy Creason
Re: Project TT#16136

We are writing you concerning the Moon Camp Project in Fawnskin, California.

The development of that stretch of lakeshore is one of the most poorly conceived we have ever encountered. Here's why:

1. Re-routing the road will do untold damage to the natural drainage system of the mountain to the lake.
2. Air, water and light pollution pose a serious threat to this beautiful, and so far natural, area.
3. We do not need another marina!
4. Have you seen our lake level at present? It is down over 10'.
5. This area is an eagle habitat. The number of eagles that visit Big Bear Valley is diminishing each year. There is very little area left for them.
6. The number of trees that would be cut down is absolutely unacceptable.
7. Our beautiful view of Big Bear Lake and our mountains will be spoiled FOREVER.

When so many counties are working hard to become educated and to initiate projects to save and improve our environment, we are sorry to live in San Bernardino County. We are not just asking you to postpone this project; we are asking you to sack it.

Let's be a pioneer in the area of environmental conservation and show the whole world that we value our county, state, country and planet more than we value the money to be made by the development of Moon Camp.

Sorrowfully yours,

Susan Brockert Philip M Brockert

Susan Mershon Brockert Philip M. Brockert

RECEIVED
MAR 2 0 2002

Paul & Joan Schuh
PO Box 237
39711 Flicker Road
Fawnskin, CA 92333

March 18, 2002

County of San Bernardino, Advance Planning Division
Attention: Tracy Creason, Senior Associate Planner
385 N. Arrowhead Ave., 3rd Floor
San Bernardino, CA 92415-0182

Re: ENVIRONMENTAL IMPACT REPORT (EIR) FOR MOON CAMP TT#16136

Dear Tracy:

My wife and I moved to Fawnskin in July 1998 from Camarillo in Ventura County. We lived in Camarillo for 20 years during which time it grew from a small town of 30,000 people to a city of 75,000. The small town environment, few traffic lights, light traffic, good schools for our children, etc.; all the qualities we cherished were obliterated by the development which took place over that 20 year period. We moved to Fawnskin because it was small, quiet, and peaceful. A superb place to retire and enjoy the outdoors, and the exquisite mountain scenery. The development of Moon Camp (62 acres), Marina Point (12 acres), north of Brookside (73 acres), and west of Canyon (38 acres) will more than double the population of Fawnskin. Based on the rapid rate of development in the valley just since we moved here, I would expect Fawnskin to be built-out in 5 to 10 years. Many trees will be removed to develop the home sites, roads built & realigned, wildlife & plant habitat destroyed, traffic will increase, air pollution from cars & fireplaces, water & electrical supplies will be strained. The quality of life in Fawnskin will suffer and all we cherish degraded. We will sell our home and move again - to another small, quiet and peaceful community, this time far away from California. We sincerely wish it wasn't this way. We write letters to our political reps and support their reelection campaigns. We plead with them to exercise restraint, to curb the greed, and respect nature the land & it's resources - but the developers give more money and buy the votes they need to continue developing until the air is unhealthy, the land covered with homes & pavement, and the wildlife is driven out.

I firmly believe that the proposed Moon Camp development will have a singularly significant impact on the environment. However, Moon Camp is not the only eminent development in the area and when it's EIR is completed, a cumulative EIR should be done before any individual development (such as, Moon Camp) is approved. At the very least, the cumulative impact of Marina Point and Moon Camp should be addressed.

Areas of greatest concern to my wife and I are: air & water quality, cost of utilities, destruction of the natural scenery, destruction of wildlife & plant habitat, increased traffic congestion, closing of wildlife corridors to the lake, restricting lake access for residents & visitors, destruction of eagle perches, traffic noise, future water availability, future electricity availability, light pollution, and overall degradation to our current quality of life.

Following is a list of questions and analyses which we believe should be addressed in the EIR.

AESTHETICS. Use large scale photographic and computer simulation techniques to illustrate the change to existing scenic vistas, damage to scenic resources, and degradation of the existing visual character of the site and its surroundings. Use current good practice criteria or establish criteria to estimate the actual number of trees that will be removed to make way for homesite development and actual building of homes on the individual lots. Use this same criteria to establish the amount of roofed and paved area expected to result at buildout. Express these values in a manner which clearly illustrates the density of the development.

AIR QUALITY. Establish current levels of air pollution in the Fawnskin area. Identify the sources, types and amount of pollutants that will be released to the environment when Moon Camp is built-out. Determine both the quantitative and qualitative impact on the air quality. Will the additional pollutants impact the visibility of objects at a distance or how far one can see? If so using the current worst case days during the year, how much would visibility be reduced? How would this increased air pollution effect the health of full-time valley residents?

BIOLOGICAL RESOURCES. How many Bald Eagles perch in the area? How many Deer migrate through the area to obtain water or food? What is the corridor that the Deer use and are there alternate corridors available? When Moon Camp is built-out will the Deer be driven from the area?

HYDROLOGY / WATER QUALITY. Determine and graphically depict the watersheds and aquifer(s) from which Fawnskin currently obtains water. How much water is available to the area and what are the current monthly demand/usage profiles? How much additional water demand/usage will be needed to supply the Moon Camp development when built-out? Where will this water come from? Is there an adequate supply for Moon Camp and other already approved development (e.g., Marina Point)? How much water is in the existing aquifer(s)? If there is more than one aquifer are they known to be completely isolated from each other? Are the aquifer(s) isolated from the lake or does lake water seep into the aquifer(s)? What is the depth of existing wells which supply water to Fawnskin? Where are the existing wells located? Will new wells be required to supply water to the Moon Camp development? Where will these wells be located? Have test wells been drilled for Moon Camp? If so, how deep where they drilled and what was their yield? Explain how inspite of the fact that the entire valley has been under water restrictions for many years, there is always plenty of water to supply new developments in the valley. How will the current residence wells adjoining Moon Camp be effected? Will those wells have to be drilled deeper to maintain an adequate water supply?

LAND USE / PLANNING. Moon Camp is expected to have a much higher housing density than is typical eastern portion of Fawnskin. The is a natural fallout of the high prices these lots are expected to bring by the real estate community. Using best practice criteria estimate the size of houses that will be built on the individual lots and compare the density of the Moon Camp area to the house density of the lots in the eastern half of Fawnskin.

NOISE. Determine existing noise levels at various sites adjacent and adjoining the Moon Camp Site and estimate increased noise levels once the area is built-out. How much noise will result during construction? How much noise will result from increased traffic levels? Relocation of SR38 further north will likely increase road noise at the homes on Flicker Road which overlook the Moon Camp area. What is the current noise level on the decks of these homes and how much will the noise level increase as a result of the trees being removed and SR38 being moved closer?

POPULATION / HOUSING. As noted in the Initial Study Environmental Checklist Form the Moon Camp development will significantly increase the population of Fawnskin. How will this impact the local Fire Station? Will additional personnel and equipment be required? Will the Fire Station have to be expanded or another station constructed? What will be the impact on the Fawnskin Post Office? Fawnskin does not have mail delivery service and permanent residents are provided with a Post Office Box free of charge. Will the Post Office need additional boxes to serve the increased population? Will the Post Office have to be expanded to serve the increased population? How will these additional facilities be paid for? Who will do the paying?

RECREATION. Big Bear Lake is a public lake and the Moon Camp development proposes a gated community on the lakeside of SR38 with a 100 slip marina for the exclusive use of property owners. This proposal effectively locks out the public, making lake access impossible. How does the developer plan to provide public access to the lake? How much parking will be provided at the access point(s)?

TRANSPORTATION / TRAFFIC. Traffic is expected to increase significantly and delay times will be adversely impacted at major highway intersections. What mitigation measures are recommended to deal with this situation? How much will they cost and who will pay for them?

UTILITIES / SERVICE SYSTEMS. How much water and electricity will the Moon Camp development require on buildout? Is the current water and electricity supply adequate to supply Moon Camp? Where will the water come from to supply Moon Camp? Will the development and buildout of Moon Camp ultimately result in slow depletion of the aquifer(s) supplying water to Fawnskin? Can the water purveyor guarantee that the currently approved Marina Point development combined with the Moon Camp development will not slowly deplete the water supply? Bear Valley Electric has been trying for over 10 years to increase the power transmission capacity to the valley without success. With all the current development underway will there be adequate electrical power capacity to serve the Moon Camp development?

Sincerely,

Paul Schuh

Joan Schuh

Joseph & Barbara Francuz
817 Coronado Terrace
Los Angeles, CA. 90026
March 18, 2002

San Bernardino County Land Use Services Department/ Planning Division
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA. 92415-0182

Via Fax (909) 387-3249, (909) 387-3223 and USMail

Attn: Tracy Creason
Senior Associate Planner

Reference: Applicant-RCK Properties
Tentative Tract Map 16136

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As homeowners at 39787 Flicker Road, Fawnskin, we write to you to express our disagreement of the proposed project referenced above.

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1. How will this project negatively impact vital wildlife and plant habitat? Endangered species include the Bald Eagle, Kennedy's Buckwheat and the Ashgray Paintbrush, plus many other plants and animals not on the endangered species list, but listed on the California Environmental Quality Act.

2. Regarding the 100 boat marina, the dredging would be very harmful to the Bald Eagle population, which winter in the area. An additional concern is another 75 boat slips proposed at the Cluster Pines (Marina Point) development. The cumulative effects of these projects must be addressed in the EIR.

3. Lakeshore access would be unavailable to the public with the building of lakefront homes and the marina. Tourism will be negatively affected because of this privatization of the shoreline. What is the cumulative effect to the public?

4. The felling of 750 trees is totally unacceptable to refigure North Shore Boulevard. Older growth trees take one hundred years or more to replace. How many additional trees would be felled to build homes in the area?

5. Realignment of North Shore Drive could not begin to handle the increase of traffic that your records show will increase from 300 to 900 trips per day. The small community of Fawnskin cannot handle the congestion caused by the addition of these homes and marina, as well as the increased noise and pollution from the additional cars and boats. City density standards should not be used in this rural community. How will the proposed developments, including Marina Point, Brookside Road and the new Zoo, effect traffic on the North Shore?

6. Big Bear Lake's water quality would be severely affected by the runoff from such a development. This includes petrochemical emissions from additional automobiles and boats, as well as pesticides used at the 95 homes and sediment runoff. In addition, Cluster Pines (Marina Point), is planned to have 133 condominiums. What are the effects of both developments' on the lake's water quality?

7. There is insufficient water to support additional residences in the Fawnskin area. There is a water shortage currently, this project would only worsen the existing condition. There would be insufficient water for firefighting as well. Consider all developments (Moon Camp, Cluster Pines and Brookside Road) proposed when you compute the water usage.

8. Our sewage treatment plant is running at full volume currently. We do not have the sewage capacity to support this development. Some homes today have sewer gas problems from overloads at the density that presently exists, and nothing has been done to alleviate these problems. Can our sewer system handle all that will be asked of it?

9. 92+ chimneys pumping smoke would severely impact the air quality in Big Bear Valley because of the inversion layer that exists here in the winter. In addition, please consider the Cluster Pines (Marina Point) development proposed 133 condos, as well as the Brookside Road development. Please analyze the cumulative affects of the air pollution caused from the total proposed developments, including chimney emissions, cars (both cold starts and idling), 100 boat emissions of Moon Camp, as well as the 75 boat slips planned for Cluster Pines (Marina Point).

10. Big Bear Valley cannot support the additional children for schooling brought in by the addition of these proposed homes. Please analyze the impact on the school system taking into consideration all of the proposed developments in the area.

11. The building of homes in the proposed area would be inconsistent with the mountain character of Fawnskin and would be an eyesore from both the north and south shores of the lake. The addition of several hundred more people in the Fawnskin area would stress the environment of the adjacent forestland. Consistent with the surroundings, the RL-40 zoning should be adhered to for the sake of the environment. How would this addition, as well as the other proposed developments, affect the quality of the environment?

12. The addition of these developments and marinas would pollute the night sky with too much light. What will be the cumulative affect on the intensity of the nighttime sky?

13. The existence of the larger plots of land means that in the future, these plots could be subdivided into 7,200 square foot lots, therefore adding even more homes to the area. How will this additionally impact all of the items mentioned above? What guarantees are there that the larger plots could not be subdivided into the proposed 7,200 square foot lots?

14. How will the addition of the proposed developments cumulatively affect our already limited medical facilities, including ambulance service?

15. Please consider the effect of seismic activity specific in the area. A fault runs through Windy Point on the north shore of Big Bear Lake. What will be the effect in regards to earthquakes and seismic activity, as well as the emergency personnel and equipment available in such an instance?

16. How will these developments cumulatively increase the need for additional firefighting and sheriff services?

17. The developers of record have a negative track record adhering to mitigation terms set up to protect areas developed. What guarantees would we have that this project would be mitigated honestly and for the benefit of both the environment and community?

18. The cumulative effect of developments at Moon Camp, Cluster Pines (Marina Point), Brookside Road, Deer Trail Road and the new Zoo with the existing environment must be assessed collectively with regard to all issues. City development standards should not be applied in this mountain community. Mitigation should be site-specific to Fawnskin and the North Shore, not based on a model.

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Respectfully submitted,

Joseph L. Francuz

Barbara Francuz

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Anne Browning McIntosh, AICP
220 Highland Place
Monrovia, CA 91016

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Advance Planning Division
385 N. Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182
Attention: Tracy Creason, Senior Associate Planner

EIR – TT#16136 Moon Camp

March 18, 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Avenue, Third Floor
San Bernardino, CA 92415-0182
Attention: Tracy Creason, Senior Associate Planner

Subject: **Environmental Impact Report - Moon Camp Tentative Tract #16136**

Dear Ms. Creason:

I am a property owner at 1053 Bruin Trail, Fawnskin. My mailing address is:

220 Highland Place
Monrovia, CA 91016

Following are the issues that have the potential of a **significant impact** on the environment from this project and should, therefore, be evaluated in the EIR.

Aesthetics

1. Scenic vistas. North Shore Drive is a public right-of-way that currently has a scenic vista at this location. What will be done in this project to maintain scenic vistas from the public right-of-way?
2. Degradation of the visual character of the site and its surroundings. This site is in a natural state with many mature trees. How will this project incorporate the rich natural qualities of the site?
3. Light and glare. There are numerous examples of large-scale developments around the lake that have not been constructed with sensitivity to the natural surroundings. What will be done in this project to prevent glare from the sun, e.g. off of glazed surfaces, during the day? What will be done to limit street-type lighting and property lighting so that the residents of Fawnskin are not adversely impacted by lighting during dark hours?

Air Quality

4. Air quality plan. How will this project meet the requirements of the County's required air quality plan?
5. What measures – that do not rely on the use of the already low water supply – will be taken to mitigate particulates in the air during construction?
6. What will be the impact of increased automobile traffic, recreational vehicle usage and use of fireplaces on the air quality of Big Bear Lake?
7. What impact will increased air pollution have on animal and plant life in Big Bear Valley?

Biological Resources

8. Riparian and migratory habitat modifications. What impacts will this project have on the habitats of eagles, herons, hawks? What mitigations measures would be implemented to eliminate the impact of the project on these and other wildlife habitats? Can these habitats thrive with a more minimally developed site?

9. Preservation policies. What preservation policies does the County have in place that will regulate this site? Does this plan conform to any and all requirements of the County of San Bernardino regarding resource preservation?
10. County general plan. Does this project conform to the goals, objectives, policies and programs of the County's open space and conservation elements? Which aspects of this project are supported by the County's general plan?

Cultural Resources

11. What is known about the archeology of this site? Has it ever been researched? Has it been previously developed? What types of uses have existed on this property in the past?

Geology

12. Seismic Safety. Are there any known faults near this site? If so, what are the potential seismic safety risks here?
13. Soils. Is this land natural or is it landfill? What are the risks on this site for ground failure and liquefaction? What would be done to the soils to ensure that liquefaction and ground failure would not occur in the event of a major seismic event?

Hazards

14. Emergency response. I have heard that this project is to be secured or "gated." What impact would that have on emergency vehicles accessing the site?
15. Wildland Fires. How will this project maintain the natural setting and at the same time maintain defensible space around structures to prevent the cause or spread of wildland fires? Is the fire department adequately staffed and equipped to handle a fire emergency in the project?

Water and Hydrology

16. Water usage. What impact will the construction and development of this site, as proposed, have on the water supply in this water district? How might this impact be mitigated by reducing the density and overall square footage of this project?
17. Drainage. Where will the wastewater from this project go?
18. Pollutants. What risks are there to the quality of the water in the Valley during construction? What risks are there to water quality on an ongoing basis?
19. Flooding potential. Is this site in a flood zone?

Land Use and the Fawnskin Community

20. Division in an established community. CEQA specifically requires that you evaluate whether or not the project would "physically divide an established community." The site design, proposed architecture, construction materials, home size, required parking spaces, marina features, and EVERY PHYSICAL CHARACTERISTIC of this project must be evaluated relative to this question. Fawnskin, is most definitely an established community. There are few, if any gates, around private properties. The character of this village rests in its natural, organic setting. If this site is developed, it should be done so in a manner that reflects this region. There are numerous recent individual homes that have been built that have fit in well with the existing community. Please analyze what mitigation measures would be required to ensure that this project does not physically divide Fawnskin.

21. General Plan. This project requires a discretionary general plan amendment. There is no legal requirement that the County approve such an amendment. Therefore, this project should be identified as being in conflict with the adopted general plan.
22. Density. How will this project be consistent with current densities – both number of units per acre as well as total square footage and lot coverage per acre - for the area? How can the project be mitigated so that it conforms to existing densities by all of these definitions?

Noise

23. Noise levels. How will the project conform to the County's Noise Element? When was the noise element last updated? Does it meet the current requirements of the State of California regarding noise? How will noise impacts from automobiles, recreational vehicles, construction, etc. be mitigated?

Population and Housing

24. Housing. Does the County have a Housing Element? Does it comply with State Law? Will the homes in this development be affordable to area residents?

Public Services

25. Park and open space. There is already a shortage of public parkland and open space in this area. What impact will the additional population have on public parks and open space? Will a public park be included as part of this project?

Recreation

26. Lake. I'm not sure who handles lake usage, but there will be increased use by water vehicles. What are the impacts on recreation of a 100-slip marina? What possible impacts could this have on pollution of the lake?

Transportation/Traffic

27. Local traffic. How many access points would there be to this development? How would ingress and egress be managed to maintain vehicular safety on the road?
28. Safety for pedestrians, cyclists. Additional traffic from this site could have impacts on the safety of pedestrians and cyclists. Many families walk and cycle in this area for recreation.

Waste Management

29. Will this be sewer or septic?
30. What impact will this have on refuse facilities and landfills?

Alternative Projects

Please evaluate the following as alternative projects:

- Purchase of land by Forest Service at current land value pursuant to the CURRENT general plan designation.

- Projects under current general plan designation and zoning. Please provide an exhaustive list of the variety of projects that can occur on the site currently – campsites, low-density residential, etc.

- Reduced project size – greatly reduced density, variety of home sizes, large setbacks, no gates, no tree removal, no curbs, gutters, minimal paving, street lights, no turf or landscape materials installed by developer, inclusion of one or more public amenities (such as a public open space or park area), scenic view protection. This should be prepared by a professional planner or architect with experience in the area of site planning and design and a knowledge of appropriate development in mountain and/or wilderness areas.

Project management

The County does not have a local planning office. How would the County ensure daily project management? How would a mitigation-monitoring plan be enforced? Would a County employee be required to be on the site on a daily basis? If not, how would conditions be enforced?

Legal requirements and exactions

Unless I have been misinformed about the facts, the County is under no legal obligation to amend its general plan to accommodate this project. Therefore, I believe that the environmental analysis should be thorough and should emphasize both the immediate as well as cumulative impacts of this project as proposed. Further, the EIR should be the basis for a discussion about a reduced project that would mitigate ALL environmental impacts to a level of insignificance. Finally, any and all exactions that are necessary to compensate for environmental impacts should be required as part of the mitigation monitoring plan. In-lieu fees should be required prior to permit issuance and placed in an escrow account until the project is completed according to all terms and conditions in any and all entitlements as well as the mitigation-monitoring plan.

Thank you for your thorough attention to this important issue.

Sincerely,

Anne Browning McIntosh, AICP
220 Highland Place
Monrovia, CA 91016

March 18, 2002

RECEIVED
MAR 2 1 2002

Deb Hagan/Leslie Evers
997 Chinook Road
Fawnskin, CA 92333

Tracy Creason, Senior Associate Planner
County of San Bernardino
Advance Planning Division
385 N. Arrowhead Drive, 3rd Floor
San Bernardino, CA 92415-0182

re: Environmental Impact Report (EIR) for Moon Camp TT#16136

Tracy:

There are two proposed developments of immediate concern: 1) MOON CAMP: RCK Properties proposes changing the zoning from 1 home on 40 acres to 92 homes on 64 acres of now open land(east of Canyon Road on North Shore), with a gated community on the lake front and a 100-slip private marina and 2) CLUSTER PINES (Marina Point Development): Proposes 132 condos on 12.5 acres of currently undeveloped lake front land with a 75-slip marina.

Both developments are of immediate concern due to the obstruction of public lake access and views from the highway, the number and density of units proposed, the proposed major realignment of the highway, traffic issues, air pollution, the large number of trees to be removed, destruction of the eagle and endangered plant habitat areas, light pollution and an overload on community resources such as water and sewer.

What follows are some questions that I have regarding the analysis of the Environmental Impact Report. I look forward to your response.

1. At what rate will the air quality be affected by the increase in emissions due to the increased number of cars traveling at slower speeds caused by the increased traffic congestion, increased emissions form fireplaces and wood burning stoves, as well as boat engines, ATV's, leaf blowers, and recreational vehicles, and cumulative air pollution from this and all projects around the valley, including during the construction phase?

2. How will the water be affected by the additional runoff to the lake from an increase in fertilizer, etc?

3. There is already a shortage of water and we are in drought conditions. What measures are going to be taken to ensure a sufficient quantity and quality of water for not just drinking but in the event of a fire?

4. Local energy suppliers state that no more power lines can be added nor no more solar power can be used. As we are already experiencing a shortage, how will the power supply be enhanced to accommodate the increased demand?

5. There are already sewer odors in some homes due to being overloaded as well as manholes that have been repaved without being raised. What are the cumulative effects of the additional developments being added to the current sewer lines? Are the pipes in Fawnskin able to handle the additional volume?

6. A tremendous number of trees need to be removed not to mention the ones that will be killed by the sheer stress of the construction. Planting lots of replacement tress will not begin to make up for the loss of trees that are hundreds of years old. What can be done to minimize the destruction of these trees?

7. This area is a habitat for eagles, blue herons, ospreys, hawks, deer, coyote as well as many plant life only found in the Big Bear area. What are the statistics on the effects of construction to these types of animals? What research has been done on other communities developed in like areas?

8. What happens in the event of medical, fire and earthquake emergencies? Our current resources barely handle the present population.

9. Are the survey time frames adequate for an accurate biological assessment? Due to the seasonal changes and migration patterns, anything less than a year is inadequate.

10. How long will it take me to get from Fawnskin back down to the bottom of the hill due to the potential cumulative effects of holiday and weekend traffic?

11. With the increase in gated/private communities will Big Bear turn into an area like Arrowhead with no public access to the lake?

12. Will property values of houses not on the lake decrease due to decreased visibility of the lake from the scenic highway and other areas? Additionally, will the "high density" housing development have an effect on property values? If so, what?

13. Will there be additional classrooms built and teachers hired to accommodate the increase in students?

14. What are the short and long term effects of the increased noise pollution?

15. Will the quality of life decrease with the increase in population? This judgement should be made with comparisons to non-urban areas. City development standards are not appropriate.

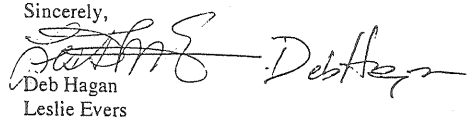
16. The County already has a terrible record for not enforcing mitigation terms and conditions. What measure would be taken to change this?

17. Why not explore alternative land uses? Suggestion: expand the National Forest lands as an alternative to proposed rezoning.

18. What are the cumulative effects to increasing the population in the proposed areas?

As a property owner in Fawnskin I know that I will be directly affected by the out come of your decisions. With that said, I am not necessarily against the development of some of the area, as long as it has been thoroughly thought through. Please send your response to: PO Box 1595, Beverly Hills, CA 90213.

Sincerely,



Deb Hagan
Leslie Evers

PAUL H. LASKY

P.O. BOX 310 • FAWNSKIN, CA 92333-0310
PHONE (909) 866 6526• FAX (909) 866 8723

March 18, 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave. – 3rd Floor
San Bernardino, CA 92415-0182

Attn: Tracy Creason, Senior Associate Planner

Re: Environmental Impact Report (EIR) for Moon Camp TT #16136

These are the issues and concerns that must be addressed in the Moon Camp EIR:

Air Quality

How much will the NOx , CO and CO2 and particulates concentrations in the air in the Fawnskin area be increased by the greater number of automobiles and trucks in the area? The study must include the effect of slower speeds of vehicles caused by increased traffic flow.

How much will air pollutants be increased due the increased emissions from the greater number of fireplaces and wood burning stoves, boat engines, ATVs, leaf blowers, and other recreational vehicles?

The increase in pollutants should be estimated during the construction phase of the project and separately for the period following construction and occupation of the proposed homes.

Water Quality

How much polluted runoff in terms of 1000's cubic feet per year into the lake over the newly developed areas? What will be contaminants of this runoff over newly landscaped and fertilized areas? How much additional pollution of Big Bear Lake will be produced from this runoff over the proposed development area?

Water Availability

Assess the effect on wild land Fire suppression efforts due to the draining of the natural water table from the proposed development. Determine the increased amount of ground water required and the cost of producing it, treating it, distributing it, and storing it for the proposed increased population of Fawnskin. Determine the effect on the Forest and natural vegetation of the pumping of the ground water necessary for the proposed project.

Energy Impact

Determine the feasibility of using the present electrical distribution system to provide the increased energy needs of Fawnskin fostered by the proposed project. Determine the amount of increased KWH of electrical power and the capital cost of providing the necessary beefed-up distribution grid. What would be the effect on the natural forest and vegetation of newly constructed underground electrical conduits and electrical vaults? What would be the effect on the scenic views of the lake due to increased electrical lines strung from poles? Will increased power use due to the proposed project from the present electrical transmission system cause increased maintenance cost and/or brown/black-outs?

Sewers

Does the present sewer system have enough additional capacity to serve the increased needs caused by the proposed project? Will odors and sewer overflows be expected due to the increased load on the present system? What will be the actual cost of increasing the capacity of the present system to serve the increased needs fostered by the proposed project?

Trees

How many additional trees must removed to clear the sites for construction of the homes and for the additional planned roads and planned re-routing of the highway? How many additional trees will die due to stress from the construction, increased air pollution, and draining the water table to provide water needs for the proposed project?

Is it feasible to require the developer to replace the trees with comparable sized old growth trees to replace the many trees that must be destroyed? What will be the effect on the scenic views and general Forest nature of the area due to the destruction of the native plants and trees?

Eagle Habitat

Currently Eagles nest in trees over a wide area in the lands encompassed by the proposed project. Is it feasible to preserve the habitat by saving a few trees for the Eagles to nest in? Or is it necessary to preserve the Eagle habitat to save a majority of the large trees due to the nature of Eagles requiring nesting sites remotely distanced from other nesting sites? Will the Eagles nest in newly planted trees? Will the mere presence of 92 additional proposed homes and all the people that will occupy these homes with the attendant noise, and traffic cause Eagles to abandon the present preserve? What is the estimate of the total effect of the development on the Eagle population in the area?

Wildlife Habitat

What will be the effect of the increased traffic, noise, and development of the area on the habitat of each the present birds species that occupy the area including, Blue Herons, Ospreys, Hawks, and Waterfowl? Estimate the effect on the population of each of these species. Address the habitat changes effect on the present population of each of the following mammals that presently occupy the area: raccoon, beavers, deer, bear, coyote, mountain lions, and bobcats. What would be the effect on the seasonal and year-around population of each of these species?

Fire Protection

What will be required to beef up the fire department to prevent another "Oakland Fire" in the newly developed urban area in the middle of a dry forest? Would the increased population and development present the conditions for another "Oakland" firestorm in the middle of a dry Forest tinderbox? Will future droughts cause the Forest area to be so dry as to threaten the new development and other local areas with a potential firestorm condition? What will be the cost of the increased fire prevention needs?

Plant Habitat

Assess the possible destruction of rare and endangered plants in the area caused by the proposed project. Determine if any destroyed plant species could be replanted or grown on remaining vacant property in the area. What would be the effect on native plant species from increased irrigation on the developed properties? What would be the effect on native plant species from draining the existing ground water to provide water to the new homes and other buildings planned for the development? What would be the environmental effect on the forest areas from the effect of the approximately 92 new homes importing non-native plants into the area? (Plant pollution). Would the destruction of the native plants in the area cause increased water runoff and soil erosion? What would be the cost to prevent soil erosion?

Traffic

What will be the increase vehicular traffic through the area due to the proposed project? Is the present lakeside road providing access to Fawnskin adequate to handle the increased traffic in Fawnskin, or will the project require either widening of the roads coming into the area? Will the increased traffic engendered by the proposed project be adequately handled by Highway 330, or the other two highways feeding the Big Bear Valley? Must the shoreline highway be widened to a full four lanes to handle the new local and through traffic in the Fawnskin area?

Economic Effects

What will be economic effect on the local tourist trade due to the destruction of the current lakeside scenic highway? What will be the economic effect on the local tourist-vacation industry due to the urbanization of the area caused by the proposed project?

Noise

Measure the increase the area background decibel level caused by the increase in traffic and human activity. What will be the economic effect on the local tourist industry due to the destruction of the current level of natural Forest quiet?

Rural Ambiance

Will the current rural character of Fawnskin be changed forever by the proposed project? Would the rural mountain character of the area be transformed into a typical urban area? What will be the dollar economic impact on the local tourist-vacation industry due to the change of the area's character?

Mitigation Concerns

Assess the developer's record of adhering to mitigation terms and protecting areas developed. What will be required of the County to enforce mitigation terms. What would Mitigation be required? How would Mitigation requirements be accomplished, and at what cost? How would Mitigation terms be enforced? Is it feasible to enforce or trust this developer with voluntarily adhering to mitigation terms?

EIR Comparison with Alternative to Requested Rezoning.

A viable alternative to granting a rezoning request from the developer is a plan to develop the same lands and adjacent federally owned lands as public park areas each of the components of the EIR of the proposed project should be compared with the environmental impact of an alternative development of the area into public park areas

Scenic Use of the Highway

The scenic view from the present highway in the area is a rare and outstanding feature of the area. Would the scenic views from the present highway be available in the proposed re-routed highway? Or would the proposed construction of homes in the area block scenic access to the lake? Assess the effect on sight lines to the lake and Forest from the proposed re-routed highway. Study the impact of the proposed development on scenic views from all public areas in the area that remain after completion of the development.

Paul H. Lastly

To: County of San Bernardino
Advanced Planning Division
385 n Arrowhead Ave
3rd Floor
San Bernardino, Ca 92415-0182
Att. Tracy Creason Ref: Environmental Impact Report /Moon Camp #16158

RECEIVED
MAR 19 2002

From: Steven F. Vansant
1068 Cherokee St.
Fawnskin, Ca 92333

Mailing Address: 19340 Box Canyon Rd, Corona Ca 92881

As a property owner in Fawnskin I am writing this letter to advise you of my concerns regarding the proposed development of lake front property on the north shore of Big Bear Lake.

Fawnskin is a unique community small, uncrowded and friendly. The proposed development on the lake front will take away from the views provided from the highway as visitors and property owner travel around the lake. Once development begins more and more tracts will be proposed and approved. Growth without sound planning is very dangerous. One does not have to travel far in Southern California to see what growth and poor planning have created. Here are a few examples: miles and miles of ocean shore line that is not even visible due to high rise buildings and gated communities, freeways and streets that are gridlocked , block after block of tract homes with no open space.

The proposed Moon Camp development is bad for Fawnskin, bad for the Big Bear Valley and bad for the visitors to the area.

I strongly urge you NOT to approve this proposal.

Steven F Vansant

Kathleen M. Brown
P.O. Box 1898
Big Bear City, CA 92314

34 USA

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave
3rd Flr
San Bernardino,
Ca 92415-0182

Attn: Tracy Creason Planner

Fawnskin, CA 92333-0423

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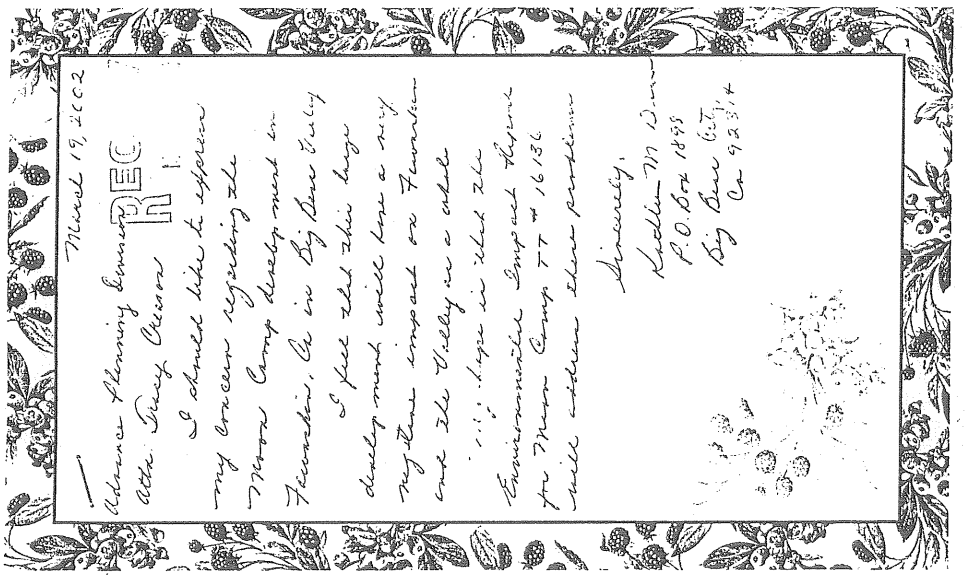
PM
19 MAR
2002

United We Stand

County of San Bernardino
Advanced Planning Div,
385 N. Arrowhead Ave, Third Floor
San Bernardino, CA 92415-0182

Attn: Tracy Creason

92415/0182



RECEIVED
MAR 20 2002

Re: Environmental Impact Report for Moon Camp TT#16136

To Whom it May Concern:

We've seen it before. A developer comes to a tucked away place and buys land, offering homes for people who want repose from the stress of freeway living. The developer claims that the local economy will flourish; residents claim that their quality of life will whither. County government supports the plan for no other reason than that it promises to increase the number of people paying taxes. Politicians can claim that they created jobs and paid for essential services, the supposed blessings of growth.

Though frustrated residents write and protest, the project goes through, but that's never the end of it. The people who come to live in the new condos never know what the old town looked like. Habitat is destroyed, wildlife becomes scarce, roads are enlarged, traffic is faster, and there is more noise to distract from what was once the reason for living in the town--its isolation from the world of the freeway.

This is a story of twentieth-century California, replicated over and over again from San Diego to Marin County. For anyone who grew up in the state, ``development'' means that people with no regard for a place somehow gain the power to utterly change it. It also means that local people, lured by the empty prospect of jobs and a stronger economy, will give up control over their open spaces and fresh air. It's been a long time coming, but the same mindless machine has finally come to Fawnskin.

The proposed developments at Moon Camp and Cluster Pines would violate every measure of quality for the people who now live in the vicinity.

The removal of a thousand trees from the area is a great insult. Not only will it lead to more erosion and runoff into the lake (trees and the forest floor hold a great deal of water from erosion), but it will destroy shore habitat. Developers always claim that displaced animals simply go elsewhere, but destroying habitat reduces the total number of animals that the environment can support. Herons, ospreys, hawks, bald eagles, and waterfowl have delicate nesting patterns and they do not respond well when habitat is chopped up into small pieces.

Developers never have any idea that people live within environmental limits. Human and animal populations in the valley depend on the runoff from a single watershed, and the water is not plentiful. The capacity should be evaluated by the dry years or the county risks a water famine in the valley. This alone should be enough to stop the project.

More people mean more cars and the pollution and disruption that cars always bring. Rerouting the road would aggressively and violently denude the hillside. No other outcome would so perfectly reveal that the county and the developer feel no responsibility whatsoever for the residents of Fawnskin. There is no ecological wreckingball to equal roads and cars. There is no way to maintain the environmental integrity of any place without limiting their reach.

There is never just one development. A county or city willing to allow developers to take control of such a fragile lakeshore must be mad with greed and must be willing to see the entire region paved over. They will claim that development does not change the air or the sunlight or the fact that trees cover the mountains. But further development will move Fawnskin one more step toward being just like every other place. Is that worth preserving? Is local diversity a scarce resource deserving of legal protection? And if the County and the developer demonstrate that they feel no responsibility for the desires of Fawnskin residents, what responsibility should residents have for them?

I first saw Big Bear Lake at the age of six, when my grandparents built a cabin at the top of Flicker Road. Visiting there taught me the diversity of life, showed me cycles and creatures. We had no idea that anyone else knew about the place or that so many people would build right next door.

If the process follows a typical pattern residents will have one hearing to make their arguments. Residents should ask the County Supervisors how needed services will be paid for, how water will be provided to an increased population when the next drought comes, and why they would want to destroy the scenic value of the lakeshore. Ask them why short-term gain should be favored over the long-term health of the lakeshore. Ask them why the idea of local control--a sacred Republican principle--is

so often ignored when people want to stop growth and development.

Yet these questions speak to the hardened economic interests of the County Supervisors. They won't satisfy the forlorn residents, many of whom might want to ask that the County stop the mindless machine before it rolls over a valley poised improbably between the coastal plain and the big empty of the Great Basin, where Jeffrey pine and prickly pear meet in an elegant transition between major ecosystems. The people of Fawnskin must feel just as delicate--like they also stand between opposing forces.

Steven Stoll
Yale University
Teacher of Environmental History

Steven Stoll

Betty Conroy
PO Box 165
Fawnskin, CA 92333-0165

Att. Tracy Creason County of San Bernardino
Planning Division
385 N. Arrowhead Ave 3rd floor
San Bernardino, Ca
92415-0182

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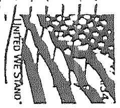
2002



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RECEIVED
MAR 20 2002

3/19/02

EIR for Moon Camp TT # 16136

I am writing this letter against the developing of this Property on Fawnskin. I have lived in Fawnskin in part at Cluster Pines for 13 years & across the street since then for 31 years

This project will have signafant problems in this small community. We enjoy the drive along the lake it is beautiful The highway belongs to the tax paying people & should not be changed to some developers in private enterprise rich - The traffic congestion & accidents on North Shore Drive should be analyzed in the Draft EIR - also water is a big issue the run off levels & sediment loads let alone the water shortage we now have. The sewer capacity the pipes are probably not suffient to handle all the proposed new homes.

We have to think of nature the trees are part of this beautiful valley they house our Eagles & other birds.

We do not need 132 condominiums in this area on 12.5 Acres come on, check the water table levels.

I think maybe the planning commision should forget the "big guys" money & take a good look at our beautiful little town & its scenery enjoyed by all who come

here. No visit. We don't need any more pollution in this unique area -

Very truly
Betty Conroy
P.O. Box 65 (39554 Backus Rd)
Fawnskin
909-866-3645

Environmental Impact Report (EIR) for Moon Camp TT#16136

County Of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave.,Third Floor
San Bernardino, CA 92415-0182
3/19/02

RECEIVED
MAR 21 2002

Attention: Tracy Creason, Senior Associate Planner

Dear Mr. Creason,

Synergism- Webster's Ninth New Collegiate Dictionary - 1990 says, "interaction of discrete agencies or agents such that the total effect is greater than the sum of their individual parts".
These proposed projects, Moon Camp and Cluster Pines(Marina Point Development), are ideal examples of the meaning of this word for us here in Fawnskin. The environmental results of these changes to our area are greater than the impact of the individual features of the projects.

For example, the proposed 132 condominiums and 75-slip marina at Cluster Pines will inflate the population, which will increase the water demands, already limited. As these units are sold,the fireplace smoke level increases; the traffic flow and noise from autos and boats (in season) increases. As the trees are removed to make room for the units, the scenic nature of the area decreases and the oxygen recovery that the trees would have brought when they were there will be gone.

The people that will inhabit these units are looking for mountain ambience away from urban sprawl. Unfortunately, they will be negating the very features of our area which they will move here to enjoy, including the Bald Eagle presence during the winter season. The same issues exist for the proposed Moon Camp development.

Synergism!

These projects are much too dense for this area. There is a reasonable compromise that can be worked out to decrease the density, eg., instead of 10 units per acre for the Cluster Pines development, reduce it to 2 units per acre and sell the acreage for more money to cover difference. The same philosophy could be used for the Moon Camp project.

I am sure the people that buy these units would not want to live in suburbia which they probably moved away from initially.

Most Sincerely,

Charles and Joan Cline
P.O. Box 275
Fawnskin, CA 92333

John J. Hawkins
POST OFFICE BOX 369 • 1037 GRAYBACK TRAIL
FAWNSKIN, CALIF. 92333
overlooking
Big Bear Lake

PHONE:
(909) 866-9403

0085
FAX (909) 866-9403
PUSH ASTERISK "*"
AFTER FIRST RING

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MAR 2 1 2002

3/19/02

TRACY CREASON
SENIOR ASSOCIATE PLANNER

THIS LETTER IS REGARDS TO THE "ENVIROMENTAL IMPACT REPORT (EIR) FOR MOONCAMP TT # 16136)

I HAVE ATTENDED TWO MEETINGS REGARDS TO THIS DEVELOPMENT. THE LAST WAS THE ONE THAT YOU WERE IN ATTENDENCE. I ALSO SENT A LETTER TO THE COUNTY PREVIOUSLY.

I NOW UNDERSTAND I MUST SEND ANOTHER LETTER, FOR THE SAME PURPOSE AS YOUR DEPARTMENTS DO NOT PASS ON INFORMATION TO THE NEXT.

AS I STOOD UP TO THE MICK. AND VOICED MY OBJECTIONS, ON MARCH 2, 2002, I WILL AGAIN FOR THE THIRD TIME TRY TO RELATE SOME OF THE NEGATIVE EFFECTS TO THIS DEVELOPENT PROJECT AGAIN. AS I REMEMBER MAR. 2 MEETING, THERE WERE (ON MY LAST COUNT) 52 REASONS (POSTED ON THE POSTER BOARD) BY MIKE WILLIAMS) WHY THIS WOULD BE AN ENVIROMENTAL PROBLEM TO BIG BEAR VALLEY AND MORE DIRECTLY TO THE FAWNSKIN AREA IN PARTICULAR. NOT TO MENTION MY OWN

John J. Hawkins
POST OFFICE BOX 369
FAWNSKIN, CALIF. 92333

San Bernardino County Land Use Services Department
Advance Planning Division
385 N. Arrowhead Ave. 3rd Floor
San Bernardino, CA 92415-0182

Attn. Tracy Creason
Senior Associate Planner

PERSONAL OBJECTIONS TO THIS PROJECT.

BIG BEAR VALLEY HAS BEEN GROWING WITH LEAPS & BOUNDS OVER THE PAST YEARS, A HOUSE HERE AND THERE, THIS IS NORMAL PROGRESS. THE COMMUNITY CAN ADJUST TO THIS TYPE OF POPULATION INCREASE WITH OUT MUCH NOTICE OR STRAIN ON ALL ASSOCIATED UTILITIES & NATURAL ENVIRONMENT. WHEN TWO MAJOR DEVELOPMENT PROJECTS PLAN TO BUILD DIRECTLY ACROSS THE ROAD FROM EACH OTHER THIS CREATES AN UNBEARABLE LOAD ON EVERYTHING AND EVERYONE THAT HAS BEEN IN THIS AREA FOR IN THE BEGINNING OF TIME (NATURE) AND FOR YEARS (PEOPLE). I HAVE BEEN IN THESE MOUNTAINS SINCE 1932. IN FAWNSKIN SINCE 1985. I CHOSE FAWNSKIN TO RETIRE IN AS IT WAS AWAY FROM THE CONGESTION OF BIG BEAR LAKE AND BIG BEAR CITY. SOON AFTER I SETTLED IN HERE THE COUNTY RE ZONED & DE ZONED THE AREA, INCLUDING MY PROPERTY, WITHOUT DUE NOTICE TO PROPERTY OWNERS. NEXT THEY CUT A NEW HIGHWAY THROUGH THE FOREST TO STREIGHTEN OUT THE ROAD. NOW THEY WANT TO CHANGE THE ROAD AGAIN.

PART OF THE CHARM AND THERAPY OF THE MOUNTAINS IS THE MEANDERING OF IT'S ROADS. THROUGH THE FOREST AND BY THE LAKESHORE.

EACH OF THESE CHANGES IN THE HIGHWAY ONLY

CREATES MORE OF A CITY STREETS EFFECT TO OUR CHOSEN HOME AREA.

THE DEVELOPERS COULD NOT CARE LESS. THEY ARE ONLY IN IT FOR THE DOLLAR. THEN THEY ARE OFF TO ANOTHER LOCATION TO SPOIL.

I PERSONALLY LOOKED AT 23 HOMESITES TO CONSIDER SETTELING DOWN IN, THROUGHOUT THE VALLEY. I FINALLY CHOSE FAWNSKIN AS MY HOME, AS I SAID, IN 1985. I HAVE SEEN THE CRACKED MUD BOTTOM OF THIS LAKE WHEN IT WAS DRY, ALSO NOT LONG AGO NEARLY THE SAME THING. POSSIBLY BY THE END OF THIS SUMMER WE WILL SEE THE SAME.

TO ADD 95 HOMES PLUS 132 CONDOS TO THIS AREA WILL OVERLOAD THE, NOW STRAINED, SEWER. IT WILL PUT FURTHER STRAIN ON THE CURRENT SHORTAGE OF WATER. ALSO THE STRAIN ON THE ELECTRIC SUPPLY THAT IS CURRENTLY INSUFFICIENT.

EVEN THE FORESTRY DEPT IN AN EFFORT TO SLOW DEVELOPMENT WILL NOT LET THE POWER COMPANY RUN MORE SERVICE LINES, NOR LET THE WORLD SOLAR SYSTEMS.

THE RUNOFF, FROM ALL OF THESE PROPOSED FINE NEW HOMES GARDENS, WILL PALLUTE THE LAKE FURTHER.

THE REMOVAL OF PLUS OR MINUS 1000 TREES FOR ROAD CHANGE 735 PLUS 300 + FOR HOME CONSTRUCTION.

THE TRAFFIC CURRENTLY IS CONGESTED WITHOUT THE 900 VEHICULAR, DAILY ACTIVITIES OF THIS ONE DEVELOPMENT, NOT TO MENTION ANOTHER QUANTITY FROM THE CLUSTER PINES CONDOS OF 132 UNITS.

THE EXHAUST POLLUTION WILL IN TIME KILL ALL PLANT LIFE. IT'S BAD EVEN NOW.

AT THE LAST MEETING I HEARD THERE IS ANOTHER 30+ ACRES BEHIND (TO THE NORTH) THIS 62± ACRES READY TO BE DEVELOPED. WHAT WILL THEY BE ABLE TO ADD? 45 HOMES? THAT WOULD ADD UP TO POSSIBLY 2 TO HOMES JAMMED INTO THIS ONE CONFINED AREA.

I WONDER IF THE FIRE DEPT. COULD EVEN HANDLE A MAJOR FIRE HERE.

IN A SHORT TIME THE NEW ZOO WILL ADD MORE TRAFFIC & POLLUTION TO THE NORTH SHORE AREA.

IF THIS IS ALLOWED TO PROGRESS THERE WILL BE NO STOPPING MASS DEVELOPMENT HERE.

ANOTHER ITEM TO CONSIDER IS THE OIL POLLUTION ON THE LAKE. A 100 BOAT SLIP MARINA WILL DEFINETLY ADD TO THE WATER POLLUTION, AS OUTBOARD MOTORS MIX OIL WITH GASOLINE TO LUBRICATE THE ENGIN PARTS. THIS OIL IS NOT BURNED AS IS THE GASOLINE. A LARGE PERCENTAGE OF THE OIL IS PUMPED OUT WITH THE EXHAUST. ONE ONLY HAS TO LOOK AROUND ANY OUTBOARD MOTOR BOAT TO SEE THE OIL FILM ON THE WATER.

BESIDES THE AUTO'S POLLUTING WITH TRAFFIC AND EXHAUST, THE ADDED STRUCTURES AND PEOPLE WILL REQUIRE MORE AND MORE HEAVEY TRUCKING TO SUPPLY ALL OF THE DEMANDS OF THE PROPOSED INCREASE OF THE DEVELOPMENTS.

THE MEDICAL FACILITIES IN BIG BEAR CAN'T TAKE CARE OF THE CURRENT POPULATION. THE POPULACE HAS TO GO OFF THE HILL TO GET ADEQUATE CARE.

LITTLE BY LITTLE I NOTICE THE WILD LIFE VANISHING. I HAVE SEEN BROWN BEAR CUBS (2) TO GET HERE. RACCOONS ON MY DECK, COYOTE'S IN MY YARD, DEAR ON THE NEARBY ROADS. EAGLES, HAWKS, CROWS. I FEED 22 SPECIES OF SMALL WILD LIFE.

THE LARGER WILD LIFE HAS ALMOST DISAPEARED. IT WILL ALL BE GONE IF THIS MASS DEVELOPMENT ISN'T SLOWED UP OR STOPPED.

I COULD GO ON AND ON BUT I THINK I HAVE SAID ENOUGH. IT IS UP TO YOUR DEPARTMENTS I GUESS AS TO WHEATHER THOUSANDS OF PEOPLE CAN ENJOY THESE MOUNTAINS IN THE FUTURE OR IF THE DEVELOPERS WILL TURN THEM INTO ANOTHER L.A. OR N.Y. OR WORSE YET PARIS.

THANK YOU,
RESPECTFULLY.

J. J. Hawkins
P.O. BOX 369
FAWNSKIN, CA. 92333

Ken and Barbara Winter
2220 Palm Way, Upland, CA 91784

March 19, 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave., Third Floor
San Bernardino, CA 92415-0182

Attention: Tracy Creason

Regarding: Environmental Impact Report for Moon Camp TT 16136

This letter is to express my concerns on the proposed development of the subject project and its impact on the community of Fawnskin and adjacent properties. I have been a land owner of Fawnskin since 1967. Over these 35 years, I have enjoyed this community for it quiet serene beauty and an environment where the residents enjoy a peaceful setting within the pine and oak trees and its uncongested ambiance unlike other communities of the Big Bear Valley. The intensity of the proposed project along with others that are proposed within the community will change our environment drastically.

Such changes have not been adequately addressed at a community level. The impacts of this project along with the Cluster Pines (Marina Point?) development (although time limits of this have expired) have never been address for the total community. The County's general plan is at such a gross scale that it does not adequately address the goals and desired direction of the Fawnskin community. No project at the magnitude of these projects should be approved without having a more definitive plan for Fawnskin. Such plan should be a specific plan, adopted by ordinance by the County, after extensive public input from the residents and property owners of Fawnskin.

Without such a plan it is very difficult to address the project impacts at the level that environmental impacts should be evaluated. However, the following is a listing of some of the environmental impacts that must be address, the cumulative impacts on the community as well as the entire valley, meaningful, realistic and measurable mitigation measures of such impacts and project alternatives presented:

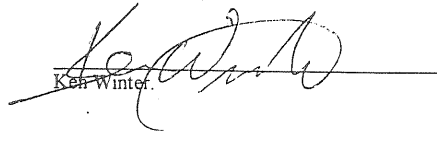
1. **Land Form Alteration.** Extensive grading will be necessary to accommodate roads and building pads of the project and realignment of the state highway must be evaluated. This should include scaring of the hillside and such impacts on the viewshed from the highway and from the lake..
2. **Impacts on the Quality of Life for Fawnskin Property Owners.** I, as well as perhaps most property owners of Fawnskin bought or built homes in this community because of its serene ambiance and uncongested environment. This project as well as others proposed in the community will degrade this quality of life in Fawnskin and such impacts must be addressed. Project alternatives must be thoroughly address for a project of lesser density.
3. **Impacts on the Wildlife and Vegetation.** The extensive removal of our pine trees anticipated by this project is unconscionable. Pine and oak trees are one of our most cherished natural element and should be protected at all costs. Tree removal will also impact the Eagle habitat and other migratory fowl. This project will have significant impacts on or destroy endangered or threatened habitat areas with in the Big Bear area. The EIR must contain a through Biological assessment that takes into account seasonal changes in animal and fowl migration and living patterns. Any project must contain wildlife migration corridors extending to the lake edge.
4. **Impacts to the Lake.** Construction grading, additional runoff from urban development within the watershed along with its contaminations will continue to degrade the water quality of the lake. This will also have a long term impact to the economic vitality of the entire valley. The recreational draw to the valley will be impacted if our lake suffers additional degradation.
5. **Loss of Scenic Quality.** Rerouting of the highway and placement of homes on the lake side will significantly degrade the scenic quality of the north shore driving experience for the people of California. The EIR must address the impact of the loss of scenic driving experience for the public and its replacement for the privileged few who can afford waterfront homes. Evaluate the public cost of this impact.
6. **Increased Traffic Impacts**. Cumulative impacts of this project as well as other projects within the Big Bear Valley on the state highways leading into the valley and the major arterials within the valley must be addressed. These roads are already heavily impacted.
7. **Impacts on Public Services**. The incremental increase to an already impacted water, sewer, electrical and natural gas utility system must be addressed.
8. **Impacts on Protective Services.** Project impacts on the police, fire, emergency services response times and medical services must be addressed.

The above are just a few of the many environmental impact that will caused by this project and will need to be evaluated during the preparation of the EIR. In addition, if the County overlooks the expiration date and determines that the project proposed at Cluster Pines (Marina Point?) may proceed, then that project must be evaluated along with the subject project.

Any EIR must have an evaluation of alternatives. The No Project alternative must be thoroughly addressed. In addition, the County staff should consult with the Friends of Fawnskin and other such Fawnskin citizen groups to seek input from them as to project alternatives that may be in keeping with the community desires.

I request that my name be added to the mailing list for this project and I get notices of all meetings, hearings and am on the distribution list to receive a copy of the EIR.

Looking forward to your response to these and all comments about this proposed project.



Ken Winter

RECEIVED
MAR 2 0 2002

Ken and Barbara Winter
2220 Palm Way, Upland, CA 91784

March 19, 2002

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave., Third Floor
San Bernardino, CA 92415-0182

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Regarding: Environmental Impact Report for Moon Camp TT 16136

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I request that my name be added to the mailing list for this project and I get notices of all meetings, hearings and am on the distribution list to receive a copy of the EIR.

Looking forward to your response to these and all comments about this proposed project.

_____
Ken Winter.

VIA FACIMILE

March 20, 2002

County of San Bernardino, Advance Planning Division
385 N. Arrowhead Ave., Third Floor
San Bernardino, CA 92415-0182
Attn: Tracy Creason, Senior Associate Planner

RE: Environmental Impact Report (EIR) for Moon Camp TT #16136

Dear Ms. Creason:

As a new full-time resident of Big Bear Lake, I am writing to express my concerns regarding the proposed development at Moon Camp. I understand that an Environmental Impact Report is currently being conducted. My purpose in writing this letter is to request that certain issues be carefully studied and addressed in this most important process. My major concerns are as follows:

- Air quality: What will be the impact on air quality of the increase in emissions from traffic, fireplaces, boat engines, ATV's, leaf blowers, etc.?
- Water quality: What will be the impact from the additional runoff from this proposed development on the quality of the lake water?
- Water quantity: The lake level is extremely low due to four years of drought. I understand that this is a common issue. How will these additional homes impact these regular drought conditions?
- Energy: I understand that the local electricity providers claim that no more power lines can be added and that the valley is already short on electrical power. What impact will this development (along with others in the valley) have on power supplies?
- Tree Removal: I understand that this proposed development includes the removal of a large number of old growth trees. This is very disturbing to me as what makes this area so special is in large part due to these magnificent old trees. If they are removed they will not grow back in our lifetime and replacement with new trees is not at all the same as preserving an old growth tree.
- Eagle Habitat: I understand the entire Moon Camp area is an eagle habitat area. The ability to view our national symbol in its natural habitat is a rare and special opportunity for tourists and locals alike. How is this issue being addressed?
- Other wildlife and plants: How is the impact on other wildlife and plants being studied and addressed? As many of the wildlife and plants are seasonal, it seems that anything less than a full year of study would be inadequate. How is this being addressed?
- Light Pollution: The clear and brilliant night sky in Big Bear is a priceless treasure to residents and visitors. There are very few places so close to Los Angeles and San Diego where seeing such a clear and brilliant night sky is possible. This is a major reason tourists come to the valley. I am very worried that these additional homes (and other development in the valley) will diminish the intensity of the night sky. Has this issue been considered and fully studied?

- Medical Services: It seems that the fire, emergency and hospital services in the valley (and Fawnskin in particular) are very limited. What impact will this development have on our ability to receive prompt emergency attention?
- Traffic congestion: I am quite often surprised by the congestion in Big Bear on weekends and holidays, frequently worse than I experienced living in Los Angeles. What impact will all of these new homes have on traffic congestion? In particular at the Stanfield Cutoff which crosses the lake?
- Public Access to the Lake: Very few residents or tourists can afford to live on the lake itself. Public access to see and experience the lake are extremely important to property values, quality of life and tourism. I understand the proposed Moon Camp project would prohibit public access to the lake and that the designated scenic highway would be obstructed. This would be very unfortunate for many residents and negatively impact tourism and property values overall.
- Property Values: Having just invested substantially in my Big Bear Lake residence, I'm concerned about the negative impact the development would likely have on property values in the valley. Having just purchased a property, I have observed that there is an abundance of property for sale in the valley. This includes Lakefront property. Why is new development even necessary as long as this is the case?
- Lake Usage: I'm very much looking forward to kayaking on the lake this summer. What impact will a 100-slip private marina have on lake congestion and pollution?
- Economic Impact: It seems the development has the potential to reduce revenues at the existing marina and lodge businesses. How is this being studied?
- Developer's Track Record: I understand that this particular developer has a poor track record when it comes to mitigation terms and protecting areas developed. How is this issue being addressed?
- Quality of Life: The reason many of us live in or visit Big Bear is that it is less developed and more natural than other places. I'm concerned that this development and others like it will spoil the very thing that makes the area attractive to residents and visitors. I also understand the developer is seeking to change the zoning from one home for each 40 acres to 92 homes on 64 acres. This is a very significant change that will completely change the character of the area. It seems to me this change would only benefit a few to the detriment of many.

I understand that it may be possible to expand the National Forest lands as an alternative to the proposed rezoning. This seems to me to be worthy of serious exploration as it would preserve and protect this area for the benefit of all people who come to the valley to enjoy the unique, unspoiled natural environment that Big Bear offers.

I appreciate this opportunity to express my concerns and views regarding the proposed Moon Camp development. I am grateful to you and your colleagues for the work you do on behalf of all of us.

Best Regards,

Lisa Patterson
431 Tennessee Lane, PO Box 412
Big Bear Lake, CA 92315
(909) 866-0787

March 20, 2002

County of San Bernardino, Advance Planning Division
ATTN: Tracy Creason, Senior Associate Planner

Subject: EIR for Moon Camp TT#16136

I am concerned that these issues be analyzed and disclosed in the Environmental Impact Report:

What effect will increased runoff pollution from the development's landscaping and paved areas have on water quality in already over-burdened Big Bear Lake?

Is there truly a sufficient supply of water for these houses from a finite supply in this arid valley? Can the existing sewer system handle the added burden?

How can the removal of vast numbers of old growth trees be mitigated, or even justified? Planting a sapling to replace a tree that took many human lifetimes to grow is not a solution.

What effect on wildlife will the removal of these trees have? Also, what effect on water habitat will the large increase in boating have?

What effect will increased watercraft use from a 100-slip marina have on Lake Pollution?

What effect will there be on public recreation when this gated community bars public access?

Finally, why doesn't San Bernardino County see the benefit to all the citizens in the county if they would work with the Forest Service to expand public lands, giving access to recreation in Big Bear for generations to come?

Thank you for your consideration. A Hard Copy tofollow.
Sincerely

John L Barber, III
PO Box 1494
Sugarloaf, CA 92386

To: San Bernardino County, Advanced Planning Division
Att: Tracy Creason, Senior Associate Planner
Date: 3/20/02
From: Jim and Janet Dooley
39128 North Shore Drive
P. O. Box 98
Fawnskin, CA 92333
(909) 866-5626
Re: Environmental Impact Report (EIR) for Moon Camp TT#16136

RECEIVED
MAR 2 1 2002

We live in Fawnskin, about one mile from the proposed project, rezoning a 40-acre parcel area to small lots in order to build 92 homes. We have some questions we hope you will give serious thought to:

1. Where will the water come from for these additional homes? The water system in Fawnskin is at peak capacity now. Can the Fire Department be assured of a sufficient supply to fight fires? Can the present sewer system handle the extra load? How will the expected runoff levels and sediment loads affect the lake? If a well is dug for water for this project, how will it affect the water level of the lake?
2. How will this development affect the bald eagle habitat now existing on this plot of land? How will the removal of old growth trees affect the eagles? What other endangered species of plants and animals will be affected?
3. How is the traffic to be handled? Ninety-two new homes will create a lot of traffic, up to 900 more trips a day according to the project developer's traffic study. We live on the North Shore of Big Bear Lake because we don't mind the 15-minute ride into town along a lakeshore drive. It's beautiful. But moving the highway inland would remove the beauty part of the drive. How much longer will the drive take me due to increased traffic?
4. How is the air pollution to be handled due to log burning fireplaces and increased car traffic? In the winter, our valley gets quite an inversion layer that keeps all the smoke from everyone's log fire down on the ground.
5. Why do so many trees need to be cut down? The initial report stated that seven hundred trees (roughly 25%) would need to be cut down just for moving the highway inland. What would this due to indigenous animal habitat? Can we apply the same standards as the new Tree Ordinance for the city of Big Bear Lake?
6. What about the light pollution? How will this affect the Solar Observatory on North Shore Lane, which now includes some night observing?
7. Will a proposed 100-slip marina be open to the public? How will it ensure public access to the lake?
8. How will the developer's bad track record regarding adhering to mitigation terms and protecting the developed areas, certainly shown in his handling of the initial notification of residents of Fawnskin, be mitigated? What penalties can be administered to keep him in line?

We do not subscribe to the I-got-mine-now-you-stay-out theory. Limited growth consistent with the surrounding area is desirable. But we do have objections to the proposed project:

1. Ninety-two homes in this size area are too many – 20-30 would be more in keeping with the surrounding town, and far fewer boat slips from 100 down to 40.
2. The highway, where it is now located, is a scenic drive and should not be moved.
3. Any Environmental Impact Report should be on the entire project and not piecemeal lot by lot and include seasonal changes in animal migration and living patterns. A one-year study seems minimum.
4. Eagle habitat must be preserved at all costs, that means keeping all perch trees.
5. Sufficient water and other utilities must be provided.
6. Traffic should not be a burden to present residents.
7. No more than 10-15% of trees should be removed.
8. The size of the homes, maximum houses on minimum lots with only five foot side yards, is not consistent with the mountain character of Fawnskin. This is a rural, not urban, area and "city" development standards should not apply.
9. Any development project should include some redevelopment of the commercial downtown.

We request the following:

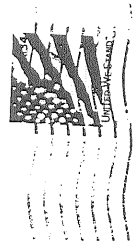
- that we receive special notice of anything that affects this project;
- that all mail be delivered to our post office box;
- that all hearings take place in Big Bear Valley so the public can attend.

Thank you for hearing our concerns and answering our questions.

Sincerely,

James P. Dooley

Janet L. Dooley



County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave.
San Bernardino, Ca 92415-0182
Att: Tracy Creason

92415+0182

M.L. Smith
P.O. 174
Fawnskin, Ca.
92333

March, 20, 2002

RECEIVED
MAR 21 2002

Howard I. Smith
P.O. Box 174
Fawnskin, Ca. 92333

Dear Ms. Creasey -

Along with those thirty issues listed in the enclosed memo, may I add this deeply felt concern for the future of this beautiful mountain Valley.

Having lived Los Angeles' wild growth, I see the terrible possibilities of that uncontrolled growth happening again, and happening here in Fawnskin bringing with it the curse of so many untamed lessons.

Hopefully, under your astute guidance, those listed issues and lessons will be paramount, and your decision one of conscious, excluding all else.

Sincerely,
Howard Smith

Arthur & Ileba Voltz
P.O. Box 283
Fawnskin, CA 92333

County of San Bernardino
Environmental Planning Division
385 No. Arrowhead Ave., Third Floor
San Bernardino, Calif. 92415-0182

Attn: Tracy Creasey, Senior Planner

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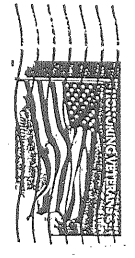


RECEIVED
MAR 21 2002

E. I. R. For Moon Camp T. T. # 16136

We live about ¼ of a mile east of the Moon Camp Project on Highway 38 and have a number of concerns about the development of Moon Camp. I'll see is first a couple that I will go into for now.

Living right on Highway 38 just east of the Moon Camp Project, I have a clear view of the traffic going west on Highway 38. Many times vehicles are going 60-70 miles per hour. My concern is how is this traffic going to make the 90° right hand turn on to Moon Lane, which then connects to the new alignment of Highway 38. This seems very dangerous to me.

Another concern of ours, is the bald eagles. We receive our mail at the Post Office in Fawnskin, and in so doing, we drive through the Moon Camp Development Area on Highway 38 four or five times a week. On numerous occasions in the winter we have seen the bald eagles setting in pine trees along side of the road. This is really a beautiful sight to see. What happens to the eagle habitat when you cut down 730 pine trees in this area? No more eagles to see!!

Thank you for your time.

Sincerely,

Arthur and Rita L. Voltz
40127 No. Shore Ln.
P.O. Box 235
Fawnskin, Calif. 92333

Mr. & Mrs. Richard D. Fromm
P.O. Box 411
Fawnskin, CA 92333

Wednesday, March 20, 2002

RECEIVED
MAR 2 1 2002

County of San Bernardino,
Advanced Planning Division
385 N. Arrowhead Ave., Third Floor
San Bernardino, CA
92415-0182

ATTENTION: **Tracy Creason**, Senior Associate Planner

RE: Environmental Impact Report (EIR) for Moon Camp TT #16136

Dear Ms. Creason

Summary:

As fulltime residents of Fawnskin we are completely opposed to the granting of the proposed land use amendment known as "FILE/INDX: GPA/TT/M331-8N/APN:0304-091-12". As such we are submitting our concerns to be addressed in the pending EIR for Moon Camp TT #16136. Such a drastic modification to the current land use designation in the community of Fawnskin will endanger human and animal life, strain utility usage and school resources, increase pollution to the environment, increase "people" congestion, decrease current owners' property values, generally disrupt the existing community, and add a cumulative impact to the other projects initiated in our community. The approval of said amendment and then the construction of 92 (ninety-two) single-family units will destroy the rustic ambiance which defines Fawnskin as a community for what it is and for what the current residents and business owners choose for Fawnskin to be.

Specifics:

1. Said proposal essentially creates a residential community in the middle of a forest, but adjacent to the community of Fawnskin, while surrounding the only traffic path, North Shore Drive, that circumnavigates Big Bear Lake. With the movement of the Moonridge Zoo to the Discovery Center, which is not too distant from the proposal area, has the additive/cumulative effect of both 92 single family residences and the zoo been accessed along with the Cluster Pines development and other proposed developments? Probabilistically, the increase in residents will increase the potential for traffic mishaps, congestion and noise/air pollution.

2. Simple logic and reason demonstrates that said construction would destroy the habitat of the existing animal life, especially the eagle habitat. One need only look at the impact of the fire of two summers ago to judge the reduction in animal life. Creation of this residential community will cause the same eradication of wildlife habitat albeit on a smaller scale. Equally, the impact to plant habitat needs to be addressed, e.g., what is the total number of trees that will be removed in the Moon Camp area and is there other plant life that will become endangered? Due to the seasonal nature of both the plant and animal life, said impact of this project must be assessed across all four season to be valid.

TRACY CREASON, SENIOR ASSOCIATE PLANNER
c/o County of San Bernardino,
Advanced Planning Division
385 N. Arrowhead Ave., Third Floor
San Bernardino, CA
92415-0182

SAN BERNARDINO CA 92415
20 MAR 2002
PM

3. Although said proposal presumably will require the addition of utility capacity to the 92 home sites, what of the demand at the source of said utilities? The Department of Water & Power currently advises existing residents to conserve water due to a shortage, which is almost an annual plea from the DWP. Restrictions are currently in place to force water conservation. Additionally, increased residential homes will add to the demand of electricity and natural gas, both of which recently have experienced radical increases in user costs due in part to existing demand. Is there adequate sewer capacity to accommodate the new developments?

4. The impact on fire, paramedic/ambulance, and police services must be addressed for the overall well being of the Fawnskin residents.

5. Has the impact on the local school district, which would direct appropriate-aged students to a single elementary school, been assessed due to the addition of 92 residential dwellings? Does the school have the capacity to absorb said increase?

6. North Shore Drive is be to modified in the area impacted by this proposal. Currently that road is narrow and winding in the proposal area. Those parts of the road just adjacent to the proposal area are equally narrow and winding. Added traffic caused by the addition of 92 single family residences will impact the adjacent roadway using the same rationale that caused North Shore Drive to be planned to be modified in the proposed area. Certainly the road through the community of Fawnskin will not be widened due to the close proximity of business establishments to said roadway, i.e., the traffic problems have not been addressed outside the boundaries of the proposal area.

7. The addition of 92 single-family residences (unless each is forever unoccupied) will increase noise, air, and ground pollution disrupting the quality of the current environment. What of the scenic beauty of the North Shore of Big Bear Lake? 92 single-family residences cannot be invisible. Creation of these structures will forever tamper with the pristine nature of the area. Tangentially, what is the impact on lake access for the North Shore due to this development?

8. The Moon Camp property is adjacent to the National Forest. What is the perspective of the U.S. Forest Service on this project?

9. The developers of the Moon Camp land are a long, established business in the Bear Valley. Their track record with regard to environmental terms and conditions of approval in previous endeavors should be evaluated and assessed relative to this proposal.

10. Assuming the "law of supply and demand" is operative, the increase of 92 single family residences (supply) will significantly increase the pool of available homes for sale in the Fawnskin area; deductively, then, the prices of existing homes for sale will decrease due to added supply. True or false?

11. Currently, Fawnskin is a relatively rustic community BY CHOICE. The past and current residents have chosen to keep this type of environment. People who prefer a more "residential community" have other, current options in the Big Bear Valley, e.g., Moondridge, Fox Farm, and many areas in the City of Big Bear Lake. In the Summer of 2001 there was a retirement party for the then-postmaster of Fawnskin, Linda Neuman, at Captain John's

Marina in Fawnskin. By actual count 250 residents attended. Casual, neighborly conversation most certainly surfaced the pride and civic spirit of Fawnskin. Much of that attitude centers on the "rustic" aspect of the community. To plop a residential community immediately adjacent to Fawnskin, as this proposal does, creates an incongruity and an unsettling effect to Fawnskin's ambiance. Hence, any environmental assessment must be from the perspective of maintaining the rustic nature of Fawnskin and not from an urban impact assessment.

Richard D. Fromm

Charlene O. Fromm

Richard D. Fromm
Charlene O. Fromm
P.O. Box 411
39312 Cedar Dell Road
Fawnskin, CA
92333-0411
909-866-8235
ricktrap@earthlink.net

Frank & Ina Aranguren
P.O. Box 522
Big Bear Lake, CA 92315

Co. of San Bernardino, Advanced Planning Div.
385 N. Arrowhead 3rd Floor
San Bernardino 92415-0182

Attn. Tracy Creason,
Senior Associate Planner

92415-0182

RECEIVED
MAR 21 2002

P. O. Box 522
Big Bear Lake, CA. 92315
March 20, 2002

Co. of San Bernardino
385 N. Arrowhead
San Bernardino, CA 92415-0182
Attn: Tracy Creason,
Senior Associate Planner
Ref: EIR Moon Camp TT # 16136

We are vigorously opposed to the above development. We feel the plan reveals an excessive development for such a delicate, natural environment.

Please consider this opposition as you evaluate the project.

Thank you,

Ina Aranguren
Frank Aranguren

Harold & Peg Allen
P.O. Box 23
Fawnskin, CA 92333

Environmental Impact Report (EIR) for Moon Camp TT#16136.
Send letters to: County of San Bernardino, Advance Planning Division,
385 N. Arrowhead Ave., Third Floor, San Bernardino, CA 92415-0182,
Attention: Tracy Creason, Senior Associate Planner.

92415+0182

FILE # GPA/TT/M331-8N/01/XPN: 0304-091-12

1/4

ADDITIONAL PAGE
RESPONSES TO PROJECT NOTICE

Re: RCK, Applicant, Tentative Tract 16136

1. Object to the number of trees that would have to be removed, not only for roads and other easements, but also for building sites.

2. Object to any downzoning because of eagle habitat. On one perch tree in the proposed development there have been as many as three eagles seen perched on one tree.

3. Object on the basis that the developer has previously expressed an intention to re-align State route 38 northward so as to provide adequate lakefront lots.

4. Object on the basis that lakefront lots would destroy the lake-view from the existing highway.

5. Object on the basis that with people now building large houses on minimum-sized lots in Big Bear, any downzoning would be inconsistent with the mountain character of Fawnskin.

6. Object that any proposed moving of the highway of State Route 38 would increase traffic noise levels to the already existing residences above the proposed development.

7. Object on the basis that currently there is insufficient water in Fawnskin to support 92 additional residences.
8. Object on the basis that State Route 38 in that area could not adequately support the increased traffic flow in that area.

9. Object on the basis that a 92-hom subdivision will cause serious light pollution in the Fawnskin area

10. Object on the basis that there has been no EIR with respect to the ~~proposed zone change~~ ENTIRE PROJECT

11 OBJECT TO THE SHORT NOTICE GIVEN FOR THIS PROJECT AND THE TIME ALLOWED TO RESPOND FROM JULY 20 2001 TO AUG 3 2001. I LEARNED OF THIS PROJECT ONLY THRU A FRIEND.

12 OBJECT AS IT WILL EXTREMELY CHANGE THE MOUNTAIN HOME CHARACTERISTICS OF FAWNSKIN. I MOVED HERE BECAUSE OF THE QUAINT MOUNTAIN COMMUNITY FAWNSKIN IS AND DO NOT WANT THE HOUSING DENSITY CHANGED TO THAT OF THE SUBURBS-LIKE HANNEIM (EXAMPLE). HOMES HERE HAVE BEEN BUILT (1) AT A TIME BY INDIVIDUALS AND SMALL LOCAL CONTRACTORS. (92) HOMES BEING THRUST UPON US IN A SHORT SPAN OF TIME, ALL IN ONE LOCATION AS THIS PROJECT SUGGESTS OF ITSELF, IS NOT THE CHARACTER OF FAWNSKIN - BUT, MORE THE CHARACTER OF BIG BEAR LAKE CITY AND BIG BEAR CITY - I CHOSE NOT TO MOVE THERE AS I DO NOT LIKE CLOSE QUARTERS LIVING.

OBJECT 13 I DO NOT WANT HIGHWAY 38 RE ALIGNED TO A "STRAIT" ROAD. ITS PRESENT CHARACTER IS CONGRUOUS TO THE REST OF THE ROAD AS IT PASSES THRU FAWNSKIN NEAR THE HARBOR OF DANA POINT (CAPTAIN JOHNS MARINA).

14 OBJECT TO INCREASED LIGHT POLLUTION AT NIGHT TIME. I SEE A BLUE-BLACK SKY WITH ASTOUNDING SILVER DIAMONDS (STARS) AFTER SUNSET AND WITHOUT THE MOON. I DO NOT WANT TO BE DEPRIVED OF THIS LOCAL

CONT.

PRIVILEGE. DID YOU KNOW THAT SHOOTING STARS ABOUND AND YOU CAN SEE THE MILKY WAY? NOT SO IN HANNEIM CA. THANKS TO LIGHT POLLUTION FROM TRACT TYPE HOUSING. (I MOVED TO FAWNSKIN FROM HANNEIM)

OBJECT 15 I CAN NOT STOP THE GROWTH AND DEVELOPMENT OF HUMANITY BUT I DO ASK THE PROJECT BE GREATLY DOWNSIZED IN ITS PERSPECTIVE RELATIVE TO THE AREA TO WHICH IT IS TO BE DEVELOPED. I SUGGEST THAT ONLY (30) HOMES BE PLACED UPON THIS LARGE (92) FUTURE HOMESITE NOW IN DEVELOPMENT. CONSTRUCTION HERE SHOULD BE DONE ON THESE HOMESITES IN THE ESTABLISHED TRADITION OF OWNER/BUILDERS OR LOCAL SMALL CONTRACTORS THAT DO STRUCTURES ONE LOT AT A TIME - NOT IN MASS. THIS WOULD BE IN KEEPING WITH THE BUILDING THAT HAS OCCURED IN FAWNSKIN (POPULATION # 380) DURING THE MOST RECENT 100 YEARS.

16 OBJECT SUMMARY TO MASSIVE A PROJECT IN TOO SMALL OF AN AREA TO QUICKLY

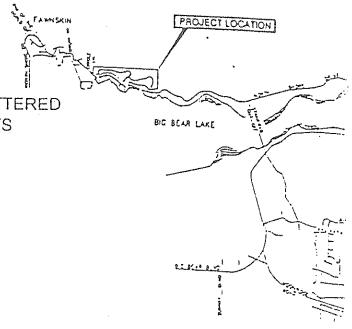
Harold Allen
HAROLD ALLEN
PO BOX 23
FAWNSKIN CA 92333
PHONE OR FAX 909 866 1937

SAN BERNARDINO COUNTY LAND USE SERVICES DEPARTMENT/PLANNING DIVISION
PROJECT NOTICE

4/4

Acceptance Date: July 20, 2001

VICINITY MAP



APPLICANT: RCK PROPERTIES, INC.
PROPOSAL: A) GENERAL PLAN/LAND USE DISTRICT AMENDMENT FROM RURAL LIVING-40 AC MIN. LOT SIZE (RL-40) TO SINGLE RESIDENTIAL 7200 SF MIN. LOT SIZE (RS)
B) TENTATIVE TRACT 16136 FOR 92 NUMBERED LOTS & 3 LETTERED LOTS SUBDIVISION WITH MAJOR VARIANCE TO ALLOW 2 LOTS TO EXCEED LENGTH TO WIDTH RATIO ON 62.43 ACRES
COMMUNITY: BEAR VALLEY (FAWNSKIN)/ S-3
LOCATION: BOTH SIDES OF NORTH SHORE RD., APPROX. 200' EAST OF ORIOLE LANE
DATES; 745MTN01011076GPA/TT01/I1076CF1
FILE/INDX: GPA/TT/M331-8N/01/APN:0304-091-12*
REP('S): PATRICK J. MEYER, URBAN ENVIRONS

ATTENTION PROPERTY OWNERS AND REVIEWING AGENCIES:
The development proposal listed above has been filed with the County Land Use Services Department/Planning Division. You are invited to comment because your property is located near the proposed project.

Your comments must be received by this department no laterthan **August 3, 2001**. Comments received after this date might not be considered in the decision. Please refer to this project by the applicant's name and FILE/INDX number indicated above. If you have no comment, a reply is not necessary. If you have any questions regarding this proposal, please contact **Mike Williams** at (909) 387-4168, or mail your comments to the address below, or via FAX to (909) 387-3249.

San Bernardino County Land Use Services Department/Planning Division
385 N. Arrowhead Ave., First Floor, San Bernardino, CA 92415-0182 Phone (909) 387-4168

If you want to be notified of the project decision, print your name clearly and legibly on this form and mail it to the address above along with a self-addressed, stamped envelope. All decisions are subject to an appeal period often (10) calendar days after an action is taken.

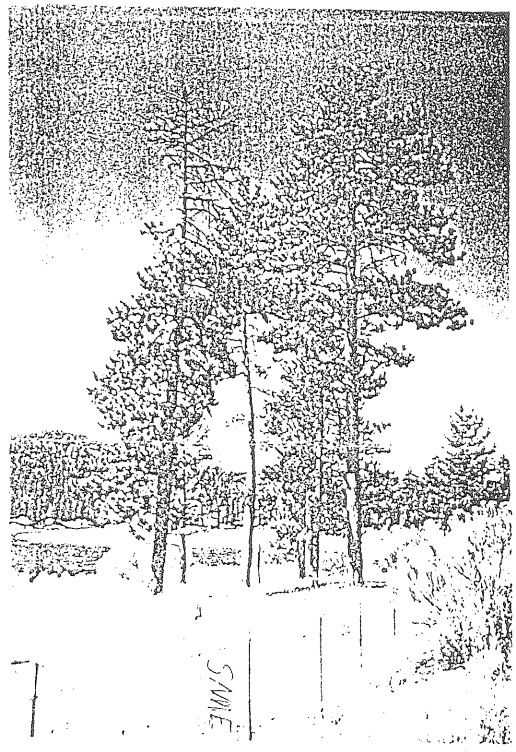
COMMENTS (If you need additional space, please attach additional pages):

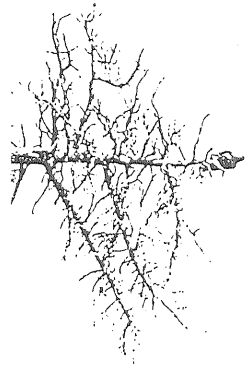
SEE ATTACHED; 4 PAGES TOTAL

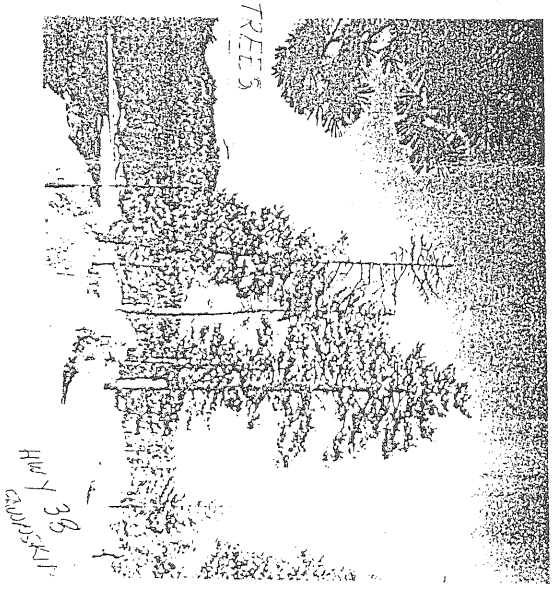
Harold Allen — SIGNATURE
8-02-01 — DATE
FAWNSKIN RESIDENT — AGENCY

IF YOU CHALLENGE ANY DECISION REGARDING THE ABOVE PROPOSAL IN COURT, YOU MAY BE LIMITED TO RAISING ONLY THOSE ISSUES YOU OR SOMEONE ELSE RAISED IN WRITTEN CORRESPONDENCE DELIVERED TOTHE LAND USE SERVICES/DEPARTMENT/ PLANNING DIVISION AT, OR PRIOR TO, THE TIME IT MAKES ITS DECISION ON THE PROPOSAL OR, IF A PUBLIC HEARING IS HELD ON THE PROPOSAL, YOU OR SOMEONE ELSE MUST HAVE RAISED THOSE ISSUES AT THE PUBLIC HEARING OR IN WRITTEN CORRESPONDENCE DELIVERED TO THE HEARING BODY AT, OR PRIOR TO, THE HEARING.

DUE TO TIME CONSTRAINTS AND THE NUMBER OF PERSONS WISHING TO GIVE ORAL TESTIMONY, TIME RESTRICTIONS MAY BE PLACED ON ORAL TESTIMONY AT ANY PUBLIC HEARING ABOUT THIS PROPOSAL. YOU MAY WISH TO MAKE YOUR COMMENTS IN WRITING TO ASSURE THAT YOU ARE ABLE TO EXPRESS YOURSELF ADEQUATELY.







EAGLE 2-25-02
4 PICTURES OF SAME PLACE

Friends of Fawnskin

--Making a Difference in Big Bear Valley--

RECEIVED
MAR 2 1 2002

Who We Are: *Friends of Fawnskin (FoF)* is a coalition of local residents and visitors of Fawnskin, California, along with individuals and groups throughout Big Bear Valley, the San Bernardino Mountains and Southern California who have come together to accomplish a mutual goal for the benefit of all concerned.

Our Mission: To maintain and protect the nature-oriented ambiance of the historic small town of Fawnskin on the north shore of Big Bear Lake. Residents and visitors come to Fawnskin because of the unique character of the town. Our goal is to preserve the basic essence of this character for the future enjoyment of all valley residents and the many visitors to this unique area.

Membership and Organization: Any individual or group with similar interests is welcome and membership is free. All members receive updates via email or mail on issues impacting Fawnskin. An Advisory Committee of local property owners evaluates issues of concern and develops by consensus recommendations for actions most appropriate and effective in maintaining the character of Fawnskin and the surrounding areas.

Major Current Issues: There are two proposed developments of immediate concern:

1. **MOON CAMP:** RCK Properties proposes changing the zoning from one home on 40 acres to 92 homes on 64 acres of now open land (east of Canyon on North Shore), with a gated community on the lakefront and a 100-slip private marina.
2. **CLUSTER PINES: (Marina Point Development):** Proposes 132 condominiums on 12.5 acres of currently undeveloped lakefront land with a 75-slip marina.

NO DEVELOPMENT

Both developments are of major concern due to the obstruction of public lake access and views from the highway, the number and density of units proposed, the proposed major realignment of the scenic highway, traffic issues, air pollution, the large numbers of trees to be removed, destruction of eagle and endangered plant habitat areas, light pollution and an overload on community resources such as water and sewer.

Local Involvement: We work in cooperation with other groups and individuals around Big Bear Valley with similar goals for their own area.

Donations: Membership is free, however, we gratefully accept donations of up to $100 to assist with legal fees, mailing costs, and public relations materials.

Get involved today in making a difference in your valley—join us by sending your name, mailing address, phone and email to FoF!

friendsoffawnskin@yahoo.com

YOUR LETTER NOW WILL MAKE A DIFFERENCE

The Environmental Impact Report (EIR) study for Moon Camp is currently in process. We need as many people as possible to send letters to the County regarding your concerns over this development.
The letter deadline is March 22, 2002. Refer to project: *Environmental Impact Report (EIR) for Moon Camp TT #16136.*
Send letters to: County of San Bernardino, Advance Planning Division, 385 N. Arrowhead Ave., Third Floor, San Bernardino, CA 92415-0182, Attention: Tracy Creason, Senior Associate Planner.
For more information or a Friends of Fawnskin list of concerns, email friendsoffawnskin@yahoo.com or call 909-878-3091.

March 5, 2002

Dear Friend of Fawnskin,

Our organization and your efforts are already paying off! The County is now requiring that an Environmental Impact Report (EIR) be done on the Moon Camp property to evaluate the effect of the proposed zoning change and potential development. We also have succeeded in getting the attention of our County Supervisor, Dennis Hansberger. Donations from individual members of Friends of Fawnskin made a substantial addition to the value of his recent fundraiser and several of us discussed our concerns with him regarding the proposed developments at Moon Camp and Cluster Pines (Marina Point). He heard us "loud and clear" and has taken his staff by the properties to see what we are so concerned about. Thank you very much to all of you who have written letters to the County or given donations to FoF or the Supervisor!

The County has now hired the consulting company to do the Moon Camp EIR and they have begun gathering community input regarding concerns that need to be evaluated. It is imperative that as many of you as possible send letters to the County expressing your concerns about this proposed development. If you wrote a letter to the County on this issue previously, you can resend the same letter, but the County will not forward those original letters to the consultant for this study. It is very important that each of us writes an individual letter because *only those people that comment now will "maintain their standing" to be able to make comments in the future on the draft and final EIR.* The more individuals we have who can make comments, the larger impact we will have on the final results.

The deadline for receipt of letters is March 22, 2002. Letters should refer to project: *Environmental Impact Report (EIR) for Moon Camp TT #16136* and need to include your name and mailing address. Send letters to: County of San Bernardino, Advance Planning Division, 385 N. Arrowhead Ave., Third Floor, San Bernardino, CA 92415-0182, Attention: Tracy Creason, Senior Associate Planner. We have enclosed a detailed list of concerns to assist you in writing your letter.

We have also enclosed a copy of our Friends of Fawnskin position paper. We will be posting these in as many places as possible around the Valley to both gather more members and to get more people to write letters regarding this Moon Camp EIR. If you know places that will allow you to post it, groups where you can distribute them, or friends who would like a copy, please feel free to make as many copies as you like. If you have any questions, email friendsoffawnskin@yahoo.com or call 909-878-3091.

Please remember to get your letter in soon and thank you all very much for your continuing support.

Sincerely,

Sandy Steers and Buffy Francuz
for the Friends of Fawnskin Advisory Committee

Issues List Concerning Developing Moon Camp

(please include others that you are aware of in your letter, in addition to any you choose to use from this list)

- Air Quality
  There will be increased auto emissions due to increased number of cars and slower speeds caused by increased traffic congestion, increased emissions from fireplaces and wood burning stoves, as well as boat engines, ATV's, leaf blowers, and recreational vehicles, and cumulative air pollution from this and all projects around the valley, including during construction phase.
- Water Quality
  There will be additional runoff to the lake which is already saturated with fertilizer, etc. from runoff in existing landscaping and development areas elsewhere.
- Water availability (especially in drought times, which are a natural part of our climate cycle)
  There is currently a shortage of water and we are in drought conditions. In the late 80's and early 90's people were without water on major holidays in the summer and pressure was reduced on streets at higher elevations. A fire would have caused disaster. There is no more water in the valley now and 92 homes will certainly intensify the situation.
- Energy Factors
  Local electricity providers claim no more power lines can be added nor can solar power be used and that the valley is already short of the electricity it needs. Continuous building elsewhere in the valley, as well as this project, will continue to exacerbate the problem plus increase the chances of blackouts, etc.
- Sewer Capacity
  The manholes in the streets repaved during 2000 and 2001 have not been raised and if there are any problems, these manholes will have to be located and jackhammered out before anything can be done. Are the pipes in Fawnskin of sufficient capacity to handle additional homes? Cumulative sewer effects with all the developments proposed and in progress must be addressed. There are already sewer odors in some homes due to being overloaded and nothing has been done with these.
- Tree Removal
  The development expects the removal of 730 trees (25% of existing trees), which only addresses those to be removed to reroute the highway. How many additional trees will be removed to build homes? Plus how many will die due to stress of construction. The large, old growth trees removed will not grow back in our lifetime, so planting lots of replacement trees is not sufficient mitigation.
- Eagle Habitat
  Eagles use many of the trees throughout the entire Moon Camp area, not just a few trees along the shoreline. The whole Moon Camp area is eagle habitat. Eagle perch trees take hundreds of years to grow, saving a few existing trees will not provide habitat into the future.
- Wildlife Habitat
  This area is also habitat for blue herons, ospreys, hawks and waterfowl. Wildlife (deer, coyote) access lakeshore through property.
- Plant Habitat – This will destroy endangered/threatened habitat areas (pebble plains, wetlands) known only in Big Bear, as well as endangered/threatened flora in the area.
- Light Pollution/Glare – Additional lighting from 92 homes would greatly diminish the intensity of the nighttime sky.
- Medical Services – We have limited medical facilities, including ambulance service, inadequate for increased population.

- Fire Protection – The Fawnskin Fire Department is very small, inadequate for planned development.
- Time frame for Biological Assessment (are survey windows adequate/appropriate) – Due to seasonal changes in animal migration and living patterns, anything short of a one-year study will not fully assess the impact on animal life.
- Traffic Study –Traffic would increase dramatically with addition of Moon Camp, Cluster Pines, Brookside Road and the new Zoo. Holiday traffic is currently unacceptable in the valley. Weekend and vacation use/rental impact on traffic and parking should be addressed; multiple cars per house/unit. What are the cumulative effects of increased traffic in the town of Fawnskin, as well as Stanfield Cut Off and the south shore communities?
- Public Safety – Additional traffic increases danger to pedestrians and school bus stop/crossings in the downtown Fawnskin area where crossing the highway is necessary.
- Public access - Public access to the lakeshore would no longer exist, as development would be a private, gated community.
- Designated Scenic Highway – The scenic value of the highway would be removed since views from the highway would be obstructed by multiple home construction.
- School System - How will this impact the limited classroom capacity?
- Seismic Activity - A fault runs through Windy Point. Is there an issue with regard to earthquakes and the "seismic effect", as well as for the emergency personnel and equipment available in such an instance?
- Property Values - What impact will "high density" housing development have on property values near the property, as well as throughout Fawnskin?
- Noise - Localized effects (construction and long term) and cumulative effects (sound travels across lake)
- Lake Usage – Increase watercraft on lake due to 100-slip private marina. Additional watercraft also causes further lake pollution.
- Quality of Life –Fawnskin and the north shore have a serene ambiance, frequently characterized as quiet, natural, uncongested and lake-accessible. Proposed development would change the mountain character of the north shore from "country" living to "city" setting.
- City standards non applicable here
  "City" development standards should not be applied to Fawnskin. Impact comparisons should not be made with an urban area.
- Impact to South Shore and North Shore Communities – Loss of revenue to lodge owners and marina boat rentals. Impact of additional traffic, noise, etc. on the already overburdened South Shore communities.
- County Services – What impact on fire, sheriff, and sewer services?
- Environmental Terms & Conditions – County has a very bad record for not enforcing mitigation terms and conditions presently. Would there be any change?
- Developer's Track Record – The developer has a bad track record regarding adhering to mitigation terms and protecting areas developed. How would that be mitigated.
- Alternative Usage – Explore the potential to expand the National Forest lands as an alternative to proposed rezoning.
- Cumulative Effects – Increasing the population increases all the effects (the multiplier factor). The cumulative effect of developments at Moon Camp, Cluster Pines, Brookside Road, Deer Trail and the new zoo with the existing environment must be assessed collectively with regard to all issues. City development standards should not be applied. Mitigation should be site-specific to Fawnskin, not based on a model.

PEG ALLEN
P.O. BOX 23
FAWNSKIN, CA 92333
PH 909-878-4028
FX 909-866-1937

08/16/01

TO RCK PROPERTIES

ATTN: FILE/INDEX-GPA/TT/M331-8N/01/APN:0304-091-12*

FROM: PEG

THIS ARTICLE WAS PRINTED IN THE GRIZZLY BY A WOMAN WHO DOESN'T LIVE IN FAWNSKIN BUT HER ARTICLE SAYS IT ALL AS TO WHAT YOU WANT TO DO AND HOW IT WILL LOOK. AS IT IS WE HAVE A HARD TIME GETTING ONTO NORTH SHORE DRIVE OFF OF CANYON DURING THE SUMMER BECAUSE OF SO MUCH TRAFFIC. THOSE NEW HOMES WOULD JUST ADD MORE TRAFFIC PROBLEMS.

PEG ALLEN
878-4028

Harold Allen 3-20-02
Peg Allen 3-20-02

FAX PAGES SENT INCLUDING COVER SHEET
2

Big Bear's groundwater dependency increasing

By ELIZABETH STEVENS

A recent study of local groundwater resources and an increase in its use underscores the need to educate customers to conserve this most valuable of resources.

That was the message delivered in statistics presented at the city of Big Bear Lake Department of Water and Power commissioners' meeting on July 24.

A presentation by Dennis Williams and Tom Harder of Geoscience reported on the increase in the pumping of groundwater here over the past two years.

"We are convinced that this increase is due to the proliferation of massive landscaping projects by new home owners," Perry said.

This fact is not attributed to an increase in construction, Perry explained, but rather to the yards and gardens which surround new homes.

Perry said that he has been working with local landscapers and nurseries and has found them to be as eager as he to reduce excessive water usage.

"We are drilling new wells, working with the Big Bear Area Regional Wastewater Agency for use of reclaimed water for some watering needs, and investigating new technology for automatic watering systems which monitor the need to water, rather than the more customary automatic on-off timing system," he said.

(See WATER, Page A-2)

WATER

(Continued from Page A-1)

Geoscience's 1992 study determined that the DWP could safely extract 3,050-3,400 acre feet of groundwater in the Big Bear Lake, Moonridge, Sugarloaf and Erwin Lake systems.

The 2001 update places that figure of "safe yield" to be 3,370-3,530 acre feet per year. In order to extract that much, new wells will have to be drilled in the next five years to meet the increasing demand, Williams said.

Until 1998, the average increase in pumping production was about 1 percent; but in 2000 it was 7.4 percent more than the prior year, he noted.

At this rate, the stu shows that the lower s yield level of 3,370 acre f would be reached in th years and the upper "s level" of 3,530 acre feet, four years.

An action plan submitt by DWP General Mana Michael Perry includes p

N3 DEVELOPMENT [illegible]

(4)

Zoning change

EDITOR: I am writing to make people aware of a situation in Fawnskin that I just discovered Sunday morning.

There is a developer (RCK Properties, Inc.) that is attempting to change the zoning for the now undeveloped acreage east of Canyon Drive from Rural Living (40-acre minimum lot size) to Single Residential (7,200 square feet minimum lot size) with the intention of putting in 92 new homes.

The deadline that the County Land Use Services Department has set for receiving any comments on this change is Friday, Aug. 3.

Their requirements were to notify only those residents immediately adjacent to the property being developed, while I'm certain that everyone in Fawnskin would like to have sufficient notice to be able to give their opinions.

The development is planned to go all the way to the lake, to include 100 boat slips and to re-route North Shore Drive through the development, removing the hilly landscape and more than 700 trees.

Some of the potential problems: water usage and sewer systems in Fawnskin are already taxed to their peak levels; many new residences at the same time will increase the population of Fawnskin by more than 30 percent and the added fireplaces will increase air pollution; the estimated 900 additional automobile trips out of the area will add to traffic congestion and air pollution; the new housing will eliminate lake access and access to the Forest Service-owned land adjacent to the development.

These practical items do not even include the more delicate issues of the area being a bald eagle habitat, including endangered species.

To get the paper work necessary to comment on this, call Mike Williams at the county at 387-4168 (File No. SPA/TT/M331-8N/01/APN:0304-091-12), but remember, you must have comments in before Friday, Aug. 3.

Please assist us to let them know of our displeasure about this potential change and how everyone concerned was not notified in a reasonable amount of time to get comments in.

3-20-02

EIR MOON CAMP TT # 16136

1/2

THE DEVELOPER - R C K - PROPOSES TO STRAIGHTEN HIGHWAY 38 AS A SAFETY ISSUE. WHAT A HORRIBLE MISSTATEMENT! THIS DEVELOPER IS NOT INTERESTED IN SAFETY, BUT INSTEAD, IS INTERESTED IN MORE VERY HIGH DOLLAR LAKE FRONT PROPERTIES. (2) PRESENTLY EXIST ON THE WATER - RCK'S MOTIVE IS TO ADD (23) MORE LOTS ON THE WATER FRONT. MUCH MONEY IS TO BE MADE SELLING LAKE FRONT LOTS - SO MUCH SO THAT MOVING A STATE HIGHWAY IS AN INCIDENTAL COST.

IF SAFETY WERE TRULY IN THE BEST INTEREST, THEN I EXPECT THE HIGHWAY # 18 FROM THE DAM THROUGH BOULDER BAY AREA ON THE WAY TO THE CITY OF BIG BEAR LAKE, SHOULD AND WILL BE STRAIGTENED. THE BULK OF THE EIGHTY THOUSAND WEEKEND VISITORS, MOST OF THEM FROM LOS ANGELES AREA, USE THIS ROAD

MOST VISITORS AND RESIDENTS OF FAWNSKIN TRAVEL HWY 38 FROM THE DAM TO FAWNSKIN - ABOUT 4 MILES DISTANCE. AS YOU PASS THRU THE SMALL TOWN OF FAWN SKIN - GOING EAST - YOU WILL ZIG AND ZAG SHARPLY AS YOU PASS CAPTAIN JOHN'S MARINA. SHOULD NOT THE DEVELOPER STRAIGHTEN THIS HIGHWAY IN THE INTEREST OF SAFETY AS IT LEADS TO HIS PROPOSED DEVELOPMENT. HMMM ?? NO MONEY TO BE MADE THERE!

WE ARE A SEMI-REMOTE COMMUNITY WITHOUT LOCAL POLICE. SPEEDING CARS PASSING THRU FAWNSKIN USUALLY ARE NOT TICKETED AS THERE ARE NO COPS HERE. 900 MORE VEHICLES, ON A DAILY BASIS, MAKES A POOR SITUATION WORSE.

EIR MOON CAMP TT #16136 3-20-02

2/2

MANY OF THE VISITORS TO THIS MOUNTAIN AREA OF BIG BEAR AND FAWNSKIN COME HERE FOR THE WINTER TIME SNOW PLAY. MANY OF THE DRIVERS LIVE OFF THE HILL IN AREAS WHERE SNOW IS SOMETHING SEEN ON TELEVISION. THEY HAVE LITTLE OR NO CONCEPT CONCERNING THE OPERATION OF VEHICLES ON SNOW OR ICE COVERED ROADS. MORE ACCIDENTS ARE IMMINENT AS MORE VISITORS COME HERE. THIS AREA CANNOT HANDLE THE INCREASE.

A STRAIGHTENED ~~#~~ HIGHWAY (TRAVELLING WEST FROM THE NEW RCK DEVELOPMENT) HEADING INTO THE AREA OF FAWNSKIN MERELY ENCOURAGES SPEEDING UNTIL YOU ARRIVE AT THE SHARP TURNS AND LOSE VEHICLE CONTROL (WINTER CONDITIONS) AND SLIDE ACROSS THE NARROW HIGHWAY TO WRECK ANOTHER VEHICLE OR CRASH INTO A STRUCTURE, THE RESULT BEING BODILY HARM OR LOSS OF LIVES.

I SAY NO DEVELOPMENT ON A LARGE SCALE SUCH AS RCK PROPOSES, NOT NOW, NOT EVER!!

Harold Allen (RESIDENT)
39590 OAK GLEN ROAD PO BOX 23
FAWNSKIN CA 92333

END

SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS

Main Office
818 West Seventh Street
12th Floor
Los Angeles, California
90017-3435

t (213) 236-1800
f (213) 236-1825

www.scag.ca.gov

Officers: President: Supervisor Jon Mikels, County of San Bernardino • First Vice President: Councilmember Hal Bernson, Los Angeles • Second Vice President: Mayor Pro Tem Bev Perry, Brea • Immediate Past President: Mayor Ron Bates, Los Alamitos

Imperial County: Hank Kuiper, Imperial County

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Orange County: Charles Smith, Orange County • Jon Bates, Los Alamitos • Ralph Bauer, Huntington Beach • Art Brown, Buena Park • Lou Bone, Tustin • Elizabeth Cowan, Costa Mesa • Cathryn DeYoung, Laguna Niguel • Richard Dixon, Lake Forest • Alta Duke, La Palma • Shirley McCracken, Anaheim • Bev Perry, Brea • Tod Ridgeway, Newport Beach

Riverside County: Bob Buster, Riverside County • Jon Loveridge, Riverside • Greg Pettis, Cathedral City • Ron Roberts, Temecula • Jan Rudman, Norona • Charles White, Moreno Valley

San Bernardino County: Jon Mikels, San Bernardino County • Bill Alexander, Rancho Cucamonga • David Eshleman, Fontana • Lee Ann Garcia, Grand Terrace • Bob Hunter, Victorville • Gwenn Norton-Perry, Chino Hills • Judith Valles, San Bernardino

Ventura County: Judy Mikels, Ventura County • Glen Becerra, Simi Valley • Donna De Paola, San Buenaventura • Toni Young, Port Hueneme

Riverside County Transportation Commission: John Lowe, Hemet

Ventura County Transportation Commission: Bill Davis, Simi Valley

March 20, 2002

Ms. Tracy Creason
Senior Associate Planner
Advance Planning Division
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

RE: SCAG Clearinghouse No. I 20020123 General Plan/Official Land Use District Change, Conditional Use Permit and Tentative Tract No. 16136 ("Moon Camp")

Dear Ms. Creason:

Thank you for submitting the **General Plan/Official Land Use District Change, Conditional Use Permit and Tentative Tract No. 16136 ("Moon Camp")** to SCAG for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

We have reviewed the **General Plan/Official Land Use District Change, Conditional Use Permit and Tentative Tract No. 16136 ("Moon Camp")**, and have determined that the proposed Project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and California Environmental Quality Act (CEQA) Guidelines (Section 15206). Therefore, the proposed Project does not warrant comments at this time. Should there be a change in the scope of the proposed Project, we would appreciate the opportunity to review and comment at that time.

A description of the proposed Project was published in SCAG's **March 15, 2002** Intergovernmental Review Clearinghouse Report for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this Project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1867. Thank you.

Sincerely,

JEFFREY M. SMITH, AICP
Senior Planner,
Intergovernmental Review

SUBJECT; Environmental Impact Report (EIR) for Moon Camp TT #16136 3/20/02

ATTENTION: Tracy Creason Sr. Assoc. Planner

RECEIVED
MAR 2 1 2002

This letter is to voice my concerns about the proposed Moon Camp development.

1. The traffic on State route 18 is heavy now, how many cars will be added by this project ? & how much time will be added to our commute to Big Bear City / Lake?

2. The sewers are at their limit now ,what is proposed to be changed for the additional homes?

3. Most of the public lake access will be eliminated , what is proposed to correct this?

4. The lack of water for fire fighting is a problem, how will this be addressed?

5. How can the development be built in a Eagle habitat?

Sincerely

Dean & Louise Fox

39426 North Shore Dr.
P.O. Box 13
Fawnskin , Ca. 92333

Fox
P.O. Box 13
Fawnskin CA.
92333

COUNTY OF SAN BERNARDINO
ADVANCE PLANNING DIVISION
385 N. ARROWHEAD AVE.
THIRD FLOOR
SAN BERNARDINO, CA. 92415-0182

ATTN: TRACY CREASON.

RECEIVED
MAR 2 2 2002

March 20, 2002

County of San Bernardino, Advance Planning Division
ATTN: Tracy Creason, Senior Associate Planner

Subject: EIR for Moon Camp TT#16136

I am concerned that these issues be analyzed and disclosed in the Environmental Impact Report:

What effect will increased runoff pollution from the development's landscaping and paved areas have on water quality in already over-burdened Big Bear Lake?

Is there truly a sufficient supply of water for these houses from a finite supply in this arid valley? Can the existing sewer system handle the added burden?

How can the removal of vast numbers of old growth trees be mitigated, or even justified? Planting a sapling to replace a tree that took many human lifetimes to grow is not a solution.

What effect on wildlife will the removal of these trees have? Also, what effect on water habitat will the large increase in boating have?

What effect will increased watercraft use from a 100-slip marina have on Lake Pollution?

What effect will there be on public recreation when this gated community bars public access?

Finally, why doesn't San Bernardino County see the benefit to all the citizens in the county if they would work with the Forest Service to expand public lands, giving access to recreation in Big Bear for generations to come?

Thank you for your consideration.
Sincerely

John L. Barber III

John L Barber, III
PO Box 1494
Sugarloaf, CA 92386

DEPARTMENT OF WATER AND POWER

4

CITY of BIG BEAR LAKE INCORPORATED 1980

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MAR 2 2 2002

March 20, 2002

Tracy Creason
Senior Associate Planner
Land User Services Department
County of San Bernardino
385 North Arrowhead Ave.
San Bernardino, CA 92415-0182

RE: TENTATIVE TRACT MAP 16136 (aka Moon Camp)

Dear Ms. Creason:

I have attached a copy of the "Water Feasibility Study" for the above-mentioned project. The feasibility study was prepared by our engineer and outlines what improvements need to be made in order for our Department to serve water to this project

Section VIII (b) of the initial study (Hydrology and Water Quality) noted "no impact". This should be marked as "Potentially Significant Impact". Section. VIII Substantiation (b) also notes that "the project does not include any on-site wells"; however, there are actually two wells on-site which must be drilled/equipped and productive (and dedicated to DWP) in order for us to serve this project.

Ground Water supplies are limited in Big Bear Valley; therefore, those issues should be addressed when preparing the EIR.

Please let me know if you have any additional questions.

Very truly yours,

Dottie Saville
General Manager

G/CorresAdmin/MoonCampInitStdy

41972 Garstin Drive, P.O. Box 1929, Big Bear Lake, CA 92315-1929 (909) 866-5050 FAX (909) 866-3184

So & Associates Engineers Inc.

16209 KAMANA RD., SUITE 100 • P.O. BOX 1712 • APPLE VALLEY, CA 92307 • PHONE (760) 242-2365 FAX (760) 242-3083

March 13, 2002 137.0020-18

City of Big Bear Lake
Department of Water & Power
PO BOX 1929
Big Bear Lake, CA 92315-1929

COPY

Attention: Ms. Dottie Saville
General Manager

Reference: **Water Feasibility Study for Tentative Tract 16136 (APN# 0304-091-12,13 and 0304-082-04, Moon Camp Project)**

Dear Ms. Saville:

In response to City of Big Bear Lake Department of Water and Power (DWP) request and authorization, our staff has completed a system review and hydraulic analysis to prepare the water feasibility study for Tentative Tract 16136 . We are pleased to submit this Final Report (DRAFT) for your review and approval.

A. PROJECT DESCRIPTION

The proposed project is a housing development located in the Northeast 1/4 of Section 13, Township 2 North and Range 1 West. The proposed project will consist of 92 single family housing lots as shown in Figure 1-B. Each residential lot will be considered as one equivalent dwelling unit (EDU). The average day demand (ADD) and maximum day demand (MDD), based on the number of EDUs is estimated to assess the impact to the existing water system.

Water Demand: Using information from the water production and water sales, the average day water demand per EDU is approximately 450 gallons per day per EDU (gpd/EDU) for the Fawnskin area. The max-day demand as considered takes into consideration that water usage occurs over an 8 to 10 hour period each day.

Average day demand (ADD)	=	92 EDU x 450 gpd/EDU
	=	41,400 gpd
Maximum day demand (MDD)	=	2.5 x ADD/1,440 minutes per day
	=	103,500 gpd (72.0 gallons per minute)

So & Associates Engineers Inc.

16209 KAMANA ROAD, SUITE 100 • APPLE VALLEY, CA 92307
(760) 242-2365 • FAX (760) 242-3083

Fire Flow Requirements: The existing water distribution system was originally designed for about 750 gpm fire flow for two hours. The current requirement per the County Fire Department for the Fawskin area is between 1,000 gpm and 1,500 gpm depending on the building square footage . The fire flow may be further increased to 1,750 gpm in the future. As such, the water distribution system was analyzed to handle the maximum day demand of the proposed development plus fire flow up to 1,500 gpm.

Water Supply and Storage Requirements: The State Health Department requires storage to account for one peak day usage. The DWP typically experiences one peak day during a summer holiday when tourists and part-time residents become full-time users. The coefficient of 450 gpd/EDU and corresponding max-day demand is representative of that day and is the basis for calculating the water supply and storage required for the proposed project as presented in prior discussions and shown below:

Domestic water supply requirement (Max. Day)	= 72.0	gallons per minute
Operational Storage = (0.3 x MDD)	= 31,050	gallons
Emergency Storage = (1.0 x MDD)	= 103,500	gallons
Subtotal (without fire storage)	= 134,550	gallons
Fire Storage (1,500 gpm x 2 hours)	=180,000	gallons

Based on proposed project development requirements (at MDD), two new well(s) will be required to provide a minimum of 72.0 gallons per minute. Developer will be required to deposit funds with DWP for new well construction unless a proven source of supply is provided by the developer at locations satisfactory to DWP and not exceeding sub-basin safe-yields. It is our understanding that the developer is proposing to drill/equip two wells to DWP standards and dedicate these production wells to the Department. Further, within the proposed tract, no individual private irrigation wells will be permitted.

B. WATER DISTRIBUTION SYSTEM REVIEW

The proposed tract is located near the southeast side of Fawnskin which receives water from Cline Miller Reservoir based on the computer simulations. Figure 1-A attached shows the existing distribution piping system near the proposed development and the recommended extension pipeline layout. Referencing the hydraulic grade line of 6,957 feet elevation at Cline Miller Reservoir and the approximate ground elevation at project site from 6,780 to 6,800 feet, the minimum static pressure at the proposed parcel should be around 68 psi.

Under maximum day demands plus residential fire flow of up to 1,500 gpm, the minimum residual pressure of 20 psi can be met, based on the existing hydraulic pipeline model. However, the existing

Cline-Miller reservoir is an old 100,000 gallon concrete reservoir which will not be sufficient to serve the proposed project. The existing site has limited room for a new tank without demolishing the old tank and/or securing additional property. Therefore, we are recommending that the old concrete reservoir be replaced with a new 300,000 to 400,000 gallon storage reservoir. The developer will be required to advance funds towards construction of the new reservoir and 12-inch transmission pipeline.

C. ESTIMATED COST OF SYSTEM IMPROVEMENTS

On-Site Facilities: The owner or developer of Tentative Tract 16136 will be entirely responsible for all costs of internal facilities. On site distribution pipeline must be 8-inches diameter minimum. All site facilities (plumbing, piping, etc) must also meet the requirements of CBBL-DWP, and San Bernardino County Building & Safety Department.

Off-site Facilities: The property owner or developer is responsible for advancing funds towards the construction of a new reservoir (300,000 gallons minimum) at Cline-Miller and the associated 12-inch pipeline. The estimated probable project costs are as follows:

- Construction of a 300,000 gallon (min.) replacement reservoir = $120,000 *
- Construction of about 2,780 lineal feet of 12-inch pipeline = $250,000
- Allowance for project contingency, engineering, and administration = $111,100

- Estimated total probable project cost = $481,100.

*DWP may participate to make it a 400,000 gallon tank.

Water Supply Source: As discussed earlier, the project developer is in the process of drilling/equipping two wells to meet the project's max-day demand.

Connection Fee: The proposed project is required to pay the DWP connection fee (currently $4,086/ EDU) in order to mitigate the project's impact on the existing water system. Based on the estimated 92 EDUs referenced in this report, the total project connection fee is estimated as follows:

92 EDU's X $4,086/EDU = $375,912.

Because the project developer is proposing to drill/equip wells to DWP standards, and will be required to advance funds towards constructing a new reservoir and off-site pipeline, waiver for components of the normal connection fee (source, storage, transmission) discussed above should be discussed with DWP. Any other component of the above $4,086/EDU connection fee will be paid when the developer applies for connection and water service to the DWP system. Additional fees such as plan check, inspection, and monthly user fees are determined by the DWP at the time of application for service.

So & Associates Engineers Inc.
16209 KAMANA ROAD, SUITE 100 • APPLE VALLEY, CA 92307
(760) 242-2365 • FAX (760) 242-3083

D. SUMMARY

The proposed project (Tentative Tract 16136) can be served by the Department's water system in the Fawnskin area provided that the project developer meets with the following requirements:

- Submit water plans (on-site) for review/approval by DWP to make sure that water mains do not conflict with the BBARWA 10-inch sewer force main (which will be relocated at developer's cost).

- Drill and equip the two supply wells to DWP standards and dedicate these facilities and water rights to DWP. Within the proposed tract, no individual private irrigation wells will be permitted.

- Advance funds towards constructing new reservoir and pipeline improvement at Cline-Miller (with an estimated project cost at $481,100) and dedicate these facilities to the Department of Water & Power. If other parcels of land can be benefited by the off-site improvements based on review by DWP's engineer, a "reimbursement agreement" will be considered by DWP.

- Pay other component (except source, storage, and transmission) of the connection fee to DWP at the time of application for water service for specific subdivided parcels.

- Pay plan check, inspection, and water meter installation charges as discussed in this feasibility study report.

- DWP encourages low water usage landscape designs (turf limitation) to achieve water conservation. This may in turn lower the water supply demand. The developer is required to submit landscaping plans for review with DWP.

Information provided in this letter report is valid for a period of one year from the date of the Final Feasibility Report. The above water connection fee and estimated improvement costs will be subject to further inflationary adjustment depending on commencement and completion of the project. We trust that information in this report will be helpful to both the DWP and the project developer.

Very Truly Yours,

Wilson F. So., P.E.
Project Engineer

March 20, 2002

RECEIVED
MAR 25 2002

Planning Division
County of San Bernardino
385 North Arrowhead Ave,
San Bernardino, CA 92415-0182

Attention: Tracy Creason,
Ref: Environmental Impact Report (EIR) for Moon Camp TT#16136

How many trees will be lost between the new Highway 38 and the lake for the complete project—new roads and the buildings? The 24% estimate is too low when considering the view from the highway.

If we look at the trees removed at or below the proposed highway 38, over 50% of the trees will be lost to development. Since the lots below the highway are smaller and most likely will have the largest houses, more trees will be lost. Building on the lots will require the footprint of the house, plus the garage, parking and driveway, plus a minimum 3-foot setback to protect remaining trees. Also, from my experience, additional trees will be lost due to accidents. Several trees died from shock in front of the new Sav-On drugstore on the other side of the lake after the project was completed.

My estimate is that 65% of the trees on the lower viewable portion will be lost. The loss of so many trees, and with new homeowners planting fast growing trees, such as poplars, the view and the environment will have significant changes.

Will all of these factors be considered in the EIR?

Lee Whitney Marilyn Whitney

Lee & Marilyn Whitney
39784 Flicker Rd. PO. Box 37
Fawnskin, CA 92333

March 20, 2002

RECEIVED
MAR 25 2002

Planning Division
County of San Bernardino
385 North Arrowhead Ave,
San Bernardino, CA 92415-0182

Attention: Tracy Creason,
Ref: Environmental Impact Report (EIR) for Moon Camp TT#16136

Does the traffic model used in the Traffic Analysis by Kunzman Associates match the actual traffic patterns encountered in Big Bear?

The traffic analysis appears to be based on weekday traffic patterns. I question using standard Federal and State methods to calculate traffic patterns in the Big Bear Valley. Traffic during peek weekends and vacation periods are several times greater than weekday traffic.

Can the data be validated? Local population growth for the 1990's was low. Since 1989 Big Bear Blvd. was widened, we had an earthquake, and Big Bear had a recession. By 1999 the area was just recovering. New timeshare developments are being added at "The Club." Also, the Castle Glen and other developments have been added along Starvation Flats.

The extra lane going east on Big Bear Blvd. should help on weekdays. I think there is a much larger problem with traffic going into Big Bear Lake during weekends. It must be very difficult to develop a traffic plan averaging weekday and weekend traffic. Is this considered in the EIR?

I wonder about the validity of the entire report when there are obvious errors. A compound growth rate of 3% for 19 years, is (1+. 03)^19=1.75 or 75% growth. The report stated that the compound growth was 57%.

Lee Whitney Marilyn Whitney

Lee & Marilyn Whitney
39784 Flicker Rd. PO. Box 37
Fawnskin, CA 92333

PUBLIC COMMENT FORM

RECEIVED
MAR 2 1 2002

PROJECT NAME:

Environmental Impact Report (EIR) for Moon Camp TT #16136.

NAME AND ADDRESS OF COMMENTOR: (include group or public agency affiliation, as applicable)

PETER E. MEDELLIN
13520 FENTON AVE
SYLMAR, CA. 91342-3010

FAWNSKIN HOME OWNER - ADDRESS 39527 NORTH SHORE DRIVE. FAWNSKIN, CA.

Telephone Number: 818-367-8405

COMMENTS:

Please provide your comments on potential environmental issues/impacts which you feel should be addressed in further detail in the EIR. Attach additional pieces of paper, as needed.

This form and/or additional comments can be submitted at the Scoping Meeting or mailed to the County of San Bernardino, Advance Planning Division, 385 N. Arrowhead Avenue, Third Floor, San Bernardino, CA 92415-0182, Attention: Tracy Creason, Senior Associate Planner.

Letter attached

TRACY CREASON, SENIOR ASSOCIATE PLANNER
Advance Planning Division
County of San Bernardino, Ca. 92415-0182

Dear Sirs

My name is Peter E. Medellin. My home address is 13520 Fenton Ave. Sylmar, Ca. 91342. My home telephone number is 818-367-8405.
My part time residence in the Big Bear area is 39527 North Shore Drive. Fawnskin, Ca.92333.

This letter is intended to voice my concerns of the Moon Camp TT #16136 project and the Environmental Impact Report concerning this project.

I have many concerns regarding this proposed project. The biggest concern that I have is that this property is currently zoned for single residence 40 acre lots and should remain that way. The reason that I decided to purchase my vacation home in Fawnskin is that the area was open and not overbuilt as the south side of the lake currently is. 40 acre lots would insure that overbuilding would not occur and that the area would remain open with trees and that open country look.

With the rezoning of the area to smaller lots and the crowding of more homes in the same area I see many environmental problems.
Tree removal.-- A lot of trees will have to be removed to accommodate the proposed 93 homes on the rezoned smaller lots. These trees will require at least 100 years to grow to the same size that they are today.
With the added homes there will be an impact on the air quality. More cars, more traffic, more trash, and more noise.
Water Quality.—There will be more pollution to the lake with more homes and cars having water runoff going to the lake.
Energy, Water, Sewer, and Gas.-- I have heard that electrical power may not be adequate for the new homes. The sewer lines may not be able to cope with the additional sewage. Water is already in short supply as it is now without adding an additional 92 more users. I am not sure what negative impact this will cause the gas lines or existing gas supplies.
With the removal of so many trees, this will have a big impact on the wild life of the area. The eagles will loose many nesting trees and the wildlife will loose their nesting trees and food sources and habit.
Another concern is the Fawnskin Fire fighting capacity, the local hospital, and emergency services required to support the added 92 residents, these are now marginal and will not be adequate for the added residents.
Another big concern to me is the access to the lake. If the project is allowed to go on as planned, then the public will be shut out of this area. This project is planned as a gated community which means that access to the lake will be denied to the public.
Boat Marina.—The boat marina will bring added traffic, noise, water pollution, congestion, congestion on the lake and other unforeseen problems.

Scenic drive on the north shore-- The beauty of the area will be negatively impacted by a row of housed along the shore line. As you look from the new proposed road towards the lake all you will see is the back side of many homes along the lake with the view of the lake blocked completely or partially.

It is my opinion that this project is way to big for the area and that it will drastically change the quality of life for all of the current residents of Fawnskin. This project will also ruin the natural beauty of the existing forest as it now stands.

Please keep me advised of all future meetings regarding this proposed project. I am very concerned with the proposed project and the future of Fawnskin, Ca.

Peter E. Medellin

County of San Bernadino
Advance Planning Division
385 N. Arrowhead Ave., Third Floor,
San Bernadino, CA 92415-0182
Attention: Tracy Creason, Senior Associate Planner

March 21st 2002

Re: Proposed Moon Camp Development TT #16136, in Fawnskin, CA

Dear Ms Creason:

We are property owners on Crags Lane in Fawnskin (Parcel 0304-185-31-0000). We purchased this property for our personal use and enjoyment and would like to see the area maintain its current environment as much as possible.

We are thus concerned that the impact of the referenced project be considered extremely carefully in relation to the future environment of Fawnskin, the North Shore of Big Bear Lake, the lake itself and all surrounding cities.

Areas with limited rainfall and thin soils characteristic of Big Bear Valley have a very fragile environment. Any human population can damage that environment permanently. Any increase in population allowance and construction must be planned with incredible care if the subsequent long term impact is to be minimized. We thus urge the utmost care and attention to detail in both formation and review of the Environmental Impact Report for this proposed development.

This development, which we understand proposes 92 homes on undeveloped lakefront land and a 100 slip marina in the lake represents a major change in the current status and can result in major environmental impact. The proposed development appears to require: scenic highway realignment, destruction of many trees, and removal of land from eagle and other wildlife habitat. It is unclear how any form of mitigation could work to replace these since undeveloped shoreland cannot be "recreated". Any study must include realistic estimates of long term as well as short term effects on natural habitat and lake and shore species. This could require extensive new studies of the area to provide reliable background information especially as old data may be incorrect in a newer "drought controlled" period with the lower lake water levels that we are experiencing.

Such development also appears to constitute a major departure from past practice which has been to reserve the North Shore for low density housing and public use such as National Forest land, public launching sites, lake access, and scenic enjoyment. This change must be acknowledged in any environmental review/mitigation plan since such amenities may be irreplaceable once lost. The increase in necessary public services in this area, including water, power, sewage, fire service, etc., will be extensive and require upgrading whose impact must be considered.

We have addressed only some of the issues that should be contained in an adequate EIR. I hope that you are in a position to ensure that it addresses these and all other issues of concern so that a well informed decision regarding this proposed development can be assured.

Sincerely,

Ann and George Miller
Mailing address: 12 Perkins Court, Irvine CA 92612
Property Address: 1201 Crags Lane, Fawnskin, CA 92333

FAX to 909-387-3223 Tracy Creason/ Advanced Planning

To Whom it May Concern,

I would like to address an issue regarding:

Environmental Impact Report for Moon Camp TT#16136

Although there are numerous points to argue against this project, the biggest impact on the area would be the removal of over 700 trees as a starting point to reroute the highway. What percentage of the trees that are currently on the property does this equate to? How many additional trees would be removed at future dates for construction, access, and "convenience"? What stress levels would the remaining trees encounter due to construction and general increased activity? Will these additional stress levels and other factors from the development of this area make the remaining trees more susceptible to bark beetles? What is the likelihood that some percentage of the remaining trees will die within two years of the development completion due to these factors and what percentage would be projected for this event?

The cumulative affect of all of this is a loss of a large number of old growth trees and this affect cannot be offset by planting new trees. The effects of cutting this string from the intricate web of life would reverberate for decades on our plant and animal life and deeply affect a way of life that the residents have sought out by moving here. What long range effects, for the next several decades, are expected to the residents and to the wildlife from the destruction of these trees? How will these effects be mitigated for now and for the next several decades? How will the cutting of these trees and the resulting changes effect property values of the homes in the immediate area and throughout Fawnskin?

Thank you for your consideration in this matter.

Jonathan Nourok

Jonathan Nourok
P.O. Box 142
Big Bear City, CA 92314
909-585-5355

Steve Nunez
P.O. Box 142
Fawnskin, CA 92333-0118

COUNTY OF SAN BERNARDINO
ADVANCE PLANNING DIVISION
385 N. ARROWHEAD AVE. THIRD FLOOR
SAN BERNARDINO, CA 92415-0182

ATTENTION: TRACY CREASON,
SENIOR ASSOCIATE PLANNER

92415-0182

SAN BERNARDINO CA
20 MAR 2002
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92434

County of San Bernardino
Advance Planning Division
385 N. Arrowhead Ave.
Third Floor
San Bernardino, CA 92415-0182

RECEIVED
MAR 2 1 2002

Attention: Tracy Creason,
Senior Associate Planner

Subject: Enviromental Impact (EIR) for Moon Camp TT #16136

From: Stephen Roy Nunez
P.O. Box 118
Fawnskin, CA 92333

Dear Creason,

As full time twelve year resident of Fawnskin I have very important enviromental conerns. We are now in the fourth year in drought time and in drought conditions. With the addition of 91 or more new sewer connections is BBARWA at the present time capable of wastewater treatment and conveyance. Do we have adequate storage? Does the EIR analysis cover proper and adequate protection of the enivirorment and health of my community, Fawnskin?

In regards to water availability, what does the addition of Moom Camp residences mean to me, in Fawnskin, in terms of loss of water as I know it today? Possible reduction in fire protection; increased fire danger and maybe result in higher futre water costs?

Other concerns are loss of scenic value from the highway because of multiple home construction and re-routing of the highway;

I choose to live out my life in Fawnskin because of the serene ambiance, characterized as quiet, natural, uncongested and lake-accessible. The proposed development would change the mountain character of the north shore enviroment to "city" setting. What impact will high density housing development have on property values near the development, as well as Fawnskin?

Sincerely,

Stephen Nunez & Yvonne Nunez

Stephen and Yvonne NUNEZ

THE RIM OF THE WORLD TRAILS ASSOCIATION

POST OFFICE BOX 1459
RUNNING SPRINGS, CA 92382
909-867-4063

March 21, 2002

County of San Bernardino
Land Use Services Division
385 North Arrowhead Avenue
San Bernardino, CA 92414

Att: Tracy Creason, Senior Associate Planner

RE: General Plan Amendment/Official land Use District Change, Conditional Use Permit and Tentative Tract No. 16136 (Moon Camp)

The Rim of the World Trails Association comments are focused to the Recreational Section of the Initial Study. Section XIV of The Initial Study limits its comments to water related recreation and fails to include the impact to any future extension of the Alpine Pedal Path around Big Bear Lake.

Several campgrounds and picnic areas are located in the Fawnskin area. Visitors who enjoy these facilities and add to the economic well being of the community walk the shoreline, and the forest areas on existing pathways. Additionally, residents currently walk the shoreline in this area, and the construction of private docks would prohibit any trail or trail related use in this area.

An area of shoreline currently enjoyed by the public would be removed for private use by this project reducing the access and use of a public lake. The Trails Association would suggest that this recreational activity (walking, bicycling etc.) should not be removed from the community, but the extension of the Alpine Pedal Path should be included in the design of this project as well as trails throughout the project benefiting not only project but the community as a whole.

The Rim of the World Trails Association appreciates the opportunity to submit our comments on this project.

Respectfully,

Carol Sebastian
President
ROWTA Board of Trustees

PHONE: 909-867-4063
FAX: 909-867-2182
ALA@JS-NET.COM

Scott A. Eliason
Botanist
PO Box 309
Fawnskin, CA 92333
March 21, 2002

Tracy Creason, Senior Associate Planner
Advance Planning Division
385 North Arrowhead Avenue
San Bernardino, California 92415-0182

Re: Notice of Preparation of Environmental Impact Report, RCK Properties

Dear Ms. Creason,

These comments are in response to your Notice of Preparation dated February 20, 2002, regarding proposed development of the Moon Camp property. Please refer to the two attached letters submitted in response to the Project Notice for this action. These letters are dated July 31, 2001 from Robin Butler (now Robin Eliason), and August 1, 2001 from Scott A. Eliason. The content of these two letters are incorporated herein by reference, and we request that the issues raised in these letters be addressed in the body of the Draft EIR, and specifically in the Response to Comments section.

In addition to these letters, we request that alternatives be advanced and evaluated in the DEIR that would 1) avoid loss and assure long-term preservation of on-site pebble plain habitat, 2) avoid loss of bald eagle perch trees and foraging habitat. An alternative (or range of alternatives) should also be presented that involves transfer of the property (in whole or in part) to the San Bernardino National Forest for use and enjoyment by the public, and for the conservation of sensitive biological resources.

Thank you for the opportunity to comment on this proposal at this stage. We look forward to receiving a thorough and thoughtful analysis of this project in the DEIR.

Sincerely,

Scott A. Eliason
Botanist

2 Attach.

Scott A. Eliason
Botanist
P.O. Box 309
Fawnskin, California 92333
August 1, 2001

Mike Williams
San Bernardino County Land Use Services Department/Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, California 92415-0182

Re: PN: RCK Properties, File/Indx: GPA/TT/M331-8N/01/APN:0304-091-12*

Dear Mr. Williams:

The following are my comments to the above-mentioned Project Notice regarding a development proposal in Bear Valley (Fawnskin), San Bernardino County, California. I am providing these comments as a concerned resident of the Community of Fawnskin, as well as a recognized expert on the botany and biology of Big Bear Valley. The property at issue is the 62.43-acre parcel known as Moon Camp. The proposal involves a general plan/land use district amendment rezoning the parcel from a 40-acre minimum lot size to a 7200 square foot minimum lot size. It also involves a 92-lot subdivision of the 62.43-acre parcel.

Habitat on the Moon Camp parcel is known to support listed threatened and endangered species, sensitive habitat types, and numerous rare plants and animals. It has not, to my knowledge, been thoroughly surveyed for biological resources. The total extent to which threatened and endangered species occupy the parcel is not known, and the full complement of species supported is not known. I have reviewed the Biological Assessment dated August 10, 2000, and have found the report to be inaccurate and incomplete.

Many of the trees on the parcel are known to be used as day roosts and perches by wintering bald eagles, and the lakeshore is used for essential feeding behavior. The bald eagle is fully protected under the federal and state Endangered Species Acts, and the federal Bald Eagle Protection Act. Development of this parcel will likely have adverse effects to the wintering population, and may directly or indirectly result in take of bald eagles through disruption of essential foraging and feeding behavior. If bald eagles nest in Bear Valley in the future, development and resulting intense use of this area may also disrupt essential breeding behavior.

The Moon Camp parcel is known to support a large and important occurrence of the threatened ash-gray paintbrush (*Castilleja cinerea*), which occurs in a dense and patchy distribution over much of the entire parcel. This occurrence is documented in the California Natural Diversity Database (occurrence #24). This species is associated with pebble plains habitat. Numerous sensitive pebble plain plant species are known/likely to occur on the parcel, including several species determined to be absent in the August 10 Biological Assessment. Mountain meadows and mesic habitats occur along the lakeshore and along seasonal drainages crossing the parcel, and like the pebble plains, are readily visible from North Shore Drive.

Willows that occur along the lakeshore meadow margin may provide suitable habitat for the state and federal endangered southwest willow flycatcher. Similar habitat around Grout Bay, ½-mile to the west, is known to support this species during the breading season.

The threatened southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*) and threatened Bear Valley sandwort (*Arenaria ursina*) are known to occur in pebble plain habitat on National Forest land adjacent and north of Moon Camp, and may occur at Moon Camp. Like the Bald Eagle, the threatened southern mountain buckwheat is not mentioned in the Biological Assessment. Meadow habitat along the shoreline may support listed endangered plant species, including bird's foot checkerbloom (*Sidalcea pedata*), slender-petaled mustard (*Thelypodium stenopetalum*), California taraxacum (*Taraxacum californicum*), and San Bernardino Mountains bluegrass (*Poa atropurpurea*). The taraxacum is known to occur in similar lake-margin meadow habitat approximately ½-mile to the east of the parcel, and the checkerbloom has a non-specific historic record for the Fawnskin area.

Development of this parcel in 92 lots will likely result in the complete destruction of the important occurrence of ash-gray paintbrush. Such impacts to this species, to the bald eagle as described above, pebble plains habitat, meadow habitats, and associated sensitive species should trigger findings of significance under the California Environmental Quality Act, and may not be mitigable. Loss of pebble plain habitat and an important occurrence of ash-gray paintbrush would be difficult if not impossible to mitigate to below the level of significance. Should this development proposal go forward, a complete Environmental Impact Report is needed to fully analyze and disclose significant impacts. A thorough biological resource analysis must be performed, including protocol surveys for southwest willow flycatcher, complete and accurate wildlife and botanical surveys, and an analysis of expected impacts to habitats, plants, and wildlife on adjacent lands.

I appreciate the opportunity to review this project notice, please add me to the distribution list for all environmental documentation and notices related to this project, and any future projects affecting the Community of Fawnskin.

Sincerely,

Scott A. Eliason
Botanist

Dennis Large'
P.O. Box 110417
Big Bear Lake, California 92315
Phone: (909) 878 - 3465 Fax: (909) 878 - 5965
email: dmlarge@compuserve.com

DATE: MARCH 22, 2002

TO: MS. TRACY CREASON

NUMBER OF PAGES: 3 (INCLUDING COVER)

REMARKS: RE: EIR FOR MOON CAMP
TT # 16136

PLEASE ACCEPT THE ATTACHED AS PART OF THE RECORD.
THANKS!

D. Large'

Dennis M. Large'
P.O. Box 110417
Big Bear Lake, California 92315
Phone: (909) 878-3465 Fax: (909) 878-5965
Email: dmlarge@compuserve.com

March 21, 2002

VIA FAX

Ms. Tracy Creason, Senior Associate Planner
County of San Bernardino
Advance Planning Division
385 N. Arrowhead Avenue, Third Floor
San Bernardino, California 92415-0182

RE: Environmental Impact Report For Tentative Tract No. 16136 (Moon Camp).

Dear Ms. Creason:

Thank you for holding the recent hearing in Big Bear Lake on the above referenced matter. This letter will supplement my remarks at the hearing regarding the scope of the pending Environmental Impact Report (EIR) and I wish included for the record.

First, an adequate EIR should encompass a full analysis of the environmental consequences of both the Moon Camp project and the adjacent proposed Marina Point Development project. A site-specific EIR would segment any potential cumulative environmental consequence and undermine the purpose for conducting an EIR in the first place.

The similarities of both proposed projects provide a basis for evaluating their environmental consequences together. Geographically, the proposed projects are in the same general location. Both propose similar land use development for high-density housing/condominium units and use of lake recreation resources in the form of a private yacht club and marina. Additionally, development of both projects would be approximately concurrent in time.

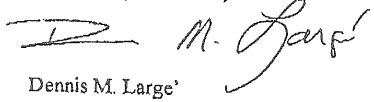
Second, an adequate EIR should include an analysis of alternatives available to the project developer for achieving the desired goals in another manner for the proposed project. Further, the EIR should contain a no-action alternative analysis. Inclusion of alternatives would ensure that the public and the appropriate governmental agencies

involved in this project have been provided full environmental disclosure by the project developers.

Lastly, an adequate EIR should be based on real-time observation and analysis. The project development area is a four-season area and undergoing significant environmental changes on a yearly basis. Types and kind of air quality vary with climate conditions. Traffic conditions are subject to weekend and holiday loads. Lake water levels are constantly changing and pollution concentration levels change accordingly.

The Lake District is currently working with the Santa Ana Regional Water Quality Control Board on a Storm Water Pollution Prevention Plan and involved in the TMDL (Total Maximum Daily Load) process. Consequently, any EIR should include a detailed analysis of pollutant runoff before, during and after project construction.

Respectfully submitted,



Dennis M. Large'

965 DEER TRAIL
FAWNSKIN, CA 92333

March 22, 2002

VIA FACSIMILE 909 387-3223
ORIGINAL VIA U.S. MAIL

Land Use Services Department
Attention: Tracy Creason, Senior Associate Planner
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

Re: Notice of Preparation of Environmental Impact Report;
Application of RCK Properties, Inc. concerning Tentative Tract Map 16136, Proposed General Plan Amendment, Land Use District Change and Conditional Use Permit
(Fawnskin Community)

Ladies and Gentlemen:

I am writing to request that the environmental impact report concerning the project/application described above, and your department's consideration of both the report and the applications, take into consideration the factors discussed in this letter.

The proposed project contemplates converting a significant part of the private open lake-shore property from rural zoning and use to a densely populated use more typical of urban areas. How would this change affect the environment, not only of Fawnskin, but of the entire Big Bear Valley, in the areas discussed below? What actions should the proponents of the changes be required to take to mitigate or offset the impact of this change?

1. What restrictions should be placed on light fixtures, both on structures and on roads, paths or marinas, to limit or avoid light pollution? One aspect of rural living is the absence of glare from light fixtures, which permits stars, comets and other astronomical phenomena to be observed. Nocturnal animals, birds and fish are likely to be disturbed, and their feeding and other habits altered, by increased lighting, especially if a marina is built.

2. Will the views of residents on the south shore, and visitors to south shore hotels and restaurants, be adversely affected in the day time by replacing trees with structures, and at night be increased glare, obscuring views of mountains and the night sky?

3. What will be the impact of increased traffic on Highway 38 and on Highway 18, both below the Big Bear Lake dam, and across and through the Stanfield cut-off? There is already extreme traffic congestion on weekends and holidays on the cutoff and on the

highway at least through the Running Springs community. Should the proponents be required to widen Highway 18 above the Snow Valley area, or to provide turn-outs or parking areas so that the additional traffic generated can be accommodated?

4. Will the increased traffic from the proposed change exacerbate existing air quality problems, especially on days when a temperature inversion occurs? Please consider both carbon dioxide/monoxide, ozone, incompletely burned fuel and particulates. Will increased emissions affect the health of residents and visitors, of wildlife, of plants, especially trees? What will the short-term and long-term effect on the national forest be, especially considering the impact and stress from emissions now "blowing in" from areas below?

5. Will the loss of trees from the proposal, from cutting them down to relocate the road and for construction, and from noise, air quality deterioration, traffic vibration, compaction of soil affecting root zones, withdrawal of water by the proposed wells and other factors affect the forest environment? Can the loss of mature trees be mitigated? Please consider increased soil erosion and alteration of the habitat for smaller plant species.

6. Will the project's proposed wells affect the water table for adjacent natural forest areas, including the meadows, and/or affect the amount of runoff, both surface and sub-surface, entering Big Bear Lake? Will this impact the lake's salinity or its clarity?

7. Will the proposed marina impact water circulation in the lake generally or Grout Bay in particular? Will it lead to increased siltation or to a deterioration in water clarity? Will marina use increase noise pollution, and how will this impact plant and animal life, including feeding and migration patterns? Should marina use be restricted in terms of hours, for example, daylight versus night, or in terms of seasons? Should marina use be prohibited, or certain uses (such as jet skis) be limited, especially during the times when access to Grout Bay and adjacent areas is currently prohibited or limited? Should lighting be restricted to avoid "light pollution"? Should refueling and servicing of water craft be prohibited to avoid contamination of the lake environment? What steps are needed to mitigate the impact of waste disposal or spillage from the contemplated marina?

8. Will water craft emissions contribute to air quality deterioration such that the marina should be eliminated as a condition to approval?

9. Should fireplaces be prohibited or limited to those not burning wood? Particulate emissions in areas with similar inversion characteristics such as Telluride, Colorado, have led to rules prohibiting the use of wood-burning stoves or fireplaces for entire days or more extended periods. Many residents of the valley now heat their homes by wood stoves or fireplaces. Will the proposed project's emissions pose a risk of similar bans? How will this impact the health of residents who see their use of wood for heat curtailed? How will the economic impact on these residents be addressed?

10. Will increased traffic cause air emissions to increase, especially from idling of engines stopped in traffic? Will this affect the national forest and endangered plant or animal species?

11. Will increased vehicle and foot traffic adversely affect recreational use of the nearby campgrounds on federal land or the usability of hiking and bicycle trails? Please have the report consider noise, dust, glare and soil compaction, as well as air and water quality.

12. What will the impact of increased, dense housing be on landfills, trash disposal areas, sewer facilities and storm water runoff? Will more trash disposal sites be needed?

13. Will increased traffic endanger those who presently walk or bike along Highway 38? Since the proposal plans to move the road inland, away from lake views, and to put up walls or structures which will obstruct the view of those using the road for recreational uses such as hiking or biking, should the proponents be required to restore the existing recreational uses of the highway by a hiking or bike path along the lake front?

14. Are existing water, gas and electrical grids adequate? Will improving them disrupt further the level of service to others or the rural quality of nearby areas?

15. Will removing over 700 trees adversely affect roosting and feeding patterns of eagles and other raptors? Will it affect air circulation, habitat for smaller animals or water absorption?

16. Will creating a walled community establish barriers for wildlife access from the forest to the lake, or barriers to the migration of plant species, or divide existing habitat into non-sustainable parcels?

17. Will the grading and road re-location proposed affect the stability of adjacent slopes or increase rates of erosion?

18. Will dredging be required for the contemplated marina? Will this stir up sediments, and if so, what will be released? How will this impact water quality and aquatic plants or animals? Will periodic re-dredging be needed and what noise, air pollution and silt effect will result? What will the disposal of dredged material do to soil quality?

19. Will recreational use of the lake and Grout Bay be adversely impacted by increased boat traffic or by construction activities, including noise? Will long-term recreational use of the lake be negatively affected by displacing natural views with structures and by increased traffic and glare from residences?

20. Will the project require expansion of existing schools and what impact will this expansion have on traffic, the amount of open space, water and sewer systems and the like?

21. Please have the report consider the cumulative effects on the factors described above of this project, the proposed zoo relocation, the proposed Cluster Pines development and other already-approved developments. I am concerned that the incremental effect of this project will magnify the effects of these other matters and dramatically affect the visual aspect of the lake's north shore.

22. Please have the report consider alternatives, including a less-dense project, a project without a marina or a walled community, a project which avoids lake-front development and leaves views from the road (Highway 38) unobstructed, a project that removes fewer trees and avoids the earth-moving involved in highway relocation, and other uses which minimize the degradation of recreational and wildlife uses. In doing so, please consider that recreational uses are a major economic activity of the entire valley, and that business and job opportunities for residents of the south shore will be adversely affected if recreational uses are curtailed, since there is little or no lake shore access on the south shore. Finally, please have the report reflect that existing recreational patterns have developed under a general plan and zoning scheme calling for rural residences on 40-acre parcels.

Thank you for considering this letter. I will be monitoring the progress of the study.

Very truly yours,

Peter J. Tenhyson
965 Deer Trail
Fawnskin, CA 92333

695 Town Center Drive, 17th Floor
Costa Mesa, CA 92626-1924

965 DEER TRAIL
FAWNSKIN, CA 92333

RECEIVED
MAR 2 5 2002

March 22, 2002

VIA FACSIMILE 909 387-3223
ORIGINAL VIA U.S. MAIL

Land Use Services Department
Attention: Tracy Creason, Senior Associate Planner
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

Re: Notice of Preparation of Environmental Impact Report;
Application of RCK Properties, Inc. concerning Tentative Tract Map 16136, Proposed General Plan Amendment, Land Use District Change and Conditional Use Permit
(Fawnskin Community)

Ladies and Gentlemen:

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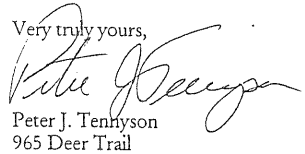
Thank you for considering this letter. I will be monitoring the progress of the study.

Very truly yours,



Peter J. Tennyson
965 Deer Trail
Fawnskin, CA 92333

695 Town Center Drive, 17th Floor
Costa Mesa, CA 92626-1924

United States Department of Agriculture
Forest Service
San Bernardino National Forest
Mountain Top Ranger District
P.O. Box 290
Fawnskin, CA 92333
909-866-3437 (Voice)
909-866-2867 (FAX)
909-866-3233 (TTY)

File Code: 2670

Date: March 22, 2002

Tracy Creason, Senior Associate Planner
Advance Planning Division
San Bernardino County Land Use Services Department
385 N. Arrowhead Ave., First Floor
San Bernardino, California 92415-0182

Re: Notice of Preparation of Environmental Impact Report (NOP), RCK Properties dated February 20, 2002, and Initial Study (IS) completed September 5, 2001.

Dear Ms. Creason:

We are in receipt of the above referenced NOP and IS regarding a development proposal in Bear Valley (Fawnskin), San Bernardino County, California. The property at issue is the approximately 62 acre parcel historically known as Moon Camp. The proposal, as noticed, involves a general plan/land use district amendment (rezoning) from RL-40 (rural living, 40 acre minimum lot size) to RS (residential, 7200 square feet minimum lot size). It also involves a 92-lot subdivision, Tentative Tract Map 16136. The proposed development also includes construction of a marina and realignment of State Route 38.

Some of these project components may require federal permits and trigger requirements for consultation under Section 7 of the federal Endangered Species Act. If so, we are willing to share documentation of recent consultations we have completed that address effects to listed species that may also be affected by the proposed development.

Please find attached our letter, dated August 1, 2001, submitted to your office in response to the Project Notice for this proposed development. The issues raised in this attached letter should be addressed in the Draft Environmental Impact Report.

In particular, the following issues should be fully analyzed, and alternatives developed as appropriate, to address the following:

1. Public access through the property and/or to the shore of Big Bear Lake.
2. Direct and Indirect effects to sensitive resources on adjacent San Bernardino National Forest lands
3. Full analysis of impacts to biological resources, including all special status species and habitats that may be affected.

We appreciate the opportunity to review this project notice, and all information in this letter is provided in the spirit of interagency coordination. We would be happy to share with the Planning Division any records and information we have regarding the plants,

wildlife, and habitats in the vicinity of this proposed project, and that of any other proposed project areas in Bear Valley.

We are also willing, upon request, to participate to the extent possible in the development and implementation of alternatives to this proposed development that would benefit the San Bernardino National Forest and the Public. With any questions or for additional information, please contact Scott Eliason, botanist at the Big Bear Ranger Station (909-866-3437 x3904).

Sincerely,

Allison Stewart

ALLISON STEWART
District Ranger

Attachment

Cc: Kate Kramer, California Department of Fish and Game
Jeff Newman, US Fish and Wildlife Service
Antal Szijj, Army Corps of Engineers

United States Department of Agriculture
Forest Service
San Bernardino National Forest
Mountain Top Ranger District
P.O. Box 290
Fawnskin, CA 92333
909-866-3437 (Voice)
909-866-2867 (FAX)
909-866-3233 (TTY)

File Code: 2670

Date: August 1, 2001

Mike Williams
San Bernardino County Land Use Services Department/Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, California 92415-0182

Re: PN: RCK Properties, File/Indx: GPA/TT/M331-8N/01/APN:0304-091-12*

Dear Mr. Williams:

We are in receipt of the above mentioned Project Notice regarding a development proposal in Bear Valley (Fawnskin), San Bernardino County, California. The property at issue is the 62.43 acre parcel historically known as Moon Camp. The proposal, as noticed, involves a general plan/land use district amendment (rezoning) from RL-40 (rural living, 40 acre minimum lot size) to RS (residential, 7200 square feet minimum lot size). It also involves a 92-lot subdivision of the 62.43 acre Moon Camp parcel. Although not specified in the Project Notice, the proposed development may also include construction of a marina and realignment of State Route 38; both of these project components would likely trigger federal nexus. As a point of correction, the property is east of Canyon Rd., not Oriole Lane, as indicated.

Development of Moon Camp as proposed would preclude future public access to an attractive stretch of lakeshore and forest. The San Bernardino National Forest has been in discussions to acquire this parcel over the past several years, and Moon Camp continues to be a SBNF acquisition goal. This open space has very high potential and desirability for public access, recreation, and interpretation.

Moon Camp provides an effective natural buffer for sensitive habitat areas on adjacent National Forest Lands to the north of the parcel. Pebble plain habitat supporting numerous threatened/endangered and sensitive species on adjacent National Forest has been protected and is recovering from previous road damage. These pebble plains are considered essential to the recovery of the federally listed pebble plain plant species, and Forest Service conservation of these habitat areas is required under the Endangered Species Act, as specified through recent consultation with Fish and Wildlife Service.

The proposed development, and resulting local population increase would be expected to have adverse effects on these adjacent sensitive Forest Service lands. Development of these 92 parcels would significantly affect our ability to protect the adjacent pebble plain habitat as directed under the Endangered Species Act. Increased presence and use would be expected to result in the formation of new roads and trails through this sensitive habitat area, and would be expected to cause increased levels of disturbance to wildlife

species including California spotted owls, flying squirrel, deer, quail, and many other species. We would consider all of these direct and indirect biological impacts to National Forest Lands to be significant, and potentially unmitigable.

Should this development proposal go forward, we would recommend that thorough biological resource analysis be performed, including analysis of impacts to adjacent National Forest Lands, protocol surveys for southwest willow flycatcher, bald eagle use analysis, and complete and accurate wildlife and botanical assessments. We would also request that all significant impacts to biological resources be fully mitigated in close coordination with the San Bernardino National Forest.

We appreciate the opportunity to review this project notice, and all information in this letter is provided in the spirit of interagency coordination. We would be happy to share with the Planning Division any records and information we have regarding the plants, wildlife, and habitats in the vicinity of this proposed project, and any other proposed project areas in Bear Valley. With any questions or for additional information, please contact Scott Eliason, botanist at the Big Bear Ranger Station (909-866-3437 x3904).

Sincerely,

/s/ *Allison Stewart*

ALLISON STEWART
District Ranger

Cc: Kate Kramer, California Department of Fish and Game
Jeff Newman, US Fish and Wildlife Service
Antal Szijj, Army Corps of Engineers
Mary Ann Rondinella, Federal Highways Administration
Kelly Cohen, California Department of Transportation

March 22, 2002

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MAR 2 6 2002

Advanced Planning Division
County of San Bernardino
385 N. Arrowhead Ave., Third Floor
San Bernardino, CA. 92415-0182
Attn; Tracy Creason

Reference; Environmental Impact Report for Moon Camp TT #16136

As a resident of Fawnskin, I am very concerned about the impact of the proposed new Moon Camp development in Fawnskin and wish to assure the EIR addresses the following issues:

1) Increased Road Traffic and Congestion
The 2-lane road running thru Fawnskin is very windy and cannot support additional traffic from a 90 home development. The air quality and increased noise must definitely be addressed in the EIR.

2) Water and Sewage-
Our well-derived water system is already taxed with the drought conditions in Big Bear and we are already paying an assessment thru CSA-53B for sewage. Construction of multiple homes would require new sewer systems and should be included in the study.

3) Wildlife and Trees-
The proposed development would require cutting over 700 trees and this would effect the protected Eagle habitat which also contains coyote and deer populations. Any EIR must show how these birds and animals will be lost by elimination of their nesting and denning sites.

Also, the quality of life here would be decreased as residents would have more noise, traffic and automobile pollution to contend with. I am very much against this development and I want the Impact Report to reflect these considerations.
Thank You.

Robert Hartunian
P.O. Box 25
Fawnskin, CA. 92333

TO: COUNTY OF SAN BERNARDINO
ADVANCE PLANNING DIVISION
385 N. ARROWHEAD AVE. THIRD FLOOR
SAN BERNARDINO, CA 92415-0182

RECEIVED
MAR 2 5 2002

ATTENTION: TRACY CREASON, SENIOR ASSOCIATE PLANNER

FROM: RON AND BETTY MOSLEY
P.O. BOX 475
1040 FAWNSKIN DR.
FAWNSKIN, CA 9233
909 866-5008

RE: ENVIORNMENTAL IMPACT REPORT FOR MOON CAMP TT #16136

WE ARE EXTREMELY CONCERNED WITHTHE LOSS OF EAGLE HABITAT. WHY IS IT SO IMPORTANT TO MAINTAIN THE HABITAT TODAY AND NOT TOMORROW. WE STILL HAVE AMPLE EAGLES FREQUENTING OUR AREA EACH WINTER TO MERIT THIS HABITAT. SO WHY IS IT NOT IMPORTANT TO PROVIDE THIS HABITAT ANY LONGER?

WE ARE CONCERNED WITH THE PART OF HIGHWAY 38 THAT IS INDICATED ON MAPS AS A SCENIC ROUTE, AND THE SCENIC ROUTE SIGNS WERE TAKEN DOWN THIS WINTER, IS THIS DUE TO THE PROPOSED DEVELOPMENTS THAT WE ARE ADDRESSING?

THE ISSUE OF WATER IS OF GREAT CONCERN TO ALL OF US. WE ARE MANDATED TO CONSERVE WATER DUE TO WATER SHORTAGE ... IF ALL THE PROPOSED DEVELOPMENTS INCLUDING THE NEW ZOO, BROOKSIDE ROAD DEVELOPMENT, CLUSTER PINES AND MOON CAMP DEVELOPMENTS TAKE PLACE WHERE WILL THE EXTRA WATER TO MEET THE NEEDS OF ALL COME FROM?

WILL THE PROPOSED PRIVATE MARINAS BE THE FIRST STEP TOWARDS PRIVATIZING BIG BEAR LAKE? LAKE ARROWHEAD IS PRIVATE, AND IT IS SHAMEFUL TO BE SHUTTING OUT THE GENERAL PUBLIC TO LAKE ACCESS.

THANK YOU FOR TAKING THE TIME TO ADDRESS OUR CONCERNS.

SINCERELY,

Ronald Mosley Betty E. Mosley

BETTY & RON MOSLEY

15.3 Traffic Data

KUNZMAN ASSOCIATES

TRANSPORTATION PLANNING - TRAFFIC ENGINEERING

1111 TOWN & COUNTRY ROAD, SUITE 34
ORANGE, CA 92868-4667
(714) 973-8383
FAX: (714) 973-8821
E-MAIL: MAIL @ TRAFFIC-ENGINEER.COM

September 30, 2003

Mathew W. Slowik
San Bernardino County Government Center
385 North Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415-0182

Dear Mr. Slowik:

We are pleased to present this traffic impact analysis of the proposed approximately 92 single family dwellings east of Fawnskin on the north side of State Route 38 in the Big Bear Lake Area.

This report summarizes our methodology, analysis, findings, and recommended mitigation measures. We trust that the findings, which are summarized in the front of the report and include the mitigation measures, will be of immediate as well as continuing value to you and the County of San Bernardino in evaluating the project's traffic impacts.

It has been a pleasure to serve your needs on this project. Should you have any questions, or if we can be of further assistance, please do not hesitate to call.

Sincerely,

KUNZMAN ASSOCIATES

William Kunzman

William Kunzman, P.E.
Registration Expiration
Date: 3-31-2004

#2425b

FAWNSKIN 92 DWELLINGS

TRAFFIC ANALYSIS

KUNZMAN ASSOCIATES
TRANSPORTATION PLANNING - TRAFFIC ENGINEERING

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Fawnskin 92 Dwellings

Traffic Analysis

This report contains the traffic impact analysis for the proposed approximately 92 single family dwellings east of Fawnskin and on the north side of State Route 38 in the vicinity of Big Bear Lake.

The traffic report contains documentation of existing traffic conditions, traffic generated by the project, distribution of the project traffic to roads outside the project, and an analysis of future traffic conditions. Each of these topics is contained in a separate section of the report. The first section is "Findings", and subsequent sections expand upon the findings. In this way, information on any particular aspect of the study can be easily located by the reader.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided in Appendix A.

1. Findings

This section summarizes the existing traffic conditions, project traffic impacts, and the proposed mitigation measures.

Existing Traffic Conditions

a. Table 1 shows the existing Intersection Delay Values and Level of Service (LOS).

b. For existing traffic conditions, the intersection of Stanfield Cutoff and North Shore operates at Level of Service A capacity based on delay. The intersection of Stanfield Cutoff and Big Bear Boulevard operates at Level of Service E based on Delay, which is unacceptable. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection. This may involve widening of the intersection and may involve the taking of right of way.

c. The project site is generally vacant at present, and does not generate traffic.

d. The proposed project will have access to State Route 38.

Traffic Impacts

e. Table 1 shows the existing plus project Intersection Delay values and Level of Service (LOS).

f. For existing plus project traffic conditions, the intersection of Stanfield Cutoff and North Shore operates at Level of Service B capacity based on delay. The intersection of Stanfield Cutoff and Big Bear Boulevard with the recommended mitigation measure operates at Level of Service D based on Delay, which is acceptable for a State Highway. Based on established threshold of significance criteria (Discussed in Section 2), the project has an insignificant traffic impact on Stanfield Cutoff and Big Bear Boulevard.

g. After project completion and in the year 2006, the intersection of Stanfield Cutoff and North Shore operates at Level of Service B capacity based on delay. The intersection of Stanfield Cutoff and Big Bear Boulevard with the recommended mitigation measure operates at Level of Service D based on Delay, which is acceptable for a State Highway. Based on established threshold of significance criteria (Discussed in Section 2), the project has an insignificant traffic impact on Stanfield Cutoff and Big Bear Boulevard.

h. Although the project does not have a significant impact on the intersection of Stanfield Cutoff and North Shore, this

intersection will require a traffic signal by 2025 because of background traffic growth.

i. Proposed land uses for the site is approximately 92 single family residential dwellings.

j. The project will generate 880 daily vehicle trips, 69 of which will occur during the morning peak hour, and 93 of which will occur during the evening peak hour.

k. Project-related traffic will not warrant the installation of a traffic signal at any location.

Mitigation Measures

The following measures are recommended to mitigate the impact of the existing, background growth, and project traffic:

l. Maintain a high level of service along North Shore by restricting parking.

m. A 150 foot eastbound left turn pocket should be striped for traffic on North Shore desiring to turn left into project access points. The County of San Bernardino recommends a continuous left turn lane, and Caltrans will make decision.

This is a Caltrans decision subject to agreement by the County of San Bernardino.

n. For future traffic conditions, the intersection of Stanfield Cutoff and North Shore will need a traffic signal. The project's pro rata share of the signal is $56,523.

o. For existing traffic conditions the intersection of Stanfield Cutoff and Big Bear Boulevard currently needs to have the eastbound right turn lane converted to an eastbound through lane through the intersection. The project's pro rata share of this off site road improvements is estimated to be $7,098. The eastbound right turn lane is restriped to an eastbound through lane, and involves roadway widening.

The eastbound right turn lane needs to be converted to a through lane, and this will require widening and may require additional right of way. The widening and additional right of way may be needed before or after the intersection, or both. And whether widening and a take of right of way is required at all depends on lane widths and taper lengths required by Caltrans.

The available right of way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of

typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino. The traffic study documents the need for the lane and the possible need for widening and right of way. Whether widening and right of way is needed is a function of the design criteria that Caltrans requires. This traffic study is not a design study, and this mitigation measure is not needed by this project. The project has no significant impact on this intersection, and the traffic study merely points out that it is needed to accommodate existing and future traffic volumes.

Any design that does not meet Caltrans minimum Design Standards will need an "Exception to Design Standard" fact sheet.

The estimated pro rata share opf the cost of the widening is $17,748.

p. Construct all streets internal to the project to full ultimate cross-sections as adjacent development occurs.

q. Construct all streets bordering the project to ultimate half-section widths in conjunction with development.

r. Landscape plantings and signs should be limited to 36 inches in height within 25 feet of project access points to assure good visibility.

s. Install a STOP sign on site egress roadways to North Shore.

Table 1a

SUMMARY OF INTERSECTION DELAY FOR THE UNSIGNALIZED INTERSECTION OF STANFIELD CUTOFF AND NORTH SHORE

Intersection	Land Use Scenario	Peak Hour	Lanes	Intersection Control	Two Way Stop Worst Level of Service (LOS)	
					Movement(s)	Level of Service
1. Stanfield Cutoff and North Shore - Average Month	Year 2001 Without Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore - Average Month	Year 2001 Without Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore - Average Month	Year 2001 With Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore - Average Month	Year 2001 With Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore - Peak Month	Year 2001 Without Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore - Peak Month	Year 2001 Without Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore - Peak Month	Year 2001 With Project	AM	Existing	2 Way Stop	NL, SL	B
1. Stanfield Cutoff and North Shore - Peak Month	Year 2001 With Project	PM	Existing	2 Way Stop	NL, SL	B
1. Stanfield Cutoff and North Shore - Average Month	Year 2006 Without Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore - Average Month	Year 2006 Without Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore - Average Month	Year 2006 With Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore - Average Month	Year 2006 With Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore - Peak Month	Year 2006 Without Project	AM	Existing	2 Way Stop	SL	B
1. Stanfield Cutoff and North Shore - Peak Month	Year 2006 Without Project	PM	Existing	2 Way Stop	SL	B
1. Stanfield Cutoff and North Shore - Peak Month	Year 2006 With Project	AM	Existing	2 Way Stop	NL, SL	B
1. Stanfield Cutoff and North Shore - Peak Month	Year 2006 With Project	PM	Existing	2 Way Stop	SL	B

Movement: NT = Northbound Through, NR = Northbound Right, NL = Northbound Left
ST = Southbound Through, SR = Southbound Right, SL = Southbound Left
ET = Eastbound Through, ER = Eastbound Right, EL = Eastbound Left
WT = Westbound Through, WR = Westbound Right, WL = Westbound Left

Table 1b

SUMMARY OF SIGNALIZED INTERSECTION DELAY AND LEVEL OF SERVICE (LOS)

Intersection	Land Use Scenario	Peak Hour	Lanes												Delay in Seconds and Level of Service (LOS)	Intersection Capacity Utilization (ICU) and LOS	Lanes
			Northbound			Southbound			Eastbound			Westbound					
			Thr	Rt	Lt	Thr	Rt	Lt	Thr	Rt	Lt	Thr	Rt	Lt			
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	35.2 D+	0.813 D+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	38.6 D+	0.913 E+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	36.5 D+	0.822 D+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	39.9 D+	0.918 E+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	28.3 C	0.643 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	26.8 C	0.669 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	29.2 C	0.654 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	27.5 C	0.675 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	49.3 D-	0.942 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	64.3 E	1.067 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	51.7 D-	0.951 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	66.1 E	1.072 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	31.7 C-	0.729 C+	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	30.2 C-	0.762 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	32.7 C-	0.741 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	31.0 C-	0.768 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	37.0 D+	0.839 D	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	42.0 D	0.943 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	38.4 D+	0.847 D	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	43.4 D	0.949 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	28.8 C	0.660 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	27.3 C	0.687 B-	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	29.9 C	0.671 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	28.1 C	0.693 B-	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	55.3 E+	0.975 E-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	73.6 E-	1.104 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	57.8 E+	0.987 E-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	75.5 E-	1.110 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	32.7 C-	0.752 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	31.1 C-	0.784 C-	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	33.8 C-	0.766 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	31.9 C-	0.790 C-	Widen

NOTES

The Level of Service (LOS) for the Delay Method and Intersection Capacity Utilization Method differ because they are calculated entirely differently and LOS is defined differently. See Appendices for further discussion.

Table 1b continued

SUMMARY OF SIGNALIZED INTERSECTION DELAY AND LEVEL OF SERVICE (LOS)

Intersection	Land Use Scenario	Peak Hour	Lanes												Delay in Seconds and Level of Service (LOS)	Intersection Capacity Utilization (ICU) and LOS	Lanes
			Northbound			Southbound			Eastbound			Westbound					
			Thr	Rt	Lt	Thr	Rt	Lt	Thr	Rt	Lt	Thr	Rt	Lt			
1. Stanfield Cutoff (NS) and North Shore (EW)	2025 Peak Month Without Project	AM	1	1	0	1	1	0	1	1	0	1	0	0	12.0 B+	0.456 A+	Existing
1. Stanfield Cutoff (NS) and North Shore (EW)	2025 Peak Month Without Project	PM	1	1	0	1	1	0	1	1	0	1	0	0	17.8 B-	0.359 A+	Existing
1. Stanfield Cutoff (NS) and North Shore (EW)	2025 Peak Month With Project	AM	1	1	0	1	1	0	1	1	0	1	0	0	12.2 B+	0.456 A+	Existing
1. Stanfield Cutoff (NS) and North Shore (EW)	2025 Peak Month With Project	PM	1	1	0	1	1	0	1	1	0	1	0	0	19.3 B-	0.359 A+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	48.4 D-	0.937 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	62.5 E+	1.060 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	50.8 D-	0.946 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	64.3 E	1.065 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	31.5 C-	0.726 C+	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	30.0 C	0.757 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	32.6 C-	0.737 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	30.7 C-	0.763 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	86.9 F+	1.110 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	119.0 F-	1.250 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	90.4 F	1.122 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	121.1 F-	1.255 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	37.9 D+	0.846 D	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	36.1 D+	0.872 D	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	39.4 D+	0.860 D	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	37.1 D+	0.877 D-	Widen

NOTES

The Level of Service (LOS) for the Delay Method and Intersection Capacity Utilization Method differ because they are calculated entirely differently and LOS is defined differently. See Appendices for further discussion.

2. Congestion Management Program (CMP) Methodology

This section discusses the County Congestion Management Program (CMP). The purpose, prescribed methodology, and definition of a significant traffic impact are discussed.

County Congestion Management Program (CMP)

The CMP is a result of Proposition 111 which was a statewide initiative approved by the voters in June, 1990. The proposition allowed for a nine cent per gallon state gasoline tax increase over a five year period.

Proposition 111 explicitly stated that the new gas tax revenues were to be used to fix existing traffic problems and was not to be used to promote future development. For a city to get its share of the Proposition 111 gas tax, it has to follow certain procedures specified by the State Legislature. The legislation requires that a Traffic Impact Analysis (TIA) be prepared for new development. The TIA is prepared to monitor and fix traffic problems caused by new development.

The Legislature requires that adjacent jurisdictions use a standard methodology for conducting a TIA. To assure that adjacent jurisdictions use a standard methodology in preparing TIA's, one common procedure is that all cities within a county, and the county agency itself, adopt and use one standard methodology for conducting TIA's.

Although each county has developed standards for preparing TIA's, TIA requirements do vary in detail from one county to another, but not in overall intent or concept. The general approach selected by each county for conducting TIA's has common elements.

The general approach for conducting a TIA is that existing weekday peak hour traffic is counted and the percent of roadway capacity currently used is determined. Then growth in traffic is accounted for and added to existing traffic and the percent of roadway capacity used is again determined. Then the project traffic is added and the percent of roadway capacity used is again determined. If the new project adds traffic to an overcrowded facility, then the new project has to mitigate the traffic impact so that the facility operates at a level which is no worse than before the project traffic was added.

If the project size is below a certain minimum threshold level, then a project does not have to have a TIA prepared, once it is shown or agreed that the project is below the minimum threshold.

In San Bernardino County a project needs a TIA if it generates more than 250 new peak hour trips. This project will generate 93 new peak hour trips (approximately). Although this project does not generate 250 new peak hour trips, nonetheless the County of San Bernardino has requested that the SanBag TIA requirements be met, with one exception. That exception is that engineering judgment can be used for determining the project's peak hour traffic distribution rather than determining the traffic distribution using the East Valley Traffic Model.

If a project is bigger than the minimum threshold size, then a TIA is required.

Prescribed Methodology for A Traffic Impact Analysis (TIA)

The TIA must include all monitored intersections to which the project adds traffic above a certain minimum amount.

In San Bernardino County, the monitored intersections are all arterial to arterial intersections.

In San Bernardino County, the CMP requires that all arterial links and their CMP intersections be included in the analysis when the anticipated project volume equals or exceeds 80 two-way trips in one peak hour. For freeways, it is 100 two-way trips in the peak hour. Based on this requirement and the distribution of project-generated trips, the project-generated arterial link volumes are less than 80 trips on all roadway links and their intersections.

In this case, the intersections of Stanfield Cutoff and North Shore Drive, and Stanfield Cutoff and Big Bear Boulevard are not CMP intersections.

If a project adds more traffic than the minimum threshold amount to an intersection, then that intersection has to be analyzed for deficiencies.

If the intersection has to be analyzed for deficiencies, then mitigation is required if the existing traffic plus anticipated traffic growth plus project traffic does cause the Intersection Delay to go above a certain point.

In San Bernardino County, mitigation is required if the intersection operates at worse than Level of Service C, ie Level of Service D, which corresponds to a maximum acceptable delay of 35 seconds for signalized intersections. The TIA guidelines require Level of Service E.

In San Bernardino County, impacted intersections are analyzed

using the Delay Methodology and the Intersection Capacity Utilization (ICU) Methodology. Although the Delay Method is required per TIA guidelines, the ICU Method is also used per TIA requirements to assure that there is no operational problems.

An intersection mitigation measure shall either fix the deficiency, or reduce both the delay and ICU so that they are below the level which occurs without the the project.

The following assumptions will be used:

Lane capacity:
1900 through
1900 right
1800 left
1700 double left
1600 triple left
2200 freeway lane

Lost time per phase: 2 seconds

Yellow time per phase: 3 seconds

Signal cycle length: 90 to 130 seconds and optimized to result in the lowest calculated delay

Random arrivals will be assumed for signal coordination, except where signal interconnection exists.

Minimum green plus yellow: 10 seconds

Peak hour factor: 0.95

Lane utilization factor: 1.00

Right turn lanes will be assumed if there is at least 10 feet of space for the right turns, whether striped or not

For freeways, a split of 55/45 percent will be assumed, and morning peak hour will be assumed to be 90 percent of evening peak hour, truck percentages will be per CalTrans, and a peak hour factor of 0.98 in congested areas and 0.95 for uncongested areas will be used.

Growth rates are calculated and applied on a simple growth rate basis rather than a compounded growth rate basis.

Project traffic is generated using rates and procedures contained in the Institute of Transportation Engineers, Trip

Generation manual. Project traffic distribution is provided by the reviewing agency or is agreed to in advance of the TIA being prepared. The TIA has to be prepared by a licensed Traffic Engineer.

This traffic analysis has been prepared in accordance with the TIA requirements except as noted. The TIA not only examined the CMP system of roads and intersections, but also other roads and intersections.

The project generated traffic was added to intersections, and a full intersection analysis was conducted, even when the project added traffic failed to meet the minimum thresholds that require an intersection analysis.

Mitigation Measures

If a project is large enough to require that a TIA be prepared, and if the project adds traffic to an intersection above a minimum threshold, and if the intersection is operating at above an acceptable level of operation, then the project must mitigate its traffic impact.

Traffic mitigation can be in many forms including adding lanes. Lanes can sometimes be obtained through restriping or elimination of parking, and sometimes require spot roadway widening.

3. Project Description

This section discusses the project's location, proposed development, and traffic characteristics of such a development. Figure 1 shows the project location. Figure 2 shows the project site plan.

Location

The project site is located east of Fawnskin on the north side of State Route 38 in the vicinity of Big Bear Lake. Access will be from North Shore.

Proposed Development

The project site is proposed to be developed with approximately 92 single family residential dwellings.

The following describes the proposed land uses from a traffic engineering viewpoint:

Single Family Detached Dwellings: The primary market for these units will be families with children. As a result, peak traffic volumes will occur during home-to-work and work-to-home trips. Child-related trips such as home-to-school or home-to-Little League are also a significant factor in the daily trip generation, but they have a smaller influence on peak hour volumes.

The project also includes 100 boat slips. The boat slips are to be used by residents who live there, and are not expected to generate additional external traffic.

In this traffic analysis it has been assumed that the homes are lived in year round by persons who commute to work. This is a maximum likely scenario. It is likely that so,me homes will be second homes and that those who do live there will tend to be retired more than typically found in Southern California.

Figure 1
Project Location

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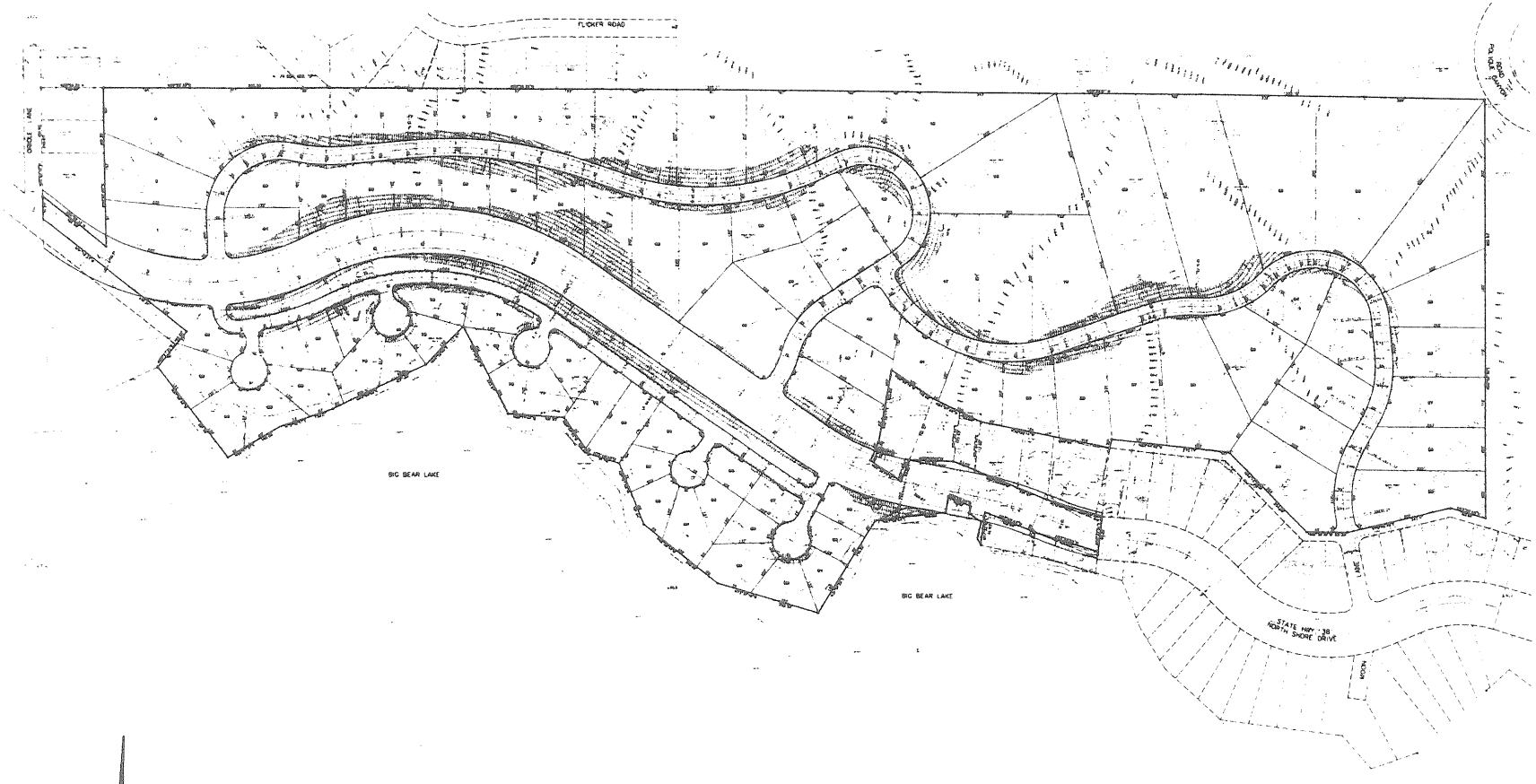
Figure 2
Site Plan



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4. Existing Traffic Conditions

The traffic conditions as they exist today are discussed below and illustrated in Figures 3 to 6.

Surrounding Street System

Because the roadway system is part of the State Highway System most people know the streets by their name rather than their State Highway number. Figure 3 was prepared to show the common name as well as State Highway number for each.

Roadways that will be utilized by the development include North Shore, Stanfield Cutoff and Big Bear Boulevard. In the vicinity of the project site, the following roadway conditions exist.

North Shore Drive:

This east-west two lane road is State Highway 38 and does not have left turn lanes at intersections. It currently has a peak month volume of 2,700 vehicle per day.

Stanfield Cutoff:

This north-south two lane road not have left turn lanes at intersections. It currently has a peak month volume of 6,000 vehicles per day.

Big Bear Boulevard:

This east-west road is four lanes west of Stanfield Cutoff and two lanes east of Stanfield Cutoff. It has a peak month volume of 21,100 vehicles per day west of Stanfield Cutoff.

Existing Travel Lanes and Intersection Controls

Figure 4 identifies the existing roadway conditions for highways near the site. The number of through lanes for existing roadways and the existing intersection controls are identified.

Existing Daily Traffic Volumes

Figures 5 and 6 depict the average and peak month daily two-way traffic volumes. Traffic volumes were obtained from the weekday peak hour intersection turning movement counts made by Kunzman Associates in March, 2001.

Table 3 shows daily traffic volumes as reported by CalTrans in Traffic Volumes for State Highways in 1989 and 1999. From this data it can be seen that a reasonable factor to convert typical month volumes to peak month volumes is 1.25.

The County of San Bernardino recommends a growth rate of 1.0 percent per year for the Big Bear area based on a recent analysis by the County. Typically an annual growth rate approach is better than a cumulative projects approach because the cumulative projects approach typically leads to double counted trips and everything gets worst cased so that there is a compounding of errors consideration also. The double counting occurs for instance when homes are proposed and the cumulative projects list includes a retail commercial center. The trip added from the home that goes to the store is the same trip added a second time from the store to the home. The compounding of errors leads to erroneous results when for instance in the case of residential the density is over estimated, then the trip generation is overestimated (this is particularly problematic in Big Bear where most houses are not inhabited full time, and then the trip distribution is overestimated in that the local trips are under reported and the longer trips are over reported. The County of Los Angeles uses the compounded growth rate approach. Also, it should be noted that the County of Riverside formerly used the compounded growth rate approach, then switched to the cumulative projects approach, and is now reconsidering going back to the compounded growth rate approach.

Year 2001 traffic volume estimates where not available from Caltrans "Traffic Volume, 2001" were obtained by factoring the sum of the morning and evening peak hour volumes. A factor of 5.5 was used. This method of estimating daily traffic volumes produces reasonable results. See Appendix B for more details.

Existing Peak Hour Turning Movement Volumes

Existing manual peak hour turning movement counts were made by Kunzman Associates in March, 2001.

Appendix C contains plots of the peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

There are two peak hours in a weekday. The morning peak hour is between 7 and 9 A.M., and the evening peak hour is between 4 and 6 P.M. The actual peak hour within the two hour interval is the four consecutive 15 minute periods with the highest total volume when all movements are added together. Thus, the evening peak hour at one intersection may be 4:45 to 5:45 P.M. if those four

consecutive 15 minute periods have the highest combined volume.

Existing Intersection Lanes

The Appendix C plots of peak hour turning movement volumes for each intersection also show the number of existing intersection through and turning movement lanes. The lanes are also listed in Table 1.

Existing Intersection Delay

The technique used to assess the operation of an intersection is known as the Intersection Delay Method. To calculate the Intersection Delay value the volume of traffic using the intersection is compared with the capacity of the intersection. The Intersection Delay value is usually expressed as the average seconds of delay per vehicle using the intersection.

The Intersection Delay for the existing traffic conditions have been calculated and are shown in Table 1.

Existing Intersection Delay values are based upon manual peak hour turning movement counts, factored up to represent peak month counts.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Existing Level of Service

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 2 shows how LOS is related to Intersection Delay, and describes LOS. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection. This will involve widening of the intersection and may involve the taking of right of way.

Table 2

LEVEL OF SERVICE DESCRIPTION FOR DELAY METHOD (1997 METHODOLOGY)

Level of Service	Description	Stopped Delay Per Vehicle (Seconds)
A	Level of Service A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 10.0
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	10.1 to 20.0
C	Level of Service generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.1 to 35.0
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.1 to 55.0
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.1 to 80.0
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.1 +

Source: HIGHWAY CAPACITY MANUAL, Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 1997, Pages 9-6 to 9-7.

Table 3

DETERMINING ANNUAL GROWTH RATES AND PEAK MONTH FACTORS

Road Location (See Figure 3 for Location References)	Year 1991			Year 2001			Growth Ratio	
	Annual Daily Traffic Volume	Peak Month Daily Traffic Volume	Peak Month Divided by Annual Daily Traffic Volume	Annual Daily Traffic Volume	Peak Month Daily Traffic Volume	Peak Month Divided by Annual Daily Traffic Volume	2001 Annual Volume Divided by 1991 Annual Volume	Annual Growth Rate (Percent)
1. Rim of the World Highway (SR18) west of Northshore Drive (SR38)	5,200	6,000	1.15	6,100	7,100	1.16	1.173	1.73%
2. Big Bear Boulevard (SR18) East of North Shore Drive (SR38)	6,900	8,000	1.16	6,300	7,300	1.16	0.913	-0.87%
3. Big Bear Boulevard (SR18) West of Stanfield Cutoff	16,000	19,100	1.19	18,000	20,500	1.14	1.125	1.25%
4. Big Bear Boulevard (SR18) East of Stanfield Cutoff	13,000	15,300	1.18	16,000	18,100	1.13	1.231	2.31%
5. North Shore Drive (SR38) North of Big Bear Boulevard (SR18) and Dam	2,000	2,350	1.18	1,600	2,300	1.44	0.800	-2.00%
6. North Shore Drive (SR38) West of Stanfield Cutoff	3,000	3,450	1.15	3,400	4,750	1.40	1.133	1.33%
7. North Shore Drive (SR38) East of Stanfield Cutoff	3,300	3,750	1.14	5,000	6,900	1.38	1.515	5.15%
Average			1.16			1.26		
Value Which Will Be Used for Traffic Study			1.25			1.25		

NOTE: SR = State Route

The peak month conditions are for a typical day in a peak month and do not necessarily include peak weekend conditions such as the Fourth of July.

Figure 3
State Highway Designations

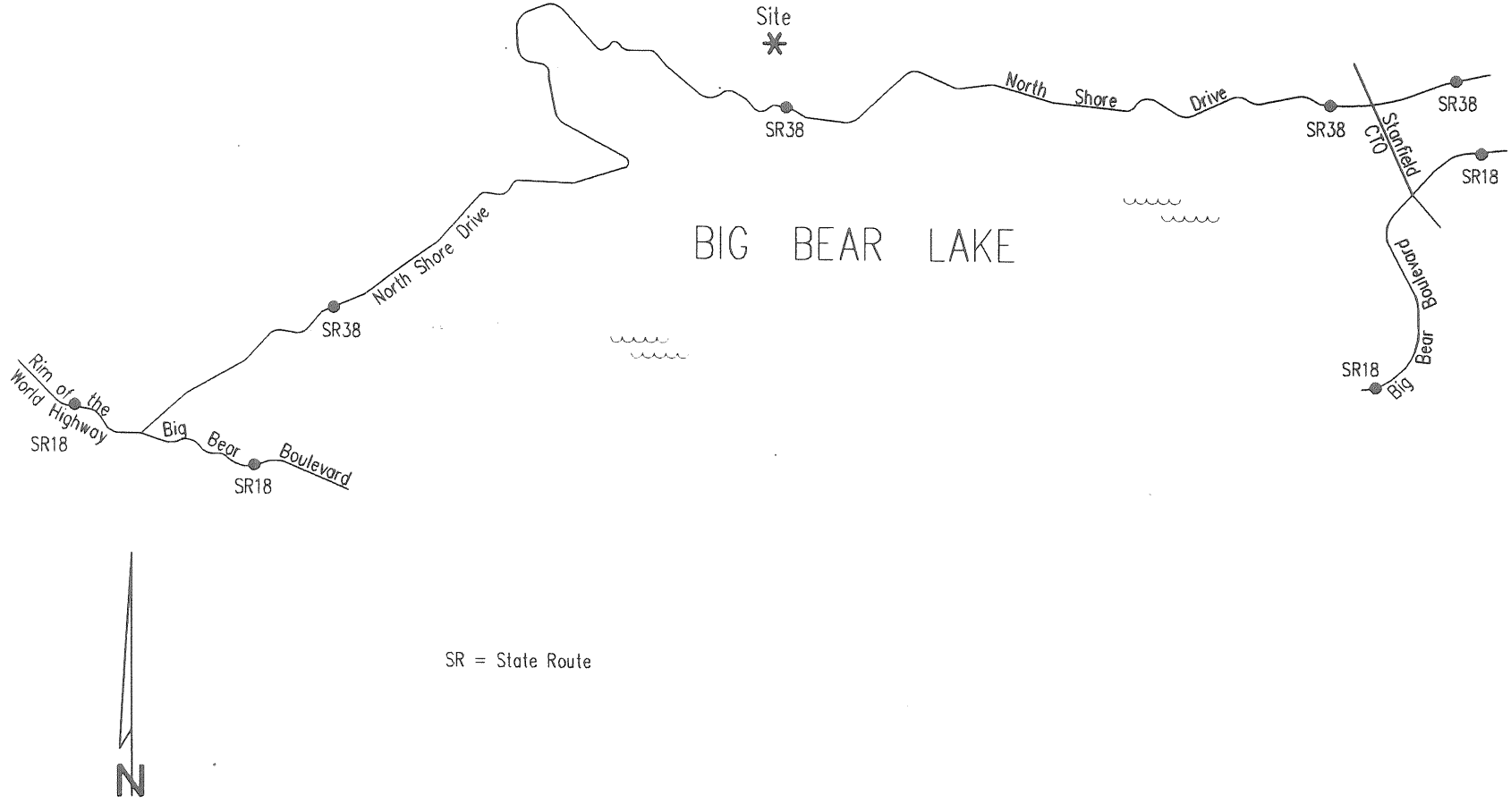

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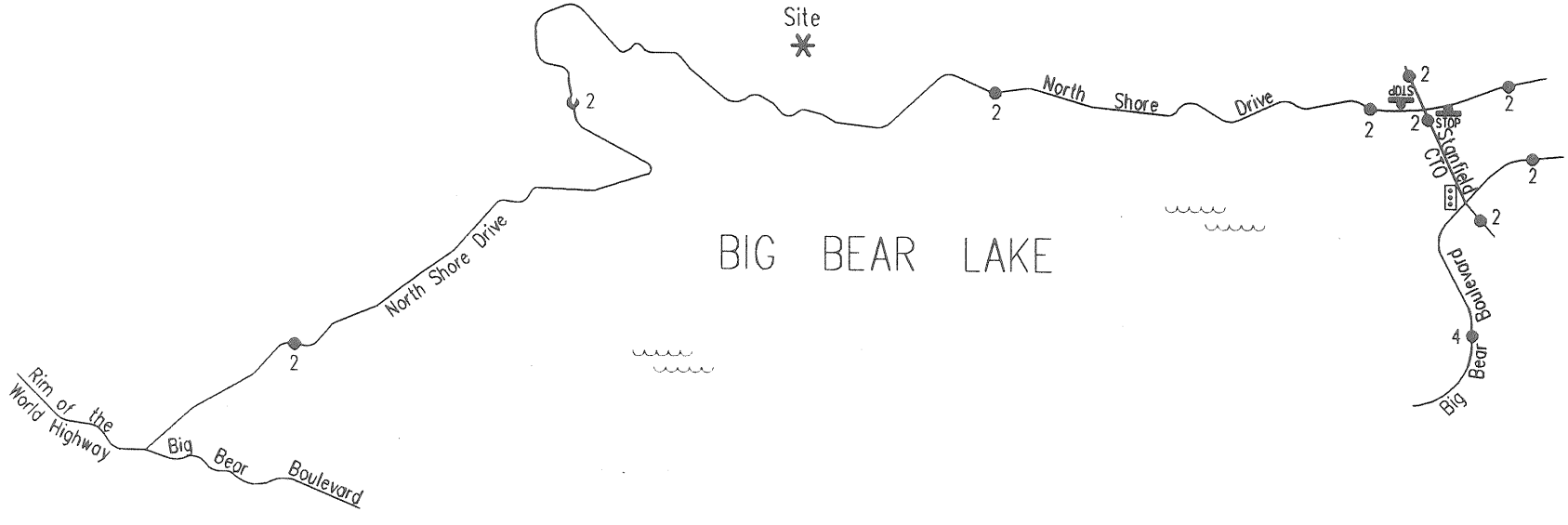
Figure 4
Existing Through Travel Lanes and Intersection Control



Legend

- 2 – Through Travel Lane
- STOP – STOP Sign
- Signal

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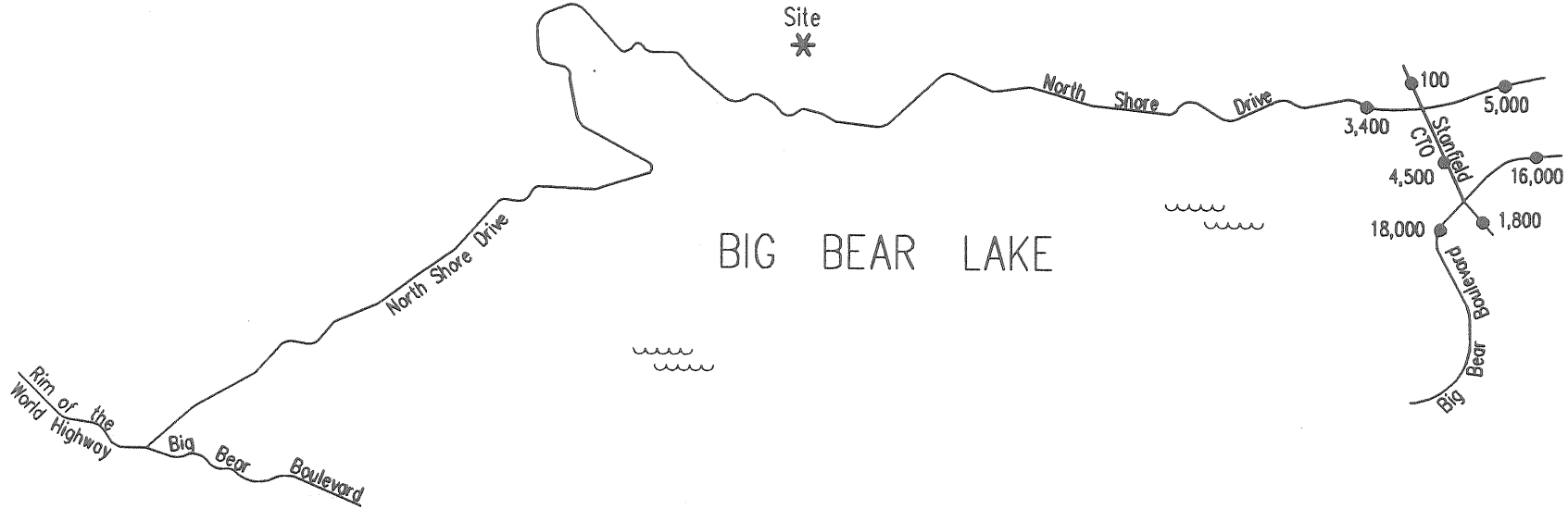
Figure 5
Existing Daily Traffic Volumes – Average Month



Source: Caltrans 2001 "Traffic Volumes" on Highways 18 and 38, and estimated for Stanfield Cutoff

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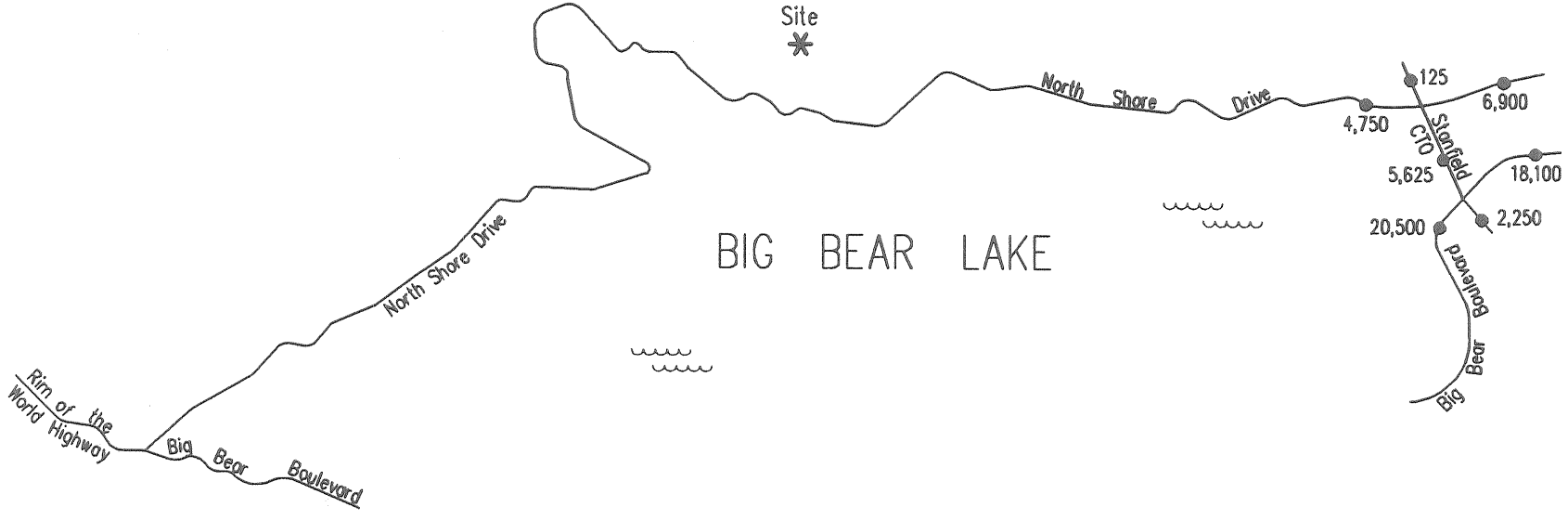
Figure 6
Existing Daily Traffic Volumes – Peak Month*



Source: Caltrans 2001 "Traffic Volumes" for Highways 18 and 38, and Stanfield volume was assumed to be 25 percent higher than the average month.

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5. Project Traffic

To estimate project-related traffic volumes at various points on the street network, a three step process is utilized. First, the traffic that will be generated by the proposed development is determined. Second, the traffic volumes are geographically distributed to major attractions of trips, such as employment centers, commercial centers, recreational areas or residential areas. Finally, the trips are assigned to specific roadways and the project-related traffic volumes are determined on a route-by-route basis.

Traffic Generation

The traffic generated by the project is determined by multiplying an appropriate trip generation rate by the quantity of land use. Trip generation rates are expressed in terms of trip ends per person, trip ends per employee, trip ends per acre, trip ends per dwelling, or trip ends per thousand square feet of floor space. For instance, if a particular land use generates six outbound trips per acre in the morning peak hour, then six vehicles are expected to leave the site in the morning peak hour for each acre of development.

Significant research efforts have been made by the Institute of Transportation Engineers and others to establish the correlation between trips and land use. From this body of information, trip generation rates can be estimated with reasonable accuracy for various land uses.

Trip generation rates are predicated on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and our life styles remain similar to what we know today. A major change in these variables may affect trip generation rates.

Trip generation rates were determined for daily traffic, morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land uses. The trip generation rates are from Trip Generation, Sixth Edition, Institute of Transportation Engineers, 1997.

By multiplying the traffic generation rates by the land use quantities, the traffic volumes are determined. Table 4 exhibits the traffic generation rates and exhibits the peak hour and daily traffic volumes.

The project also includes 100 boat slips. The boat slips are to be used by residents who live there, and are not expected to

generate additional external traffic.

In this traffic analysis it has been assumed that the homes are lived in year round by persons who commute to work. This is a maximum likely scenario. It is likely that so,me homes will be second homes and that those who do live there will tend to be retired more than typically found in Southern California.

Traffic Distribution and Assignment

Traffic distribution is the determination of the directional orientation of traffic. It is based on the geographical location of employment centers, commercial centers, recreational areas, or residential area concentrations.

Traffic assignment is the determination of which specific route development traffic will use, once the generalized traffic distribution is determined. The basic factors affecting route selection are minimum time path and minimum distance path.

Figure 7 contains the directional distribution and assignment of the project traffic for the proposed land uses.

The County of San Bernardino requested that the following intersections be analyzed:

1. Stanfield Cutoff and North Shore Drive
2. Stanfield Cutoff and Big Bear Boulevard

Project-Related Traffic

Based on the identified traffic generation and distributions, project related daily traffic volumes are shown in Figure 8.

Table 4

PROJECT TRAFFIC GENERATION

Descriptor	Trip Generatio Rate	Trips Generated by 92 Dwellings
Units	Dwellings	Dwellings
Daily	9.57	880
Morning Peak Hour - In	0.19	17
Morning Peak Hour - Out	0.56	52
Total	0.75	69
Evening Peak Hour - In	0.65	60
Evening Peak Hour - Out	0.36	33
Total	1.01	93

SOURCE: Trip Generation, 6th Edition, Institute of Transportation Engineers, 1997, Category 210.

Figure 7
Project Traffic Distribution (Weekday Peak Hours)

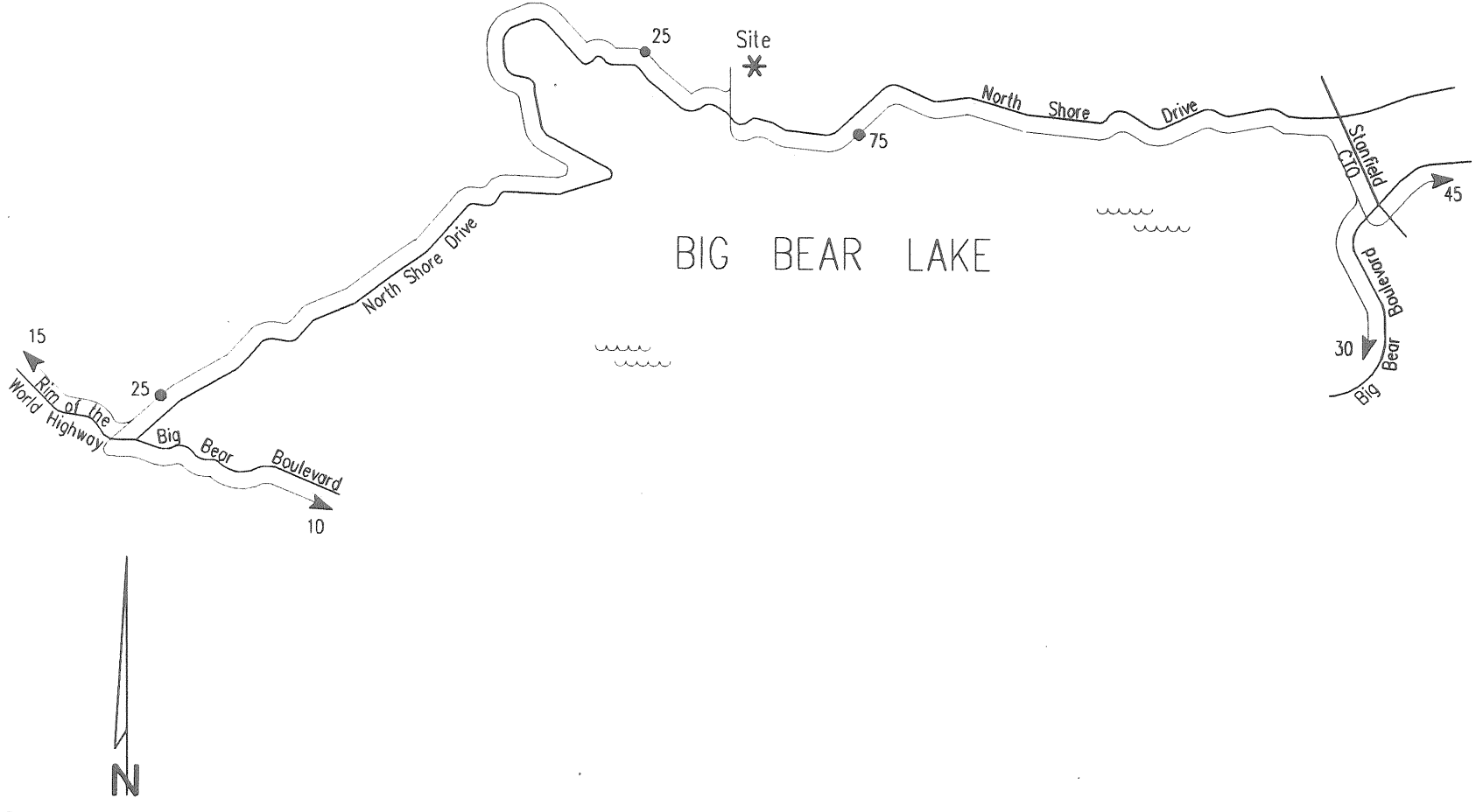

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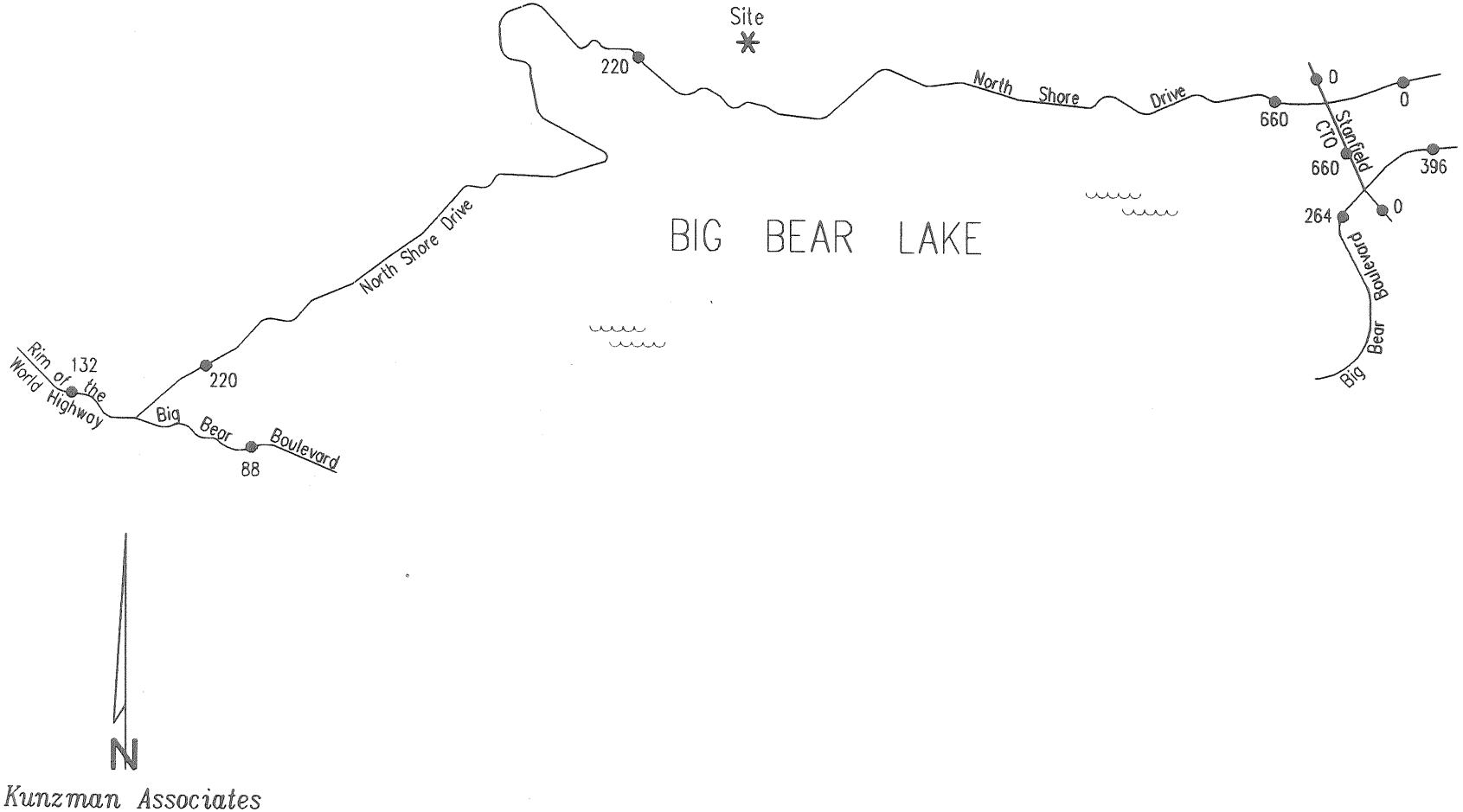
Figure 8
Project Generated Daily Traffic Volumes



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6. Existing Plus Project Traffic Conditions

Once the project-related traffic is assigned to the existing street network and added to existing volumes, the traffic impact can be assessed. Figure 9 illustrates the existing plus project traffic conditions for the peak month.

Existing Plus Project Daily Traffic Volumes

Upon project completion and occupancy the expected daily two-way traffic volumes are as illustrated in Figure 9. Figure 9 shows expected peak month daily traffic volumes for existing plus project traffic conditions.

Existing Plus Project Peak Hour Turning Movement Volumes

Appendix C contains plots of the existing plus project peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Existing Plus Project Intersection Lanes

The Appendix C plots of peak hour turning movement volumes for each intersection also show the number of existing plus project intersection through and turning movement lanes. The lanes are also listed in Table 1.

Existing Plus Project Intersection Delay

The Intersection Delay for the existing plus project traffic conditions have been calculated and are shown in Table 1.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Existing Plus Project Level of Service

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 1, it can be seen that all intersections in the vicinity of the site operate at a LOS D or better for existing plus project peak hour traffic conditions, based on Delay. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection. The project does not have a significant impact on this intersection based on the thresholds of significance described in Section 2. It therefore is not required to mitigate this deficiency.

The eastbound right turn lane needs to be converted to a through lane, and that this will require widening and may require additional right of way. The widening and additional right of way may be needed before or after the intersection, or both. And whether widening and a take of right of way is required at all depends on lane widths and taper lengths required by Caltrans.

The available right of way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino. The traffic study documents the need for the lane and the possible need for widening and right of way. Whether widening and right of way is needed is a function of the design criteria that Caltrans requires. This traffic study is not a design study, and this mitigation measure is not needed by this project. The project has no significant impact on this intersection, and the traffic study merely points out that it is needed to accommodate existing and future traffic volumes.

Any design that does not meet Caltrans minimum Design Standards will need an "Exception to Design Standard" fact sheet.

Traffic Signal Warrants

Traffic signals will not be warranted at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. Rural Warrants are applicable for roadways with speeds over 40 miles per hour.

Traffic signal warrants have been adopted by the Federal Highway Administration and CalTrans. These warrants are based upon the eight highest hour volumes in a day. It is assumed by CalTrans that the eighth highest hour is 62.5 percent of the peak hour, and the peak hour is generally 10 percent of the daily traffic.

Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5 shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

Table 5

TRAFFIC SIGNAL WARRANTS

(Based on Estimated Average Daily Traffic - See Note 2)

Signal Warrant URBAN ..... RURAL.....XXXXX..... Use RURAL if critical speed equals or exceeds 40 MPH	Minimum Requirements Estimated Average Daily Traffic (EADT)	
1. Minimum Vehicular Satisfied YES (2025) Not Satisfied _____	Vehicles per day on major street (total of both approaches)	Vehicles per day on higher-volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach		
Major Street / Minor Street	Urban / Rural	Urban / Rural
1 ..... 1	8,000 / 5,600<<<<	2,400 / 1,680<<<<
2 or more 1	9,600 / 6,720	2,400 / 1,680
2 or more ..... 2 or more	9,600 / 6,720	3,200 / 2,240
1 ..... 2 or more	8,000 / 5,600	3,200 / 2,240
2. Interruption of Continuous Traffic Satisfied _____ Not Satisfied _____	Vehicles per day on major street (total of both approaches)	Vehicles per day on higher-volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach		
Major Street / Minor Street	Urban / Rural	Urban / Rural
1 ..... 1	12,000 / 8,400<<<<	1,200 / 850<<<<
2 or more 1	14,400 / 10,080	1,200 / 850
2 or more ..... 2 or more	14,400 / 10,080	1,600 / 1,120
1 ..... 2 or more	12,000 / 8,400	1,600 / 1,120
3. Combination Satisfied _____ Not Satisfied _____ No one warrant satisfied but following warrants fulfilled 80% or more ..... _____ 1 _____ 2	2 Warrants	2 Warrants

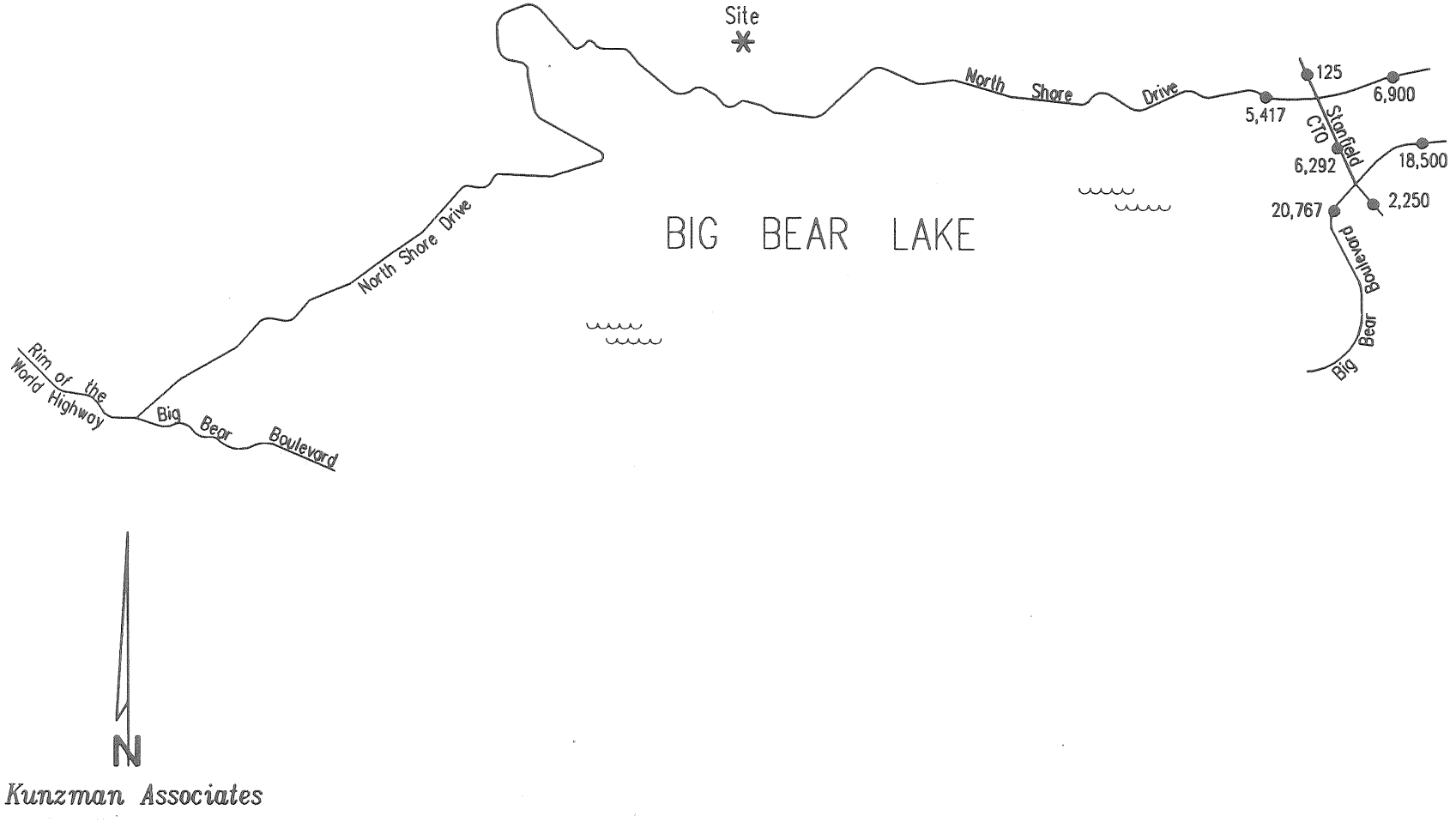
NOTE:

1. Heavier left turn movement from the major street may be included with minor street volume if a separate signal phase is to be provided for the left-turn movement.
2. To be used only for NEW INTERSECTIONS or other locations where actual traffic volumes cannot be counted.

Source: CalTrans, TRAFFIC MANUAL, page 9-8

<<<< These are the warrant volumes that apply to Stanfield Cutoff and North Shore Drive

Figure 9
Existing Plus Project Daily Traffic Volumes – Peak Month



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7. Existing Plus Other Development Traffic Conditions - Year 2006

After background traffic growth has been added to existing volumes, the traffic impact can be assessed. Figure 10 illustrates the existing plus other development traffic conditions for an average month and Figure 11 for a peak month. The time frame of projection is Year 2006.

Other Development Growth - Year 2006

To account for growth which can be expected in the area, a growth rate of 1 percent per year compounded annually for 5 years has been assumed. The total compounded growth over 5 years is 5 percent. The basis of this growth rate assumption is the County of San Bernardino.

Existing Plus Other Development Daily Traffic Volumes - Year 2006

For existing plus other development traffic conditions the expected daily two-way traffic volumes are as illustrated in Figure 10. See Table 6 for the calculation of intersection leg daily traffic volumes.

Existing Plus Other Development Peak Hour Turning Movement Volumes - Year 2006

Appendix C contains plots of the existing plus other development peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Existing Plus Other Development Intersection Lanes - Year 2006

The Appendix C plots of peak hour turning movement volumes for each intersection also show the number of existing plus other development intersection through and turning movement lanes. The lanes are also listed in Table 1.

Existing Plus Other Development Intersection Delay - Year 2006

The Intersection Delay for the existing plus other development traffic conditions have been calculated and are shown in Table 1.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Existing Plus Other Development Level of Service - Year 2006

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 1, it can be seen that all intersections in the vicinity of the site operate at a LOS E or better for existing plus other development peak hour traffic conditions based on delay. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection.

The eastbound right turn lane needs to be converted to a through lane, and that this will require widening and may require additional right of way. The widening and additional right of way may be needed before or after the intersection, or both. And whether widening and a take of right of way is required at all depends on lane widths and taper lengths required by Caltrans.

The available right of way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino. The traffic study documents the need for the lane and the possible need for widening and right of way. Whether widening and right of way is needed is a function of the design criteria that Caltrans requires. This traffic study is not a design study, and this mitigation measure is not needed by this project. The project has no significant impact on this intersection, and the traffic study merely points out that it is needed to accommodate existing and future traffic volumes.

Any design that does not meet Caltrans minimum Design Standards

will need an "Exception to Design Standard" fact sheet.

Traffic Signal Warrants - Year 2006

Traffic signals will not be warranted at the intersections of Stanfield Cutoff and North Shore Drive based on Rural Warrants. The applicability of Rural Warrants was previously discussed.

Traffic signal warrants have been adopted by the Federal Highway Administration and CalTrans. These warrants are based upon the eight highest hour volumes in a day. It is assumed by CalTrans that the eighth highest hour is 62.5 percent of the peak hour, and the peak hour is generally 10 percent of the daily traffic. Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5 shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

It should be noted that signals should be installed only when warranted and that installation of unwarranted signals can increase accident potential, energy consumption, and air pollutant emissions, while costing governmental jurisdictions approximately $500 per month for maintenance and utilities.

Table 6

DAILY LEG VOLUME CALCULATIONS

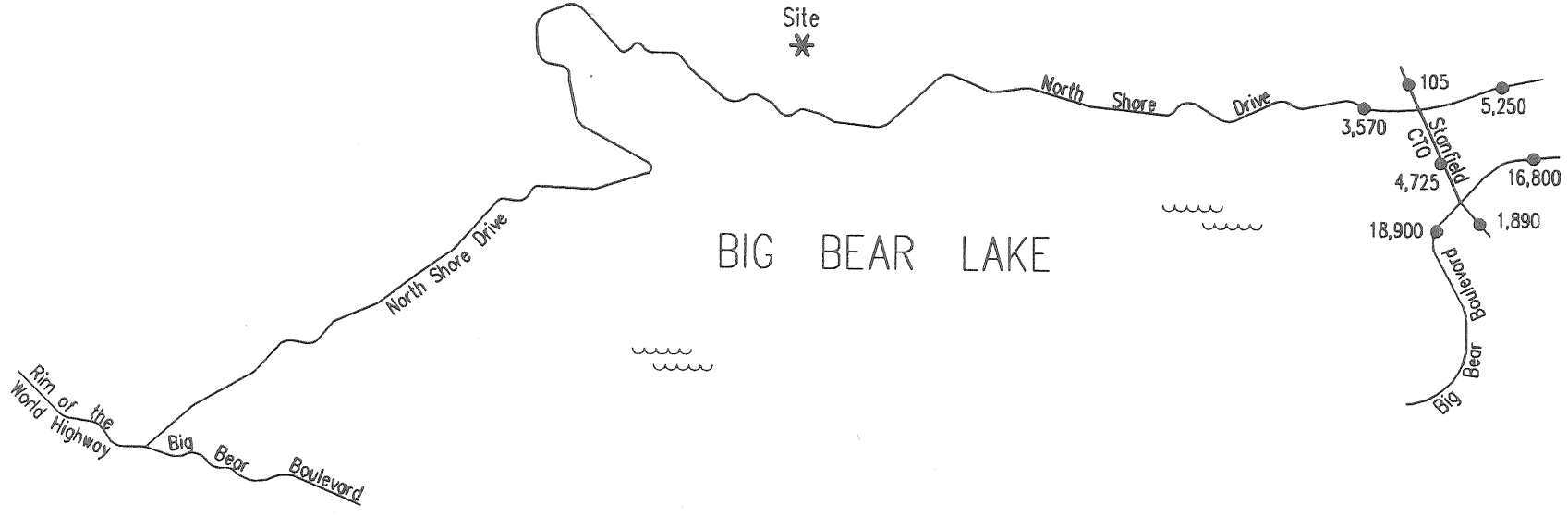
Intersection	Inter-section Leg	Project Added Daily Leg Volume	Existing Year 2001		Year 2006		Year 2025	
			Existing Daily Volumes	With Project Volumes	Existing Plus Background Growth Daily Volumes	With Project Volumes	Existing Plus Background Growth Daily Volumes	With Project Volumes
1. Stanfield Cutoff (NS) and North Shore Drive (EW)	North	0	100	100	105	105	124	124
	South	667	4,500	5,167	4,725	5,392	5,580	6,247
	East	0	4,500	4,500	4,725	4,725	5,580	5,580
Average Month	West	667	2,100	2,767	2,205	2,872	2,604	3,271
2. Stanfield Cutoff (NS) and Big Bear Boulevard (EW)	North	667	4,500	5,167	4,725	5,392	5,580	6,247
	South	0	1,800	1,800	1,890	1,890	2,232	2,232
	East	400	13,800	14,200	14,490	14,890	17,112	17,512
Average Month	West	267	16,900	17,167	17,745	18,012	20,956	21,223
1. Stanfield Cutoff (NS) and North Shore Drive (EW)	North	0	125	125	131	131	155	155
	South	667	6,000	6,667	6,300	6,967	7,440	8,107
	East	0	6,000	6,000	6,300	6,300	7,440	7,440
Peak Month	West	667	2,700	3,367	2,835	3,502	3,348	4,015
2. Stanfield Cutoff (NS) and Big Bear Boulevard (EW)	North	667	6,000	6,667	6,300	6,967	7,440	8,107
	South	0	2,200	2,200	2,310	2,310	2,728	2,728
	East	400	17,300	17,700	18,165	18,565	21,452	21,852
Peak Morth	West	267	21,100	21,367	22,155	22,422	26,164	26,431

NOTE: Background Growth Rate is assumed to be as follows in percent: 1.000

From Year 2001 to Year 2006 is 5 years. The calculated simple growth factor is: 1.050

From Year 2001 to Year 2025 is 24 years. The calculated simple growth factor is: 1.240

Figure 10
2006* Daily Traffic Volumes – Average Month



* Year 2006 volumes are assumed to be 5 percent higher than Year 2001 volumes

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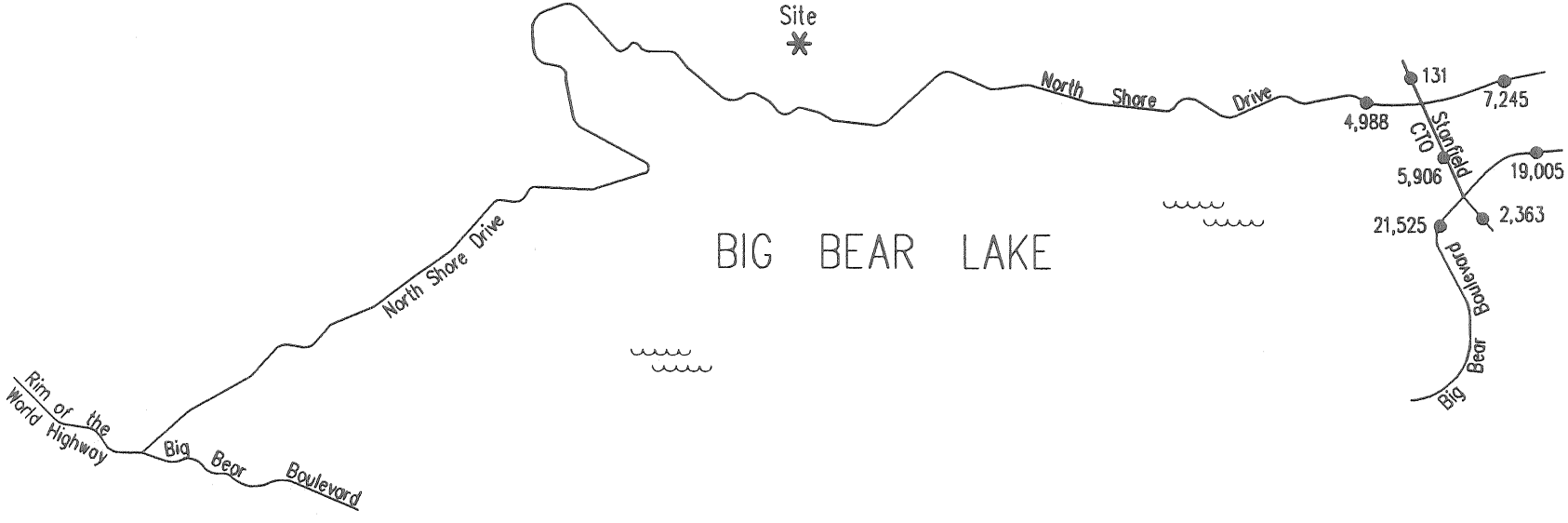
Figure 11
Year 2006 Daily Traffic Volumes – Peak Month*



* Peak month volumes are assumed to be 25 percent higher than average month

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8. Existing + Project + Other Development Traffic Conditions - Year 2006

Substantial additional development is presently planned in the vicinity of the site. To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. Figure 12 illustrates traffic conditions including other planned development with the project.

Other Development Growth - Year 2006

To account for growth which can be expected in the area, a growth rate of 1 percent per year compounded annually for 5 years has been assumed. The total compounded growth over 5 years is 5 percent. The basis of this growth rate assumption is the County of San Bernardino.

Cumulative Conditions Daily Traffic Volumes - Year 2006

Figure 12 displays the cumulative traffic volumes that exist in the peak month when the project traffic volumes and other future development traffic volumes are added to existing traffic volumes. See Table 6 for the calculation of intersection leg daily traffic volumes.

Cumulative Conditions Peak Hour Turning Movement Volumes - Year 2006

Appendix C contains plots of the cumulative conditions peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Cumulative Conditions Intersection Lanes - Year 2006

The Appendix C plots of peak hour turning movement volumes for each intersection also show the number of cumulative conditions intersection through and turning movement lanes. The lanes are also listed in Table 1.

Cumulative Conditions Intersection Delay - Year 2006

The Intersection Delay for the cumulative traffic conditions have been calculated and are shown in Table 1.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Cumulative Conditions Level of Service - Year 2006

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 1, it can be seen that all intersections in the vicinity of the site operate at a LOS F or better for cumulative peak hour traffic conditions based on delay. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection. The project does not have a significant impact on this intersection based on the thresholds of significance described in Section 2. It therefore is not required to mitigate this deficiency.

The eastbound right turn lane needs to be converted to a through lane, and that this will require widening and may require additional right of way. The widening and additional right of way may be needed before or after the intersection, or both. And whether widening and a take of right of way is required at all depends on lane widths and taper lengths required by Caltrans.

The available right of way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino. The traffic study documents the need for the lane and the possible need for widening and right of way. Whether widening and right of way is needed is a function of the design criteria that Caltrans requires. This traffic study is not a design study, and this mitigation measure is not needed by this project. The project has no significant impact on this intersection, and the traffic study merely points out that it is needed to accommodate existing and future traffic volumes.

Traffic Signal Warrants - Year 2006

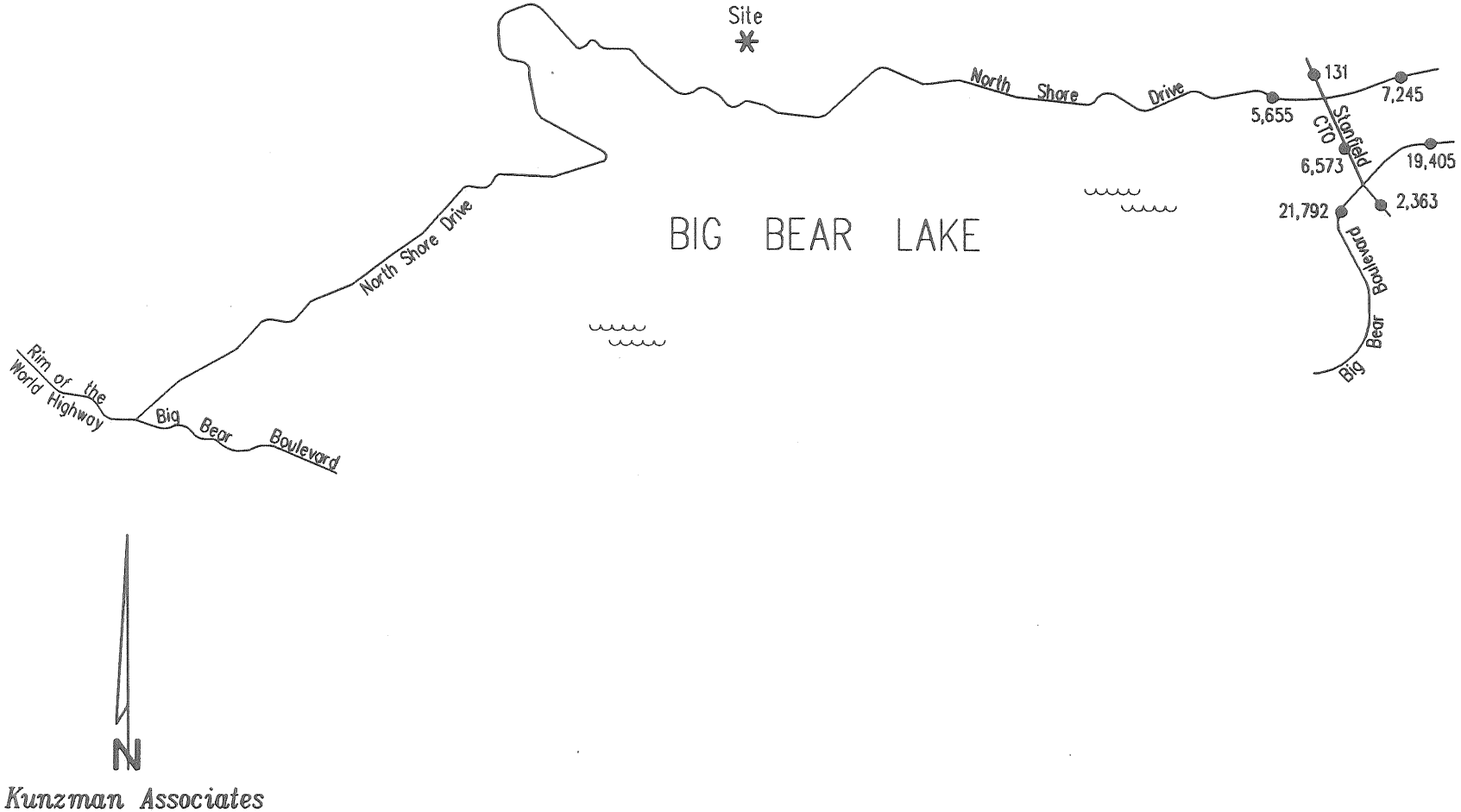
Traffic signals will not be be warranted at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. The applicability of Rural Warrants was previously discussed.

Traffic signal warrants have been adopted by the Federal Highway Administration and CalTrans. These warrants are based upon the eight highest hour volumes in a day. It is assumed by CalTrans that the eighth highest hour is 62.5 percent of the peak hour, and the peak hour is generally 10 percent of the daily traffic. Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5 shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

It should be noted that signals should be installed only when warranted and that installation of unwarranted signals can increase accident potential, energy consumption, and air pollutant emissions, while costing governmental jurisdictions approximately $500 per month for maintenance and utilities.

Figure 12
Year 2006 Plus Project Daily Traffic Volumes – Peak Month



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9. Existing Plus Other Development Traffic Conditions - Year 2025

After background traffic growth has been added to existing volumes, the traffic impact can be assessed. Figure 13 illustrates the existing plus other development traffic conditions for an average month and Figure 14 for a peak month. The time frame of projection is Year 2025.

Other Development Growth - Year 2025

To account for growth which can be expected in the area, a growth rate of 1 percent per year compounded annually for 24 years has been assumed. The total compounded growth over 24 years is 24 percent. The basis of this growth rate assumption is the County of San Bernardino.

Existing Plus Other Development Daily Traffic Volumes - Year 2025

For existing plus other development traffic conditions the expected daily two-way traffic volumes are as illustrated in Figure 13. See Table 6 for the calculation of intersection leg daily traffic volumes.

Existing Plus Other Development Peak Hour Turning Movement Volumes - Year 2025

Appendix C contains plots of the existing plus other development peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Existing Plus Other Development Intersection Lanes - Year 2025

The Appendix C plots of peak hour turning movement volumes for each intersection also show the number of existing plus other development intersection through and turning movement lanes. The lanes are also listed in Table 1.

Existing Plus Other Development Intersection Delay - Year 2025

The Intersection Delay for the existing plus other development traffic conditions have been calculated and are shown in Table 1.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Existing Plus Other Development Level of Service - Year 2025

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 1, it can be seen that all intersections in the vicinity of the site operate at a LOS E or better for existing plus other development peak hour traffic conditions based on delay. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection.

The eastbound right turn lane needs to be converted to a through lane, and that this will require widening and may require additional right of way. The widening and additional right of way may be needed before or after the intersection, or both. And whether widening and a take of right of way is required at all depends on lane widths and taper lengths required by Caltrans.

The available right of way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino. The traffic study documents the need for the lane and the possible need for widening and right of way. Whether widening and right of way is needed is a function of the design criteria that Caltrans requires. This traffic study is not a design study, and this mitigation measure is not needed by this project. The project has no significant impact on this intersection, and the traffic study merely points out that it is needed to accommodate existing and future traffic volumes.

Any design that does not meet Caltrans minimum Design Standards will need an "Exception to Design Standard" fact sheet.

Traffic Signal Warrants - Year 2025

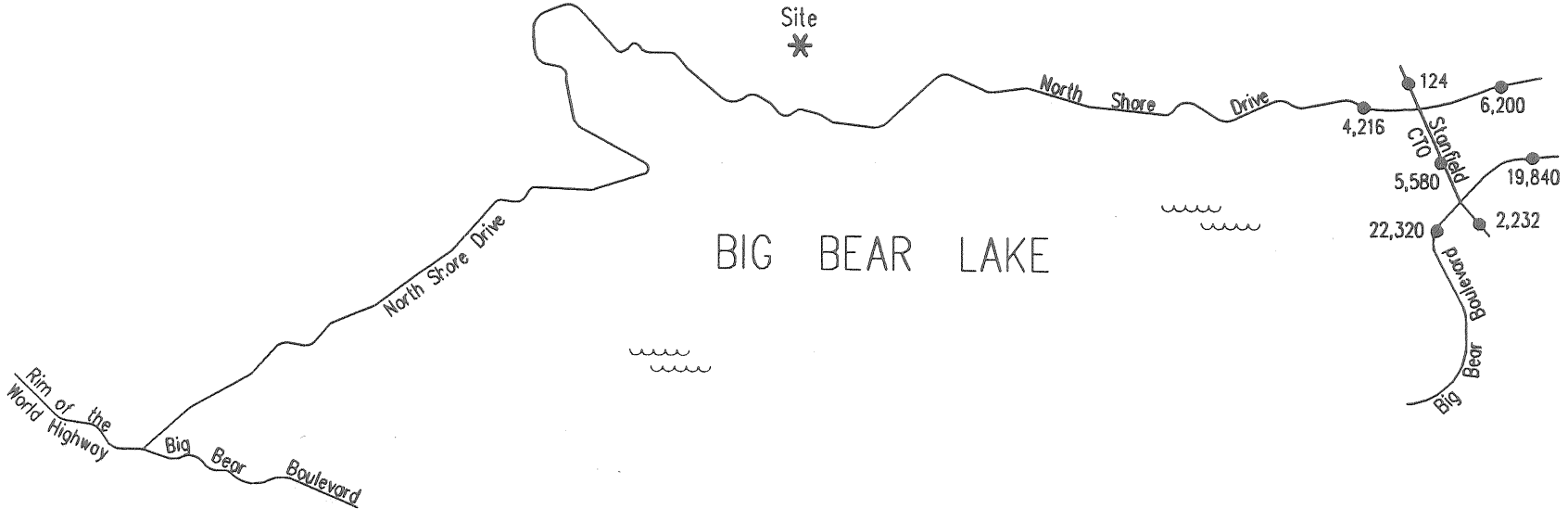
Traffic signals will be warranted at the intersections of Stanfield Cutoff and North Shore Drive based on Rural Warrants. The applicability of Rural Warrants was previously discussed.

Traffic signal warrants have been adopted by the Federal Highway Administration and CalTrans. These warrants are based upon the eight highest hour volumes in a day. It is assumed by CalTrans that the eighth highest hour is 62.5 percent of the peak hour, and the peak hour is generally 10 percent of the daily traffic. Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5 shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

It should be noted that signals should be installed only when warranted and that installation of unwarranted signals can increase accident potential, energy consumption, and air pollutant emissions, while costing governmental jurisdictions approximately $500 per month for maintenance and utilities.

Figure 13
2025* Daily Traffic Volumes – Average Month



* Year 2025 volumes are assumed to be 24 percent higher than Year 2001 volumes

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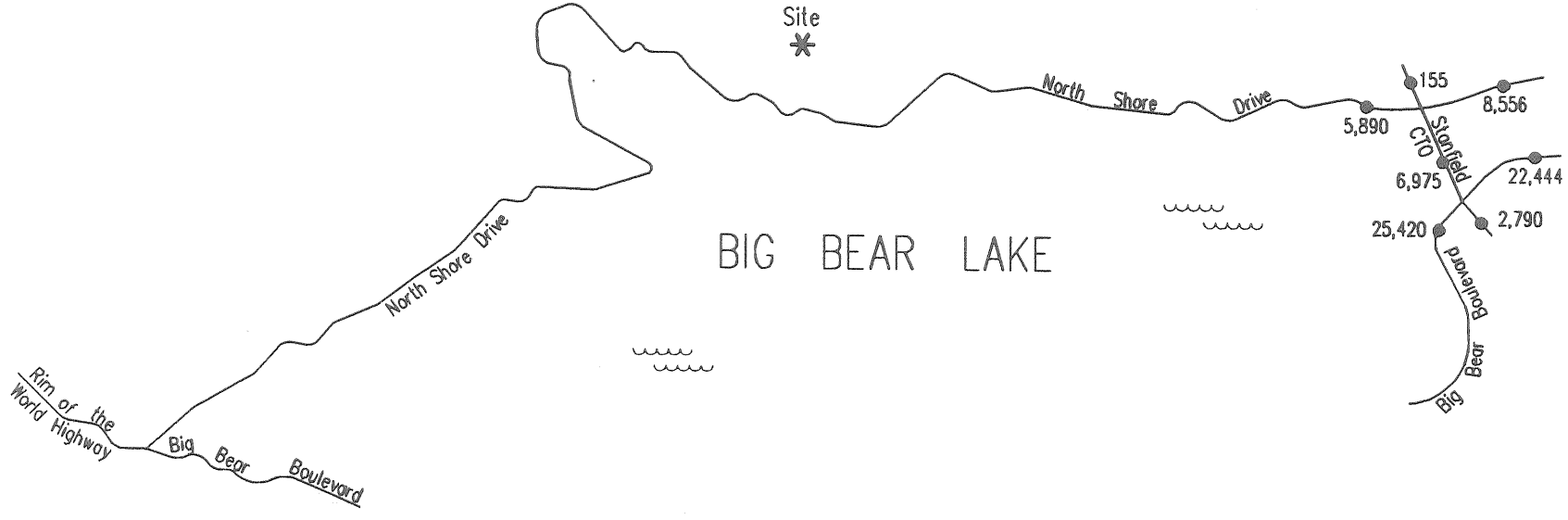
Figure 14
Year 2025 Daily Traffic Volumes – Peak Month*



* Peak month volumes are assumed to be 25 percent higher than average month

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10. Existing + Project + Other Development Traffic Conditions - Year 2025

Substantial additional development is presently planned in the vicinity of the site. To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. Figure 15 illustrates traffic conditions including other planned development with the project.

Other Development Growth - Year 2025

To account for growth which can be expected in the area, a growth rate of 1 percent per year compounded annually for 24 years has been assumed. The total compounded growth over 24 years is 24 percent. The basis of this growth rate assumption is the County of San Bernardino.

Cumulative Conditions Daily Traffic Volumes - Year 2025

Figure 15 displays the cumulative traffic volumes that exist in the peak month when the project traffic volumes and other future development traffic volumes are added to existing traffic volumes. See Table 6 for the calculation of intersection leg daily traffic volumes.

Cumulative Conditions Peak Hour Turning Movement Volumes - Year 2025

Appendix C contains plots of the cumulative conditions peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Cumulative Conditions Intersection Lanes - Year 2025

The Appendix C plots of peak hour turning movement volumes for each intersection also show the number of cumulative conditions intersection through and turning movement lanes. The lanes are also listed in Table 1.

Cumulative Conditions Intersection Delay - Year 2025

The Intersection Delay for the cumulative traffic conditions have been calculated and are shown in Table 1.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Cumulative Conditions Level of Service - Year 2025

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 1, it can be seen that the intersection of Stanfield Cutoff and Big Bear Boulevard operates at LOS F, with or without the project, without mitigation measures, whether using the Delay method or the ICU method. To accommodate year 2006 traffic, it is recommended that the eastbound right turn lane be converted to an eastbound through lane through the intersection. This mitigation measure also solves the 2025 traffic conditions.

The project does not have a significant impact on this intersection based on the thresholds of significance described in Section 2. It therefore is not required to help mitigate this deficiency.

Traffic Signal Warrants - Year 2025

Traffic signals will be warranted with or without the project at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. The applicability of Rural Warrants was previously discussed.

Traffic signal warrants have been adopted by the Federal Highway Administration and CalTrans. These warrants are based upon the eight highest hour volumes in a day. It is assumed by CalTrans that the eighth highest hour is 62.5 percent of the peak hour, and the peak hour is generally 10 percent of the daily traffic. Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5 shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal

warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

It should be noted that signals should be installed only when warranted and that installation of unwarranted signals can increase accident potential, energy consumption, and air pollutant emissions, while costing governmental jurisdictions approximately $500 per month for maintenance and utilities.

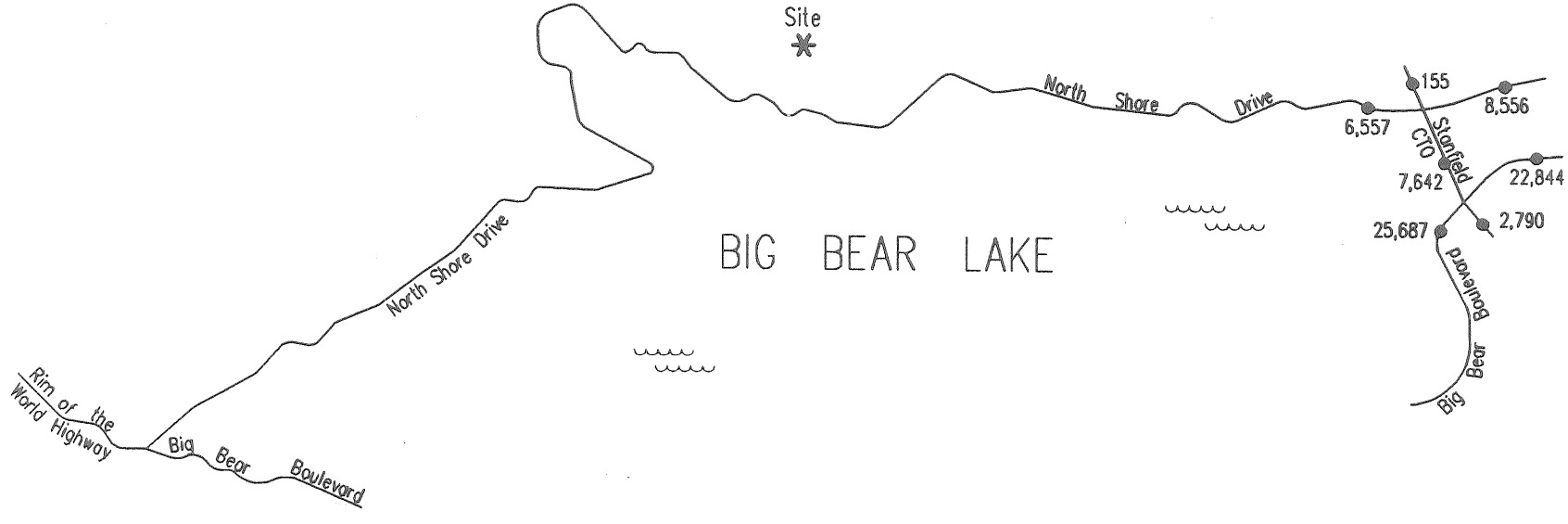
Pro Rata Share of Offsite Improvement Costs

Although the project does not significantly impact the intersection of Stanfield Cutoff and North Shore, nor the intersection of Stanfield Cutoff and Big Bear Boulevard per the thresholds discussed in Section 2 of this report, the County of San Bernardino has requested that a pro rata share of the cost of offsite mitigation measures be calculated.

Specifically, for Stanfield Cutoff and North Shore, the traffic signal is estimated by the County to cost $250,000. The sum of the peak month leg volumes today is 17,400 per Figure 6. The sum of the leg volumes in 2025 without the project is 21,576 per Figure 14. The project adds 1220 vehicles per day to the intersection leg volumes per Figure 8. The project's pro rata share is calculated as follows: 1220/(21,576+1220-17,400), or 22.61 percent the $250,000. The project's pro-rata share of the offsite improvement cost is $56,523.

Specifically, for Stanfield Cutoff and Big Bear Boulevard, the eastbound right turn lane needs to be converted to an eastbound through lane. This will involve adding pavement on the north side of the west leg of the intersection. It is estimated the amount of pavement needed is 12 feet wide by 300 feet long, plus a 600 foot 50 to 1 transition from the 12 feet added width back to zero feet added. This will involve 7,200 square feet of pavement at an estimated cost of $10 per square foot for construction and $15 per square foot for right of way, or $180,000. The $10.00 per square foot for construction is equivalent to $1.27 million for one lane mile in each direction. The sum of the peak month leg volumes today is 46,475 per Figure 6. The sum of the leg volumes in 2025 without the project is 57,629 per Figure 14. The project adds 1220 vehicles per day to the intersection leg volumes per Figure 8. The project's pro rata share is calculated as follows: 1220/(57,629+1220-46,475), or 9.86 percent the $180,000. The project's pro-rata share of the offsite improvement costs is $17,748.

Figure 15
Year 2025 Plus Project Daily Traffic Volumes – Peak Month



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11. Internal Circulation

Discussed below are site access and internal circulation.

Site Access

To assure smooth traffic operations for vehicles entering and exiting the site, a 150 foot left turn pocket on is recommended on North Shore Drive at each project access location. The County of San Bernardino has suggested that it should be a continuous left turn pocket across the frontage of the property. Because it is a State Highway, Caltrans will need to decide which they prefer.

There is a question of what the design requirements need to be in a mountain area. There are design standards and there are design guidelines. For the design standards, there is not much flexibility. For design speed, shoulder widths, and parkway size, there is flexibility. The maximum degree of flexibility should be considered by Caltrans, with safety being of paramount importance.

The available right of way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

This is a Caltrans decision subject to agreement by the County of San Bernardino.

A STOP sign should be installed to control outbound traffic on all site access roadways to North Shore Drive.

With more than one driveway, good emergency access is assured because there are two ways of reaching any point within the site.

Maintain a high level of service along arterials by restricting parking and controlling roadway access.

Landscape plantings and signs should be limited to 36 inches in height within 25 feet of project driveways to assure good visibility.

As is the case for any roadway design, the County should periodically review traffic operations in the vicinity of the

project once the project is constructed to assure that the traffic operations are satisfactory.

Internal Roadway Sizing

To identify future internal circulation needs to the project, future traffic volumes for roadways internal to the project have been determined. The maximum volume is approximately 400 vehicles per day which is satisfactory for a two lane road.

Internal Circulation

The traffic circulation internal to the proposed project has been reviewed from a traffic engineering viewpoint, and the findings are as follows:

Cul-de-sac Lengths: None of the cul-de-sacs have excessive length which is important for emergency equipment access.

Four-Legged Intersections: On arterials, four legged intersections are desirable to reduce turning movements, and expedite traffic movement. On local streets, four legged intersections are undesirable and the project has no four legged intersections on local streets.

Distance Between Intersections: It is desirable to place intersections at least two hundred feet apart. All intersections are 200 feet apart.

Grades: All grades are 10 percent or less, which is satisfactory.

Intersection Angle: All intersecting streets are perpendicular to one another. Intersections at other than 90 degrees are undesirable.

Visibility: All intersections are designed to afford adequate visibility.

It can be seen that the internal circulation is satisfactory in all aspects.

Appendices

Appendix A - Glossary of Transportation Terms

Appendix B - Explanation and Calculation of Intersection Delay

Appendix C - Existing Intersection Turning Movement Counts, Plots, and Estimation of Daily Traffic Volumes

APPENDIX A

Glossary of Transportation Terms

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
CalTrans:	California Department of Transportation
DU:	Dwelling Unit
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway which limits the amount of traffic which can proceed downstream from its location.

CAPACITY: The maximum number of vehicles which can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Same as yellow time.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic which will result in a volume during the peak hour equal to the capacity of the roadway.

DAILY TRAFFIC: Same as average daily traffic.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FIXED TIME SIGNAL: Same as pretimed signal.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections which are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

ORIGIN-DESTINATION SURVEY: A survey to determine the point of origin and the point of destination for a given vehicle trip.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal which directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal which directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination; i.e. each trip has two trip-ends. A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quality of trips produced and/or attracted attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length in miles.

APPENDIX B

Explanation and Calculation of Intersection Delay

EXPLANATION AND CALCULATION OF INTERSECTION LEVEL OF SERVICE (LOS) USING DELAY METHOD

The levels of service at the signalized intersections are calculated using the delay method in Chapter 9 of the 1994 Highway Capacity Manual (HCM). This method views an intersection as consisting of several lane groups. A lane group is a set of lanes serving a movement. If there are two northbound left turn lanes, then the lane group serving the northbound left turn movement has two lanes. Similarly, there may be three lanes in the lane group serving the northbound through movement, one lane in the lane group serving the northbound right turn movement, and so forth. It is also possible for one lane to serve two lane groups. A shared lane might result in there being 1.5 lanes in the northbound left turn lane group and 2.5 lanes in the northbound through lane group.

For each lane group, there is a capacity. That capacity is calculated by multiplying the number of lanes in the lane group times a theoretical maximum lane capacity per lane times 12 adjustment factors.

Each of the 12 adjustment factors has a value of approximately 1.00. A value less than 1.00 is generally assigned when a less than desirable condition occurs.

The 12 adjustment factors are as follows:

1. Peak hour factor (to account for peaking within the peak hour)
2. Lane utilization factor (to account for not all lanes loading equally)
3. Lane width
4. Percent of heavy trucks
5. Approach grade
6. Parking
7. Bus stops at intersections
8. Area type (CBD or other)
9. Right turns
10. Left turns

11. Pedestrian activity

12. Signal progression

The maximum theoretical lane capacity and the 12 adjustment factors for it are all unknowns for which approximate estimates have been recommended in the 1994 Highway Capacity Manual. For the most part, the recommended values are not based on statistical analysis but rather on educated estimates. However, it is possible to use the delay method and get reasonable results as will be discussed below.

Once the lane group volume is known and the lane group capacity is known, a volume to capacity ratio can be calculated for the lane group.

With a volume to capacity ratio calculated, average delay per vehicle in a lane group can be estimated. The average delay per vehicle in a lane group is calculated using a complex formula provided by the 1994 Highway Capacity Manual, which can be simplified and described as follows:

Delay per vehicle in a lane group is a function of the following:

1. Cycle length
2. Amount of red time faced by a lane group
3. Amount of yellow time for that lane group
4. The volume to capacity ratio of the lane group

The average delay per vehicle for each lane group is calculated, and eventually an overall average delay for all vehicles entering the intersection is calculated. This average delay per vehicle is then used to judge Level of Service. The Level of Services are defined in terms of delay as follows:

Level of Service	Average Stopped Delay Per Vehicle (Seconds)
A	0 to 5.00
B	5.01 to 15.00
C	15.01 to 25.00
D	25.01 to 40.00
E	40.01 to 60.00
F	60.01 and up

Level of Service is further described in the table that follows this discussion.

Experience has shown that when a maximum lane capacity of 1800 vehicles per hour is used (as recommended by HCM), little or no yellow time penalty is used, and none of the 12 penalty factors are applied, calculated delay is realistic. The delay calculation for instance assumes that yellow time is totally unused. Yet experience shows that most of the yellow time is used.

An idiosyncrasy of the delay method is that it is possible to add traffic to an intersection and reduce the average delay per vehicle. If the average delay is 30 seconds per vehicle for all vehicles traveling through an intersection, and traffic is added to a movement which has an average delay of 15 seconds per vehicle, then the overall average delay is reduced.

The delay calculation for a lane group is based on a concept that the delay is a function of the amount of unused capacity available. As the volume approaches capacity and there is no more unused capacity available, then the delay rapidly increases. Delay is not proportional to volume, but rather increases rapidly as the unused capacity approaches zero.

Because delay is not linearly related to volumes, the delay does not reflect how close an intersection is to overloading. If an intersection is operating at LOS C and has an average delay of 18 seconds per vehicle, you know very little as to what percent the traffic can increase before LOS E is reached,

Delay Calculation Software

The traffic analysis includes calculation of Intersection Delay and Level of Service using Kunzman Associates software.

The features of Kunzman Associates Delay Calculation software are as follows:

1. The Delay Calculation follows the 1994 Highway Capacity Manual procedures precisely.

2. The Delay Calculation table shows all input assumptions [lines (1) to (17)], all table look up values [lines (18) to (27)], and every calculation step [lines (28) to (44)].

3. Every number can be verified by the user. All formulas and calculation procedures are presented in the Delay Calculation table, including the Notes.

4. All calculated values are expressed to the nearest tenth so that the reader can verify for instance that the sum of the signal phases precisely equals the cycle length.

5. Signal phasing time is shown in lines (34) and (36).

6. Average delay per vehicle by movement is shown in line (39).

7. Percent of vehicles that have to stop by movement is shown in line (40).

8. Average vehicle queue length by movement is shown in line (41).

9. Rather than letting the pedestrian crossing times drive the signal cycle length, the user specifies the signal cycle length and the Delay Calculation table at the top indicates what cycle length is needed to satisfy pedestrians if they are present. Pedestrians are usually not present.

As it turns out, the cycle length required to satisfy pedestrian walk times depends on which leg the pedestrian crosses. All four legs can result in different minimum cycle lengths needed to satisfy the pedestrian crossing times.

As an example, assume the amount of time needed to cross the west leg or east leg of an intersection is 30 seconds. With left turn phasing and the traffic volumes present, assume the northbound through green goes on while the northbound left turns are still being served. After the northbound left turns are served, then the southbound through traffic is given a green indication.

Assume for a 100 second cycle, the northbound through green time is 35 seconds and the southbound through green time is 25 seconds. Because pedestrians crossing on the east leg can be given 35 seconds of green time while the northbound through is running, no additional time is needed to serve pedestrians crossing on the east leg.

Because pedestrians crossing on the west leg can only be given 25 seconds to cross while the southbound through has a green indication, the signal cycle length needs to be extended whenever there is a pedestrian on the west leg. In this example a 100 second cycle will serve the east leg pedestrian but not the west leg pedestrian.

If a pedestrian is on the west leg, and if the intersection is operating below capacity, then five seconds of green time can be borrowed from other phases and given to the southbound through phase, and a 100 second cycle still maintained. However, if the intersection is near capacity, then green time cannot be borrowed from other green phases, and the cycle length has to be extended to still operate at an acceptable Level of Service.

If the software user so desires, the methodology can be used to determine the maximum cycle length needed at all intersections along one street, then that cycle length can be specified at all intersections and the effect on delay determined.

The Delay Calculation refers to Notes at various locations. The Notes are contained on a separate page at the end of the delay calculations.

Unsignalized Intersections

Delay can also be calculated for two way stop and all way stop intersections.

Two way stop delay calculations are based on gap acceptance methodology. Essentially are there enough gaps in the main street (the one without a stop control) traffic volume to allow the side street volumes to cross or turn onto the main street. Also for left turns on the main street, are there enough gaps for the left turns. LOS is determined for all movements except the main street through and right turn movements. LOS is determined by a table look up method where many different threshold values are presented depending on lanes, subject volume and opposing volume.

All way stop delay calculations are based on a volume compared to a service rate methodology. Essentially the service rates are much lower than for a signal and are adjusted to account for lanes crossed, and opposing and crossing volumes among others. LOS is determined by a table look up method where many different threshold values are presented depending on lanes, subject volume and opposing volume.

The 1997 Highway Capacity Manual was used for signalized and unsignalized intersections.

LEVEL OF SERVICE DESCRIPTION
FOR DELAY METHOD (1997 METHODOLOGY)

Level of Service	Description	Stopped Delay Per Vehicle (Seconds)
A	Level of Service A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 10.0
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	10.1 to 20.0
C	Level of Service generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.1 to 35.0
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.1 to 55.0
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.1 to 80.0
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.1 +

Source: HIGHWAY CAPACITY MANUAL, Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 1997, Pages 9-6 to 9-7.

CALCULATION OF PEAK HOUR FACTORS

Intersection	Movement												
	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	TOTAL
Stanfield Cutoff (NS) and North Shore (EW)													
Morning Peak Hour													
Peak Hour Volume	0	53	47	0	0	0	19	59	0	45	0	311	534
Peak 15 Minutes	0	15	15	0	0	0	8	21	0	14	0	109	182
Peak Hour Factor	1.00	0.88	0.78	1.00	1.00	1.00	0.59	0.70	1.00	0.80	1.00	0.71	0.73
Adjusted Peak Hour Factor	1.00	0.88	0.78	1.00	1.00	1.00	0.59	0.70	1.00	0.80	1.00	0.71	0.73
Evening Peak Hour													
Peak Hour Volume	0	134	51	0	0	0	61	67	0	37	0	154	504
Peak 15 Minutes	0	37	14	0	0	0	16	18	0	10	0	39	134
Peak Hour Factor	1.00	0.91	0.91	1.00	1.00	1.00	0.95	0.93	1.00	0.93	1.00	0.99	0.94
Adjusted Peak Hour Factor	1.00	0.91	0.91	1.00	1.00	1.00	0.95	0.93	1.00	0.93	1.00	0.99	0.94
Stanfield Cutoff (NS) and Big Bear Boulevard (EW)													
Morning Peak Hour													
Peak Hour Volume	24	24	27	23	245	12	278	15	93	658	44	25	1468
Peak 15 Minutes	8	11	5	9	85	5	85	3	33	199	6	6	455
Peak Hour Factor	0.75	0.55	1.35	0.64	0.72	0.60	0.82	1.25	0.70	0.83	1.83	1.04	0.81
Adjusted Peak Hour Factor	0.75	0.55	1.00	0.64	0.72	0.60	0.82	1.00	0.70	0.83	1.00	1.00	0.81
Evening Peak Hour													
Peak Hour Volume	18	46	39	22	178	21	906	26	153	455	13	34	1911
Peak 15 Minutes	4	14	10	5	42	5	239	7	39	123	4	8	500
Peak Hour Factor	1.12	0.82	0.98	1.10	1.06	1.05	0.95	0.93	0.98	0.92	0.81	1.06	0.96
Adjusted Peak Hour Factor	1.00	0.82	0.98	1.00	1.00	1.00	0.95	0.93	0.98	0.92	0.81	1.00	0.96

Peak Hour Factor is the hourly flow rate in vehicles per hour divided by the peak 15 minute flow rate in vehicles per hour. The time periods used are based on the total intersection entering volumes. A Peak Hour Factor of 1.00 is used when a movement's Peak Hour Factor is greater than 1.00. This sometimes occurs on low volume movements.

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing

Traffic Condition: 2001 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 94 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	24	24	27	23	245	12	278	15	93	658	44	25	1468
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	25	25	28	282	0	13	293	16	98	693	46	26	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.15	0.00	0.01	0.15	0.01	0.05	0.36	0.02	0.01	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.19	0.00	0.11	0.19	0.11	0.11	0.40	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.19	0.00	0.00	0.00	0.00	0.11	0.40	0.00	0.00	.813
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.22	0.22	0.13	0.22	0.00	0.13	0.52	0.52	0.13	0.52	0.52	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	22.3	22.3	13.0	22.3	0.0	13.0	51.7	51.7	13.1	51.7	51.7	13.0	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	174	174	162	347	0	162	907	907	163	905	905	162	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.15	0.15	0.18	0.81	0.00	0.08	0.32	0.02	0.60	0.76	0.05	0.16	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.1	34.1	42.5	64.4	0.0	39.8	15.5	11.8	64.7	29.0	12.2	42.1	35.20
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	78	78	87	78	0	87	48	48	87	48	48	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	1.1	0.7	6.1	0.0	0.3	3.9	0.2	2.4	9.3	0.6	0.6	5.24
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D	E	A+	D+	B	B+	E	C	B+	D	D+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	37.1 Sec; LOS = D+			63.4 Sec; LOS = E			27.2 Sec; LOS = C			28.4 Sec; LOS = C			D+

Signal Timing, Secs: Phase 1 = 13.0; Phase 2 = 0.1; Phase 3 = 0.0; Phase 4 = 51.7; Phase 5 = 13.0; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 22.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.0; Phase 3 = 13.1; Phase 4 = 13.1; Phase 5 = 64.7; Phase 6 = 77.7; Phase 7 = 77.7; Phase 8 = 77.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing
Traffic Condition: 2001 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 128 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	18	46	39	22	178	21	906	26	153	455	13	34	1911
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	19	48	41	211	0	22	954	27	161	479	14	36	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.05	0.02	0.11	0.00	0.01	0.50	0.01	0.09	0.25	0.01	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.15	0.00	0.11	0.54	0.11	0.13	0.29	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.15	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.11	.912
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.17	0.17	0.10	0.16	0.00	0.10	0.63	0.63	0.14	0.59	0.59	0.10	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.6	16.6	10.4	16.3	0.0	10.1	63.1	63.1	14.0	59.4	59.4	10.3	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	120	120	115	233	0	109	1123	1123	180	1052	1052	113	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.16	0.41	0.36	0.90	0.00	0.20	0.85	0.02	0.89	0.46	0.01	0.32	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	40.3	53.0	55.4	93.8	0.0	48.0	27.1	7.0	102.8	13.6	8.4	53.2	38.56
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	83	83	90	84	0	90	37	37	86	41	41	90	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	0.9	2.2	1.0	4.9	0.0	0.6	9.8	0.3	3.8	5.4	0.2	0.9	6.40
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D-	E+	F	A+	D	C	A-	F-	B	A-	D-	D+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	51.7 Sec; LOS = D-			89.4 Sec; LOS = F			37.3 Sec; LOS = D+			16.2 Sec; LOS = B			D+

Signal Timing, Secs: Phase 1 = 10.3; Phase 2 = 3.7; Phase 3 = 0.0; Phase 4 = 59.4; Phase 5 = 10.1; Phase 6 = 0.3; Phase 7 = 0.0; Phase 8 = 16.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 10.3; Phase 3 = 14.0; Phase 4 = 14.0; Phase 5 = 73.4; Phase 6 = 83.4; Phase 7 = 83.7; Phase 8 = 83.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing
Traffic Condition: 2001 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 90 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	24	24	27	23	261	35	278	15	98	658	52	25	1520
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	25	25	28	299	0	37	293	16	103	693	55	26	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.16	0.00	0.02	0.15	0.01	0.06	0.36	0.03	0.01	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.20	0.00	0.11	0.19	0.11	0.11	0.40	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.20	0.00	0.00	0.00	0.00	0.11	0.40	0.00	0.00	.821
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.23	0.23	0.13	0.23	0.00	0.13	0.51	0.51	0.13	0.51	0.51	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	23.1	23.1	12.9	23.1	0.0	12.9	51.1	51.1	13.0	51.0	51.0	12.9	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	8	8	5	78	78	57	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	182	182	160	363	0	160	895	895	161	893	893	160	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.14	0.14	0.18	0.82	0.00	0.23	0.33	0.02	0.64	0.78	0.06	0.16	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	33.1	33.1	42.7	64.2	0.0	44.5	15.9	12.1	68.7	30.1	12.6	42.3	36.46
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	77	77	87	77	0	87	49	49	87	49	49	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	1.1	0.7	6.4	0.0	0.9	4.0	0.2	2.5	9.4	0.7	0.6	5.17
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D	E	A+	D	B	B+	E	C-	B+	D	D+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	36.6 Sec; LOS = D+			62.0 Sec; LOS = E+			29.0 Sec; LOS = C			29.3 Sec; LOS = C			D+

Signal Timing, Secs: Phase 1 = 12.9; Phase 2 = 0.1; Phase 3 = 0.0; Phase 4 = 51.0; Phase 5 = 12.9; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 23.1. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 12.9; Phase 3 = 13.0; Phase 4 = 13.0; Phase 5 = 64.0; Phase 6 = 76.9; Phase 7 = 76.9; Phase 8 = 76.9.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing
Traffic Condition: 2001 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 127 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	18	46	39	22	188	36	906	26	171	455	40	34	1981
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	19	48	41	221	0	38	954	27	180	479	42	36	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.05	0.02	0.12	0.00	0.02	0.50	0.01	0.10	0.25	0.02	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.16	0.00	0.11	0.54	0.11	0.14	0.29	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.16	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.11	.918
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.16	0.16	0.10	0.16	0.00	0.10	0.63	0.63	0.15	0.58	0.58	0.10	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.5	16.5	10.4	16.4	0.0	10.3	62.9	62.9	15.2	58.0	58.0	10.3	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	119	119	115	236	0	114	1119	1119	202	1026	1026	113	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.16	0.41	0.36	0.94	0.00	0.33	0.85	0.02	0.89	0.47	0.04	0.32	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	40.5	53.5	55.2	100.5	0.0	53.9	27.5	7.1	97.4	14.6	9.2	53.0	39.86
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	84	84	90	84	0	90	37	37	85	42	42	90	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	0.9	2.2	1.0	5.1	0.0	0.9	9.8	0.3	4.2	5.6	0.5	0.9	6.33
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D-	E+	F-	A+	D-	C	A-	F-	B	A-	D-	D+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	51.9 Sec; LOS = D-			93.7 Sec; LOS = F-			37.9 Sec; LOS = D+			16.6 Sec; LOS = B			D+

Signal Timing, Secs: Phase 1 = 10.3; Phase 2 = 4.9; Phase 3 = 0.0; Phase 4 = 58.0; Phase 5 = 10.3; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 16.4. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 10.3; Phase 3 = 15.2; Phase 4 = 15.2; Phase 5 = 73.2; Phase 6 = 83.5; Phase 7 = 83.6; Phase 8 = 83.6.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped

Traffic Condition: 2001 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 86 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	24	24	27	23	245	12	278	15	93	658	44	25	1468
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	25	25	28	282	0	13	308	0	98	739	0	26	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.15	0.00	0.01	0.08	0.00	0.05	0.19	0.00	0.01	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.19	0.00	0.11	0.12	0.00	0.11	0.23	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.19	0.00	0.00	0.00	0.00	0.11	0.23	0.00	0.00	.642
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.24	0.24	0.14	0.24	0.00	0.14	0.47	0.00	0.15	0.47	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	24.4	24.4	14.2	24.3	0.0	14.2	47.2	0.0	14.5	46.9	0.0	14.2	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	193	193	184	386	0	184	1643	0	189	1631	0	184	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.13	0.13	0.15	0.73	0.00	0.07	0.19	0.00	0.52	0.45	0.00	0.14	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	31.8	31.8	40.5	52.7	0.0	38.3	15.7	0.0	54.9	19.4	0.0	40.2	28.27
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	76	76	86	76	0	86	53	0	85	53	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	1.1	0.7	5.9	0.0	0.3	2.3	0.0	2.3	5.4	0.0	0.6	3.17
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D+	D-	A+	D+	B	A+	D-	B-	A+	D+	C
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	34.9 Sec; LOS = C-			52.0 Sec; LOS = D-			25.1 Sec; LOS = C			20.1 Sec; LOS = C+			C

Signal Timing, Secs: Phase 1 = 14.2; Phase 2 = 0.3; Phase 3 = 0.0; Phase 4 = 46.9; Phase 5 = 14.2; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 24.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 14.2; Phase 3 = 14.5; Phase 4 = 14.5; Phase 5 = 61.4; Phase 6 = 75.6; Phase 7 = 75.7; Phase 8 = 75.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped

Traffic Condition: 2001 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 110 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	18	46	39	22	178	21	906	26	153	455	13	34	1911
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	19	48	41	211	0	22	981	0	161	493	0	36	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.05	0.02	0.11	0.00	0.01	0.26	0.00	0.09	0.13	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.15	0.00	0.11	0.30	0.00	0.13	0.17	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.15	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.11	.668
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.19	0.19	0.14	0.19	0.00	0.14	0.53	0.00	0.19	0.48	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	19.3	19.3	14.3	19.0	0.0	14.0	52.5	0.0	18.6	48.1	0.0	14.2	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	146	146	185	285	0	179	1844	0	264	1674	0	183	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.13	0.33	0.22	0.74	0.00	0.12	0.53	0.00	0.61	0.29	0.00	0.20	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	36.4	44.5	42.4	62.1	0.0	39.9	17.4	0.0	53.3	16.4	0.0	41.7	26.75
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	81	81	86	81	0	86	47	0	81	52	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	0.8	2.2	1.0	4.7	0.0	0.5	6.5	0.0	3.6	3.6	0.0	0.9	4.36
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D	D	E+	A+	D+	B-	A+	D-	B	A+	D	C
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	42.3 Sec; LOS = D			60.0 Sec; LOS = E+			22.5 Sec; LOS = C+			18.1 Sec; LOS = B-			C

Signal Timing, Secs: Phase 1 = 14.2; Phase 2 = 4.5; Phase 3 = 0.0; Phase 4 = 48.1; Phase 5 = 14.0; Phase 6 = 0.3; Phase 7 = 0.0; Phase 8 = 19.0. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 14.2; Phase 3 = 18.6; Phase 4 = 18.6; Phase 5 = 66.7; Phase 6 = 80.7; Phase 7 = 81.0; Phase 8 = 81.0.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped

Traffic Condition: 2001 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 82 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	24	24	27	23	261	35	278	15	98	658	52	25	1520
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	25	25	28	299	0	37	308	0	103	747	0	26	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.16	0.00	0.02	0.08	0.00	0.06	0.20	0.00	0.01	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.20	0.00	0.11	0.12	0.00	0.11	0.24	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.20	0.00	0.00	0.00	0.00	0.11	0.24	0.00	0.00	.654
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.25	0.25	0.14	0.25	0.00	0.14	0.46	0.00	0.14	0.46	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	25.3	25.3	14.1	25.3	0.0	14.2	46.4	0.0	14.5	46.1	0.0	14.1	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	8	8	5	78	78	57	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	202	202	182	405	0	183	1611	0	188	1599	0	182	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.12	0.12	0.16	0.74	0.00	0.20	0.19	0.00	0.55	0.47	0.00	0.14	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	30.8	30.8	40.6	51.9	0.0	41.9	16.2	0.0	57.1	20.1	0.0	40.3	29.23
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	75	75	86	75	0	86	54	0	86	54	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.0	1.0	0.7	6.2	0.0	0.9	2.3	0.0	2.5	5.6	0.0	0.6	3.17
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D+	D-	A+	D	B	A+	E+	C+	A+	D+	C
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	34.4 Sec; LOS = C-			50.8 Sec; LOS = D-			26.4 Sec; LOS = C			20.8 Sec; LOS = C+			C

Signal Timing, Secs: Phase 1 = 14.1; Phase 2 = 0.3; Phase 3 = 0.0; Phase 4 = 46.1; Phase 5 = 14.1; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 25.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 14.1; Phase 3 = 14.5; Phase 4 = 14.5; Phase 5 = 60.5; Phase 6 = 74.7; Phase 7 = 74.7; Phase 8 = 74.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped
Traffic Condition: 2001 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 106 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	18	46	39	22	188	36	906	26	171	455	40	34	1981
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	19	48	41	221	0	38	981	0	180	521	0	36	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.05	0.02	0.12	0.00	0.02	0.26	0.00	0.10	0.14	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.16	0.00	0.11	0.30	0.00	0.14	0.18	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.16	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.11	.674
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.20	0.20	0.14	0.20	0.00	0.14	0.52	0.00	0.20	0.46	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	19.7	19.7	14.2	19.7	0.0	14.2	52.0	0.0	20.1	46.0	0.0	14.1	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	149	149	184	297	0	183	1824	0	290	1596	0	182	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.13	0.32	0.22	0.74	0.00	0.21	0.54	0.00	0.62	0.33	0.00	0.20	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	35.9	43.6	42.5	61.5	0.0	42.1	17.9	0.0	51.5	18.0	0.0	41.8	27.53
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	80	80	86	80	0	86	48	0	80	54	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	0.8	2.2	1.0	4.9	0.0	0.9	6.5	0.0	4.0	3.9	0.0	0.9	4.40
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D	D	E+	A+	D	B-	A+	D-	B-	A+	D	C
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	41.8 Sec; LOS = D			58.6 Sec; LOS = E+			23.1 Sec; LOS = C+			19.6 Sec; LOS = B-			C

Signal Timing, Secs: Phase 1 = 14.1; Phase 2 = 6.0; Phase 3 = 0.0; Phase 4 = 46.0; Phase 5 = 14.2; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 19.7. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 14.1; Phase 3 = 20.1; Phase 4 = 20.1; Phase 5 = 66.1; Phase 6 = 80.3; Phase 7 = 80.3; Phase 8 = 80.3.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing
Traffic Condition: 2001 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 91 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	30	30	34	29	306	15	348	19	116	823	55	31	1836
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	32	32	36	353	0	16	366	20	122	866	58	33	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.19	0.00	0.01	0.19	0.01	0.07	0.46	0.03	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.23	0.00	0.11	0.23	0.11	0.11	0.50	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.23	0.00	0.00	0.00	0.00	0.11	0.50	0.00	0.00	.941
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.23	0.23	0.11	0.23	0.00	0.11	0.55	0.55	0.11	0.54	0.54	0.11	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	23.0	23.0	11.2	23.0	0.0	11.2	54.5	54.5	11.3	54.5	54.5	11.2	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	181	181	130	361	0	130	960	960	131	959	959	130	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.17	0.17	0.28	0.98	0.00	0.12	0.38	0.02	0.93	0.90	0.06	0.25	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.3	34.3	49.0	92.6	0.0	43.0	14.9	10.5	125.9	40.1	10.9	47.9	49.29
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	77	77	89	77	0	89	45	45	89	46	46	89	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.4	1.4	0.9	7.5	0.0	0.4	4.6	0.3	3.0	11.0	0.7	0.8	6.20
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D-	F	A+	D	B	B+	F-	D+	B+	D	D-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	39.6 Sec; LOS = D+			90.5 Sec; LOS = F			41.4 Sec; LOS = D+			38.6 Sec; LOS = D+			D-

Signal Timing, Secs: Phase 1 = 11.2; Phase 2 = 0.1; Phase 3 = 0.0; Phase 4 = 54.5; Phase 5 = 11.2; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 23.0. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 11.2; Phase 3 = 11.3; Phase 4 = 11.3; Phase 5 = 65.8; Phase 6 = 77.0; Phase 7 = 77.0; Phase 8 = 77.0.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing
Traffic Condition: 2001 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 128 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	23	58	49	28	223	26	1133	33	191	569	16	43	2392
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	24	61	52	264	0	27	1193	35	201	599	17	45	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.06	0.03	0.14	0.00	0.02	0.63	0.02	0.11	0.32	0.01	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.18	0.00	0.11	0.67	0.11	0.15	0.36	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.18	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.11	1.06
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.17	0.17	0.09	0.16	0.00	0.09	0.66	0.66	0.14	0.61	0.61	0.09	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.6	16.6	9.0	16.3	0.0	8.7	65.8	65.8	14.1	60.6	60.6	8.9	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	120	120	90	234	0	84	1174	1174	181	1076	1076	88	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.20	0.51	0.58	1.13	0.00	0.33	1.02	0.03	1.11	0.56	0.02	0.51	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	42.0	60.9	80.7	155.6	0.0	58.9	54.6	6.0	161.3	15.0	7.9	74.1	64.27
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	83	83	91	84	0	91	34	34	86	39	39	91	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	2.8	1.3	6.1	0.0	0.7	11.3	0.3	4.8	6.5	0.2	1.1	7.52
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	D	E+	F+	F-	A+	E+	D-	A	F-	B	A-	E-	E
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	65.0 Sec; LOS = E			146.5 Sec; LOS = F-			68.4 Sec; LOS = E			18.9 Sec; LOS = B-			E

Signal Timing, Secs: Phase 1 = 8.9; Phase 2 = 5.2; Phase 3 = 0.0; Phase 4 = 60.6; Phase 5 = 8.7; Phase 6 = 0.3; Phase 7 = 0.0; Phase 8 = 16.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 8.9; Phase 3 = 14.1; Phase 4 = 14.1; Phase 5 = 74.7; Phase 6 = 83.4; Phase 7 = 83.7; Phase 8 = 83.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing
Traffic Condition: 2001 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 88 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	30	30	34	29	322	38	348	19	121	823	63	31	1888
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	32	32	36	369	0	40	366	20	127	866	66	33	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.19	0.00	0.02	0.19	0.01	0.07	0.46	0.03	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.23	0.00	0.11	0.23	0.11	0.11	0.50	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.23	0.00	0.00	0.00	0.00	0.11	0.50	0.00	0.00	.951
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.24	0.24	0.11	0.24	0.00	0.11	0.54	0.54	0.11	0.54	0.54	0.11	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	23.7	23.7	11.1	23.7	0.0	11.1	54.0	54.0	11.3	53.8	53.8	11.1	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	8	8	5	78	78	57	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	187	187	128	375	0	129	950	950	131	947	947	128	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.17	0.17	0.28	0.99	0.00	0.31	0.39	0.02	0.97	0.91	0.07	0.25	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	33.4	33.4	49.3	93.6	0.0	50.9	15.3	10.8	136.6	42.3	11.3	48.2	51.67
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	76	76	89	76	0	89	46	46	89	46	46	89	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.3	1.3	0.9	7.8	0.0	1.0	4.7	0.3	3.1	11.1	0.9	0.8	6.15
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D-	F	A+	D-	B	B+	F-	D	B+	D	D-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	39.2 Sec; LOS = D+			89.5 Sec; LOS = F			45.2 Sec; LOS = D			40.4 Sec; LOS = D+			D-

Signal Timing, Secs: Phase 1 = 11.1; Phase 2 = 0.2; Phase 3 = 0.0; Phase 4 = 53.8; Phase 5 = 11.1; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 23.7. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 11.1; Phase 3 = 11.3; Phase 4 = 11.3; Phase 5 = 65.1; Phase 6 = 76.3; Phase 7 = 76.3; Phase 8 = 76.3.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing

Traffic Condition: 2001 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 127 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	23	58	49	28	233	41	1133	33	209	569	43	43	2462
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	24	61	52	275	0	43	1193	35	220	599	45	45	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.06	0.03	0.14	0.00	0.02	0.63	0.02	0.12	0.32	0.02	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.18	0.00	0.11	0.67	0.11	0.16	0.36	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.18	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.11	1.07
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.17	0.17	0.09	0.16	0.00	0.09	0.66	0.66	0.15	0.59	0.59	0.09	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.6	16.6	9.0	16.4	0.0	8.9	65.6	65.6	15.1	59.5	59.5	8.9	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	119	119	90	236	0	88	1171	1171	199	1054	1054	88	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.20	0.51	0.57	1.16	0.00	0.49	1.02	0.03	1.10	0.57	0.04	0.51	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	42.2	61.3	80.4	166.5	0.0	71.9	55.4	6.1	154.3	16.0	8.5	73.9	66.08
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	83	83	91	84	0	91	34	34	85	41	41	91	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	2.8	1.3	6.4	0.0	1.1	11.4	0.3	5.2	6.7	0.5	1.1	7.46
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	D	E+	F+	F-	A+	E-	E+	A	F-	B	A-	E-	E
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	65.1 Sec; LOS = E			153.6 Sec; LOS = F-			69.2 Sec; LOS = E			19.3 Sec; LOS = B-			E

Signal Timing, Secs: Phase 1 = 8.9; Phase 2 = 6.2; Phase 3 = 0.0; Phase 4 = 59.5; Phase 5 = 8.9; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 16.4. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 8.9; Phase 3 = 15.1; Phase 4 = 15.1; Phase 5 = 74.6; Phase 6 = 83.4; Phase 7 = 83.6; Phase 8 = 83.6.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped

Traffic Condition: 2001 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 76 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	30	30	34	29	306	15	348	19	116	823	55	31	1836
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	32	32	36	353	0	16	386	0	122	924	0	33	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.19	0.00	0.01	0.10	0.00	0.07	0.24	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.23	0.00	0.11	0.14	0.00	0.11	0.28	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.23	0.00	0.00	0.00	0.00	0.11	0.28	0.00	0.00	.728
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.28	0.28	0.13	0.28	0.00	0.13	0.46	0.00	0.14	0.45	0.00	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	27.6	27.6	13.5	27.6	0.0	13.4	45.5	0.0	13.6	45.3	0.0	13.5	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	224	224	170	448	0	170	1578	0	174	1570	0	170	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.14	0.14	0.21	0.79	0.00	0.09	0.24	0.00	0.70	0.59	0.00	0.19	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	29.4	29.4	43.1	53.5	0.0	39.7	17.3	0.0	73.4	23.0	0.0	42.5	31.66
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	72	72	87	72	0	87	54	0	86	55	0	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.3	1.3	0.9	7.1	0.0	0.4	2.9	0.0	2.9	7.0	0.0	0.8	4.07
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C	C	D	D-	A+	D+	B-	A+	E-	C+	A+	D	C-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	34.3 Sec; LOS = C-			52.9 Sec; LOS = D-			30.8 Sec; LOS = C-			23.7 Sec; LOS = C+			C-

Signal Timing, Secs: Phase 1 = 13.5; Phase 2 = 0.2; Phase 3 = 0.0; Phase 4 = 45.3; Phase 5 = 13.4; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 27.6. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.5; Phase 3 = 13.6; Phase 4 = 13.6; Phase 5 = 59.0; Phase 6 = 72.4; Phase 7 = 72.4; Phase 8 = 72.4.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped
Traffic Condition: 2001 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 97 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	23	58	49	28	223	26	1133	33	191	569	16	43	2392
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	24	61	52	264	0	27	1227	0	201	616	0	45	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.06	0.03	0.14	0.00	0.02	0.32	0.00	0.11	0.16	0.00	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.18	0.00	0.11	0.36	0.00	0.15	0.20	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.18	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.11	.762
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.22	0.22	0.13	0.21	0.00	0.13	0.52	0.00	0.19	0.46	0.00	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	21.7	21.7	13.4	21.5	0.0	13.3	51.7	0.0	19.5	45.6	0.0	13.4	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	168	168	170	332	0	167	1812	0	278	1582	0	169	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.14	0.36	0.30	0.80	0.00	0.16	0.68	0.00	0.72	0.39	0.00	0.27	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.6	43.0	46.4	63.8	0.0	41.9	21.3	0.0	60.8	19.2	0.0	45.1	30.19
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	78	78	87	79	0	87	48	0	81	54	0	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	2.7	1.2	5.8	0.0	0.7	8.2	0.0	4.5	4.7	0.0	1.1	5.56
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	D	D	E	A+	D	C+	A+	E+	B-	A+	D	C-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	42.8 Sec; LOS = D			61.7 Sec; LOS = E+			26.8 Sec; LOS = C			20.9 Sec; LOS = C+			C-

Signal Timing, Secs: Phase 1 = 13.4; Phase 2 = 6.1; Phase 3 = 0.0; Phase 4 = 45.6; Phase 5 = 13.3; Phase 6 = 0.2; Phase 7 = 0.0; Phase 8 = 21.5. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.4; Phase 3 = 19.5; Phase 4 = 19.5; Phase 5 = 65.1; Phase 6 = 78.3; Phase 7 = 78.5; Phase 8 = 78.5.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW) — Traffic Condition: 2001 Peak Month With Project
Time Period: AM Peak Hour — Lanes: Restriped — Cycle Length: 100 Seconds — (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 72 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	30	30	34	29	322	38	348	19	121	823	63	31	1888
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	32	32	36	369	0	40	386	0	127	933	0	33	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.19	0.00	0.02	0.10	0.00	0.07	0.25	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.23	0.00	0.11	0.14	0.00	0.11	0.29	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.23	0.00	0.00	0.00	0.00	0.11	0.29	0.00	0.00	.740
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.29	0.29	0.14	0.29	0.00	0.14	0.44	0.00	0.15	0.43	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	28.8	28.8	13.7	28.9	0.0	13.8	43.7	0.0	14.7	42.7	0.0	13.7	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	8	8	5	78	78	57	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	236	236	175	473	0	176	1507	0	192	1471	0	175	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.13	0.13	0.20	0.78	0.00	0.23	0.26	0.00	0.66	0.63	0.00	0.19	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	28.2	28.2	42.5	51.3	0.0	43.2	18.5	0.0	66.0	25.9	0.0	42.0	32.73
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	71	71	86	71	0	86	56	0	85	57	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.2	1.2	0.9	7.3	0.0	1.0	3.0	0.0	3.0	7.4	0.0	0.8	4.19
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C	C	D	D-	A+	D	B-	A+	E	C	A+	D	C-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	33.4 Sec; LOS = C-			50.5 Sec; LOS = D-			30.3 Sec; LOS = C-			26.4 Sec; LOS = C			C-

Signal Timing, Secs: Phase 1 = 13.7; Phase 2 = 1.0; Phase 3 = 0.0; Phase 4 = 42.7; Phase 5 = 13.7; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 28.8. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.7; Phase 3 = 14.7; Phase 4 = 14.7; Phase 5 = 57.4; Phase 6 = 71.1; Phase 7 = 71.1; Phase 8 = 71.2.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped
Traffic Condition: 2001 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 95 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	23	58	49	28	233	41	1133	33	209	569	43	43	2462
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	24	61	52	275	0	43	1227	0	220	644	0	45	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.06	0.03	0.14	0.00	0.02	0.32	0.00	0.12	0.17	0.00	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.18	0.00	0.11	0.36	0.00	0.16	0.21	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.18	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.11	.767
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.22	0.22	0.13	0.22	0.00	0.13	0.51	0.00	0.21	0.44	0.00	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	22.1	22.1	13.4	22.0	0.0	13.3	51.3	0.0	20.7	43.9	0.0	13.3	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	172	172	169	343	0	168	1796	0	301	1515	0	168	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.14	0.36	0.31	0.80	0.00	0.26	0.68	0.00	0.73	0.43	0.00	0.27	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.1	42.0	46.6	63.5	0.0	44.9	21.7	0.0	59.3	20.8	0.0	45.3	30.99
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	78	78	87	78	0	87	49	0	79	56	0	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.0	2.6	1.2	5.9	0.0	1.0	8.3	0.0	4.8	5.0	0.0	1.1	5.59
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	D	D	E	A+	D	C+	A+	E+	C+	A+	D	C-

(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	42.3 Sec; LOS = D	61.0 Sec; LOS = E+	27.4 Sec; LOS = C	22.4 Sec; LOS = C+	C-

Signal Timing, Secs: Phase 1 = 13.3; Phase 2 = 7.4; Phase 3 = 0.0; Phase 4 = 43.9; Phase 5 = 13.3; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 22.0. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.3; Phase 3 = 20.7; Phase 4 = 20.7; Phase 5 = 64.6; Phase 6 = 77.9; Phase 7 = 78.0; Phase 8 = 78.0.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing

Traffic Condition: 2006 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 93 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	25	25	28	24	257	13	292	16	98	691	46	26	1541
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	26	26	29	296	0	14	307	17	103	727	48	27	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.16	0.00	0.01	0.16	0.01	0.06	0.38	0.03	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.20	0.00	0.11	0.20	0.11	0.11	0.42	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.20	0.00	0.00	0.00	0.00	0.11	0.42	0.00	0.00	.838
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.22	0.22	0.13	0.22	0.00	0.13	0.52	0.52	0.13	0.52	0.52	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	22.4	22.4	12.6	22.4	0.0	12.6	52.4	52.4	12.7	52.3	52.3	12.6	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	175	175	155	350	0	155	919	919	156	918	918	155	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.15	0.15	0.19	0.85	0.00	0.09	0.33	0.02	0.66	0.79	0.05	0.18	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.1	34.1	43.5	68.6	0.0	40.4	15.3	11.5	72.0	30.3	11.9	43.1	37.03
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	78	78	87	78	0	87	48	48	87	48	48	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	1.1	0.7	6.4	0.0	0.3	4.1	0.2	2.5	9.6	0.6	0.7	5.44
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D	E	A+	D+	B	B+	E-	C-	B+	D	D+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	37.5 Sec; LOS = D+			67.3 Sec; LOS = E			28.9 Sec; LOS = C			29.7 Sec; LOS = C			D+

Signal Timing, Secs: Phase 1 = 12.6; Phase 2 = 0.1; Phase 3 = 0.0; Phase 4 = 52.3; Phase 5 = 12.6; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 22.4. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 12.6; Phase 3 = 12.7; Phase 4 = 12.7; Phase 5 = 65.0; Phase 6 = 77.6; Phase 7 = 77.6; Phase 8 = 77.6.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing

Traffic Condition: 2006 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 128 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	19	48	41	23	187	22	951	27	161	478	14	36	2007
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	20	51	43	221	0	23	1001	28	169	503	15	38	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)]	0.02	0.05	0.02	0.12	0.00	0.01	0.53	0.01	0.09	0.26	0.01	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.16	0.00	0.11	0.57	0.11	0.13	0.30	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.16	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.11	.943
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.17	0.17	0.10	0.16	0.00	0.10	0.64	0.64	0.14	0.60	0.60	0.10	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.6	16.6	10.1	16.3	0.0	9.7	63.7	63.7	14.0	59.6	59.6	10.0	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	120	120	109	233	0	103	1134	1134	181	1057	1057	108	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.17	0.42	0.40	0.95	0.00	0.22	0.88	0.03	0.94	0.48	0.01	0.35	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	40.6	54.2	58.7	103.6	0.0	49.6	30.2	6.8	112.3	13.9	8.3	56.1	42.01
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	83	83	90	84	0	90	36	36	86	40	40	90	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	0.9	2.3	1.1	5.1	0.0	0.6	10.1	0.3	4.0	5.6	0.2	0.9	6.63
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D-	E+	F-	A+	D-	C-	A-	F-	B	A-	E+	D
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	53.5 Sec; LOS = D-			98.4 Sec; LOS = F-			41.2 Sec; LOS = D+			16.6 Sec; LOS = B			D

Signal Timing, Secs: Phase 1 = 10.0; Phase 2 = 4.1; Phase 3 = 0.0; Phase 4 = 59.6; Phase 5 = 9.7; Phase 6 = 0.3; Phase 7 = 0.0; Phase 8 = 16.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 10.0; Phase 3 = 14.0; Phase 4 = 14.0; Phase 5 = 73.7; Phase 6 = 83.4; Phase 7 = 83.7; Phase 8 = 83.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing

Traffic Condition: 2006 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 90 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	25	25	28	24	273	36	292	16	103	691	54	26	1593
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	26	26	29	313	0	38	307	17	108	727	57	27	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.16	0.00	0.02	0.16	0.01	0.06	0.38	0.03	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.20	0.00	0.11	0.20	0.11	0.11	0.42	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.20	0.00	0.00	0.00	0.00	0.11	0.42	0.00	0.00	.847
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.23	0.23	0.13	0.23	0.00	0.13	0.52	0.52	0.13	0.52	0.52	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	23.2	23.2	12.5	23.2	0.0	12.5	51.7	51.7	12.6	51.7	51.7	12.5	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	8	8	5	78	78	57	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	183	183	153	366	0	153	907	907	154	906	906	153	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.14	0.14	0.19	0.85	0.00	0.25	0.34	0.02	0.70	0.80	0.06	0.18	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	33.2	33.2	43.7	68.5	0.0	45.7	15.8	11.8	77.2	31.6	12.3	43.3	38.44
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	77	77	87	77	0	87	48	48	87	48	48	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	1.1	0.7	6.7	0.0	0.9	4.1	0.2	2.6	9.8	0.8	0.7	5.37
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D	E	A+	D	B	B+	E-	C-	B+	D	D+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	36.9 Sec; LOS = D+			66.0 Sec; LOS = E			31.0 Sec; LOS = C-			30.6 Sec; LOS = C-			D+

Signal Timing, Secs: Phase 1 = 12.5; Phase 2 = 0.1; Phase 3 = 0.0; Phase 4 = 51.7; Phase 5 = 12.5; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 23.2. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 12.5; Phase 3 = 12.6; Phase 4 = 12.6; Phase 5 = 64.2; Phase 6 = 76.8; Phase 7 = 76.8; Phase 8 = 76.8.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing
Traffic Condition: 2006 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 127 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	19	48	41	23	197	37	951	27	179	478	41	36	2077
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	20	51	43	232	0	39	1001	28	188	503	43	38	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.05	0.02	0.12	0.00	0.02	0.53	0.01	0.10	0.26	0.02	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.16	0.00	0.11	0.57	0.11	0.14	0.30	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.16	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.11	.948
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.16	0.16	0.10	0.16	0.00	0.10	0.64	0.64	0.15	0.58	0.58	0.10	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.5	16.5	10.1	16.4	0.0	10.0	63.5	63.5	15.2	58.3	58.3	10.0	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	119	119	109	236	0	108	1131	1131	202	1031	1031	108	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.17	0.43	0.39	0.98	0.00	0.36	0.89	0.03	0.93	0.49	0.04	0.35	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	40.8	54.6	58.6	111.3	0.0	56.5	30.6	6.8	106.5	14.8	9.0	56.0	43.43
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	84	84	90	84	0	90	36	36	85	42	42	90	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	0.9	2.3	1.1	5.4	0.0	1.0	10.1	0.3	4.4	5.8	0.5	0.9	6.56
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D-	E+	F-	A+	E+	C-	A-	F-	B	A-	E+	D
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	53.7 Sec; LOS = D-			103.4 Sec; LOS = F-			41.8 Sec; LOS = D			17.1 Sec; LOS = B-			D

Signal Timing, Secs: Phase 1 = 10.0; Phase 2 = 5.2; Phase 3 = 0.0; Phase 4 = 58.3; Phase 5 = 10.0; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 16.4. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 10.0; Phase 3 = 15.2; Phase 4 = 15.2; Phase 5 = 73.5; Phase 6 = 83.5; Phase 7 = 83.6; Phase 8 = 83.6.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped
Traffic Condition: 2006 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 85 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	25	25	28	24	257	13	292	16	98	691	46	26	1541
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	26	26	29	296	0	14	324	0	103	776	0	27	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.16	0.00	0.01	0.09	0.00	0.06	0.20	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.20	0.00	0.11	0.13	0.00	0.11	0.24	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.20	0.00	0.00	0.00	0.00	0.11	0.24	0.00	0.00	.659
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.25	0.25	0.14	0.25	0.00	0.14	0.48	0.00	0.14	0.47	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	24.6	24.6	13.9	24.6	0.0	13.8	47.7	0.0	14.2	47.4	0.0	13.9	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	196	196	177	392	0	177	1660	0	183	1648	0	177	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.13	0.13	0.17	0.76	0.00	0.08	0.20	0.00	0.56	0.47	0.00	0.15	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	31.7	31.7	41.2	54.5	0.0	38.9	15.5	0.0	58.9	19.4	0.0	40.9	28.85
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	75	75	86	75	0	86	52	0	86	53	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	1.1	0.7	6.2	0.0	0.3	2.4	0.0	2.5	5.7	0.0	0.7	3.30
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D+	D-	A+	D+	B	A+	E+	B-	A+	D+	C
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	35.1 Sec; LOS = D+			53.8 Sec; LOS = D-			26.0 Sec; LOS = C			20.1 Sec; LOS = C+			C

Signal Timing, Secs: Phase 1 = 13.9; Phase 2 = 0.3; Phase 3 = 0.0; Phase 4 = 47.4; Phase 5 = 13.8; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 24.6. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 =. 0.0; Phase 2 = 13.9; Phase 3 = 14.2; Phase 4 = 14.2; Phase 5 = 61.5; Phase 6 = 75.4; Phase 7 = 75.4; Phase 8 = 75.4.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped
Traffic Condition: 2006 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 109 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	19	48	41	23	187	22	951	27	161	478	14	36	2007
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	20	51	43	221	0	23	1029	0	169	518	0	38	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.05	0.02	0.12	0.00	0.01	0.27	0.00	0.09	0.14	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.16	0.00	0.11	0.31	0.00	0.13	0.18	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.16	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.11	.687
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.20	0.20	0.14	0.19	0.00	0.14	0.53	0.00	0.19	0.48	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	19.5	19.5	13.9	19.2	0.0	13.6	53.1	0.0	18.8	48.1	0.0	13.8	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	147	147	178	289	0	173	1865	0	266	1676	0	177	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.14	0.34	0.24	0.77	0.00	0.13	0.55	0.00	0.64	0.31	0.00	0.21	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	36.4	44.8	43.5	64.8	0.0	40.6	17.5	0.0	54.8	16.6	0.0	42.7	27.28
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	80	80	86	81	0	86	47	0	81	52	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	0.9	2.3	1.0	5.0	0.0	0.6	6.7	0.0	3.8	3.7	0.0	0.9	4.54
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D	D	E	A+	D+	B-	A+	D-	B	A+	D	C
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	42.8 Sec; LOS = D			62.5 Sec; LOS = E+			22.8 Sec; LOS = C+			18.4 Sec; LOS = B-			C

Signal Timing, Secs: Phase 1 = 13.8; Phase 2 = 5.0; Phase 3 = 0.0; Phase 4 = 48.1; Phase 5 = 13.6; Phase 6 = 0.3; Phase 7 = 0.0; Phase 8 = 19.2. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.8; Phase 3 = 18.8; Phase 4 = 18.8; Phase 5 = 66.9; Phase 6 = 80.5; Phase 7 = 80.8; Phase 8 = 80.8.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped
Traffic Condition: 2006 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 82 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	25	25	28	24	273	36	292	16	103	691	54	26	1593
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	26	26	29	313	0	38	324	0	108	784	0	27	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.16	0.00	0.02	0.09	0.00	0.06	0.21	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.20	0.00	0.11	0.13	0.00	0.11	0.25	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.20	0.00	0.00	0.00	0.00	0.11	0.25	0.00	0.00	.670
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.26	0.26	0.14	0.26	0.00	0.14	0.47	0.00	0.14	0.47	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	25.6	25.6	13.8	25.6	0.0	13.8	46.9	0.0	14.1	46.6	0.0	13.8	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	8	8	5	78	78	57	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	205	205	176	410	0	176	1630	0	182	1617	0	176	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.13	0.13	0.17	0.76	0.00	0.22	0.20	0.00	0.60	0.48	0.00	0.16	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	30.7	30.7	41.4	53.8	0.0	42.8	16.0	0.0	61.6	20.1	0.0	41.0	29.85
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	74	74	86	74	0	86	53	0	86	53	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	1.1	0.7	6.5	0.0	0.9	2.4	0.0	2.6	5.8	0.0	0.7	3.31
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D+	D-	A+	D	B	A+	E+	C+	A+	D+	C
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	34.6 Sec; LOS = C-			52.6 Sec; LOS = D-			27.4 Sec; LOS = C			20.8 Sec; LOS = C+			C

Signal Timing, Secs: Phase 1 = 13.8; Phase 2 = 0.3; Phase 3 = 0.0; Phase 4 = 46.6; Phase 5 = 13.8; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 25.6. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.8; Phase 3 = 14.1; Phase 4 = 14.1; Phase 5 = 60.7; Phase 6 = 74.4; Phase 7 = 74.4; Phase 8 = 74.4.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped
Traffic Condition: 2006 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 105 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	19	48	41	23	197	37	951	27	179	478	41	36	2077
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	20	51	43	232	0	39	1029	0	188	546	0	38	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.05	0.02	0.12	0.00	0.02	0.27	0.00	0.10	0.14	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.16	0.00	0.11	0.31	0.00	0.14	0.18	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.16	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.11	.692
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.20	0.20	0.14	0.20	0.00	0.14	0.53	0.00	0.20	0.46	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	19.9	19.9	13.9	19.8	0.0	13.8	52.6	0.0	20.2	46.1	0.0	13.8	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	151	151	178	300	0	176	1845	0	292	1600	0	176	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.13	0.34	0.24	0.77	0.00	0.22	0.56	0.00	0.64	0.34	0.00	0.22	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	35.9	43.9	43.6	64.2	0.0	43.0	17.9	0.0	53.1	18.2	0.0	42.8	28.05
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	80	80	86	80	0	86	47	0	80	54	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	0.9	2.2	1.0	5.2	0.0	0.9	6.8	0.0	4.2	4.1	0.0	0.9	4.58
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D	D	E	A+	D	B-	A+	D-	B-	A+	D	C
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	42.4 Sec; LOS = D			61.1 Sec; LOS = E+			23.3 Sec; LOS = C+			19.8 Sec; LOS = B-			C

Signal Timing, Secs: Phase 1 = 13.8; Phase 2 = 6.5; Phase 3 = 0.0; Phase 4 = 46.1; Phase 5 = 13.8; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 19.8. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.8; Phase 3 = 20.2; Phase 4 = 20.2; Phase 5 = 66.3; Phase 6 = 80.1; Phase 7 = 80.2; Phase 8 = 80.2.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing
Traffic Condition: 2006 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 90 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	32	32	35	30	322	16	365	20	122	864	58	33	1929
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HOM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	34	34	37	371	0	17	384	21	128	909	61	35	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.04	0.04	0.02	0.20	0.00	0.01	0.20	0.01	0.07	0.48	0.03	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.24	0.00	0.11	0.24	0.11	0.11	0.52	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.24	0.00	0.00	0.00	0.00	0.11	0.52	0.00	0.00	.975
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.23	0.23	0.11	0.23	0.00	0.11	0.55	0.55	0.11	0.55	0.55	0.11	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	23.2	23.2	10.8	23.2	0.0	10.8	55.2	55.2	11.0	55.0	55.0	10.8	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	182	182	123	364	0	123	972	972	127	968	968	123	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.19	0.19	0.30	1.02	0.00	0.14	0.40	0.02	1.01	0.94	0.06	0.28	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.5	34.5	50.9	103.3	0.0	44.1	14.8	10.2	149.8	45.6	10.7	50.1	55.26
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	77	77	89	77	0	89	45	45	89	45	45	89	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.4	1.4	0.9	7.9	0.0	0.4	4.8	0.3	3.2	11.4	0.8	0.9	6.43
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D-	F-	A+	D	B	B+	F-	D	B+	D-	E+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	40.3 Sec; LOS = D+			100.7 Sec; LOS = F-			47.1 Sec; LOS = D			43.6 Sec; LOS = D			E+

Signal Timing, Secs: Phase 1 = 10.8; Phase 2 = 0.2; Phase 3 = 0.0; Phase 4 = 55.0; Phase 5 = 10.8; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 23.2. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 10.8; Phase 3 = 11.0; Phase 4 = 11.0; Phase 5 = 66.0; Phase 6 = 76.8; Phase 7 = 76.8; Phase 8 = 76.8.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing

Traffic Condition: 2006 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 128 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	24	60	51	29	234	28	1189	34	201	597	17	45	2509
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	25	63	54	277	0	29	1252	36	212	628	18	47	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)]	0.03	0.07	0.03	0.15	0.00	0.02	0.66	0.02	0.12	0.33	0.01	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.19	0.00	0.11	0.70	0.11	0.16	0.37	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.19	0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.11	1.10
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.17	0.17	0.09	0.16	0.00	0.08	0.66	0.66	0.14	0.61	0.61	0.09	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.6	16.6	8.7	16.3	0.0	8.4	66.4	66.4	14.1	60.9	60.9	8.6	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	120	120	85	234	0	79	1185	1185	182	1081	1081	83	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.21	0.53	0.64	1.18	0.00	0.37	1.06	0.03	1.16	0.58	0.02	0.57	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	42.4	62.5	91.0	174.3	0.0	63.7	66.0	5.8	178.7	15.5	7.8	82.7	73.62
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	83	83	91	84	0	92	34	34	86	39	39	91	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.2	2.9	1.4	6.4	0.0	0.7	11.7	0.3	5.0	6.8	0.2	1.2	7.79
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	D	E+	F	F-	A+	E	E	A	F-	B	A-	F+	E-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	69.7 Sec; LOS = E			163.6 Sec; LOS = F-			80.5 Sec; LOS = F+			19.9 Sec; LOS = B-			E-

Signal Timing, Secs: Phase 1 = 8.6; Phase 2 = 5.5; Phase 3 = 0.0; Phase 4 = 60.9; Phase 5 = 8.4; Phase 6 = 0.3; Phase 7 = 0.0; Phase 8 = 16.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = .0.0; Phase 2 = 8.6; Phase 3 = 14.1; Phase 4 = 14.1; Phase 5 = 75.0; Phase 6 = 83.4; Phase 7 = 83.7; Phase 8 = 83.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing

Traffic Condition: 2006 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 88 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	32	32	35	30	338	39	365	20	127	864	66	33	1981
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	34	34	37	387	0	41	384	21	134	909	69	35	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)]	0.04	0.04	0.02	0.20	0.00	0.02	0.20	0.01	0.07	0.48	0.04	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.24	0.00	0.11	0.24	0.11	0.11	0.52	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.24	0.00	0.00	0.00	0.00	0.11	0.52	0.00	0.00	.986
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.24	0.24	0.11	0.24	0.00	0.11	0.55	0.55	0.11	0.54	0.54	0.11	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	23.8	23.8	10.7	23.8	0.0	10.7	54.7	54.7	11.2	54.2	54.2	10.7	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	8	8	5	78	78	57	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	188	188	121	376	0	121	964	964	130	955	955	121	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.18	0.18	0.30	1.03	0.00	0.34	0.40	0.02	1.03	0.95	0.07	0.29	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	33.7	33.7	51.4	105.3	0.0	53.2	15.1	10.4	152.9	48.8	11.1	50.5	57.78
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	76	76	89	76	0	89	45	45	89	46	46	89	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.4	1.4	0.9	8.2	0.0	1.0	4.8	0.3	3.3	11.6	0.9	0.9	6.39
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D-	F-	A+	D-	B	B+	F-	D-	B+	D-	E+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	40.0 Sec; LOS = D+			100.3 Sec; LOS = F-			49.1 Sec; LOS = D-			46.2 Sec; LOS = D			E+

Signal Timing, Secs: Phase 1 = 10.7; Phase 2 = 0.5; Phase 3 = 0.0; Phase 4 = 54.2; Phase 5 = 10.7; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 23.8. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 10.7; Phase 3 = 11.2; Phase 4 = 11.2; Phase 5 = 65.5; Phase 6 = 76.2; Phase 7 = 76.2; Phase 8 = 76.2.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing

Traffic Condition: 2006 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 127 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	24	60	51	29	244	43	1189	34	219	597	44	45	2579
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	25	63	54	287	0	45	1252	36	231	628	46	47	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.07	0.03	0.15	0.00	0.03	0.66	0.02	0.13	0.33	0.02	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.19	0.00	0.11	0.70	0.11	0.17	0.37	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.19	0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.11	1.10
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.17	0.17	0.09	0.16	0.00	0.09	0.66	0.66	0.15	0.60	0.60	0.09	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.5	16.5	8.7	16.4	0.0	8.6	66.2	66.2	15.1	59.8	59.8	8.6	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	119	119	85	236	0	83	1182	1182	200	1060	1060	83	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.21	0.53	0.63	1.22	0.00	0.55	1.06	0.03	1.16	0.59	0.04	0.57	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	42.6	63.0	90.7	185.9	0.0	79.9	66.9	5.9	171.5	16.5	8.4	82.4	75.53
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	83	83	91	84	0	91	34	34	85	40	40	91	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.2	2.9	1.4	6.7	0.0	1.1	11.7	0.3	5.4	7.0	0.5	1.2	7.73
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	D	E+	F	F-	A+	E-	E	A	F-	B	A-	F+	E-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	69.8 Sec; LOS = E			171.5 Sec; LOS = F-			81.3 Sec; LOS = F+			20.3 Sec; LOS = C+			E-

Signal Timing, Secs: Phase 1 = 8.6; Phase 2 = 6.5; Phase 3 = 0.0; Phase 4 = 59.8; Phase 5 = 8.6; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 16.4. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 8.6; Phase 3 = 15.1; Phase 4 = 15.1; Phase 5 = 74.9; Phase 6 = 83.5; Phase 7 = 83.6; Phase 8 = 83.6.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped

Traffic Condition: 2006 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 73 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	32	32	35	30	322	16	365	20	122	864	58	33	1929
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	34	34	37	371	0	17	405	0	128	971	0	35	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)]	0.04	0.04	0.02	0.20	0.00	0.01	0.11	0.00	0.07	0.26	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.24	0.00	0.11	0.15	0.00	0.11	0.30	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.24	0.00	0.00	0.00	0.00	0.11	0.30	0.00	0.00	.751
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.29	0.29	0.14	0.28	0.00	0.13	0.45	0.00	0.14	0.44	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	28.6	28.6	13.5	28.5	0.0	13.3	44.5	0.0	14.5	43.5	0.0	13.5	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	234	234	171	465	0	168	1539	0	189	1501	0	171	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.14	0.14	0.21	0.80	0.00	0.10	0.26	0.00	0.68	0.65	0.00	0.20	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	28.6	28.6	43.1	53.3	0.0	40.0	18.1	0.0	68.1	25.7	0.0	42.8	32.72
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	71	71	86	72	0	87	55	0	86	56	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.3	1.3	0.9	7.4	0.0	0.4	3.1	0.0	3.0	7.6	0.0	0.8	4.39
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C	C	D	D-	A+	D+	B-	A+	E	C	A+	D	C-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	33.8 Sec; LOS = C-			52.7 Sec; LOS = D-			30.2 Sec; LOS = C-			26.3 Sec; LOS = C			C-

Signal Timing, Secs: Phase 1 = 13.5; Phase 2 = 1.0; Phase 3 = 0.0; Phase 4 = 43.5; Phase 5 = 13.3; Phase 6 = 0.2; Phase 7 = 0.0; Phase 8 = 28.5. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.5; Phase 3 = 14.5; Phase 4 = 14.5; Phase 5 = 58.0; Phase 6 = 71.4; Phase 7 = 71.5; Phase 8 = 71.5.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped

Traffic Condition: 2006 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 96 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	24	60	51	29	234	28	1189	34	201	597	17	45	2509
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	25	63	54	277	0	29	1287	0	212	646	0	47	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.07	0.03	0.15	0.00	0.02	0.34	0.00	0.12	0.17	0.00	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.19	0.00	0.11	0.38	0.00	0.16	0.21	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.19	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.11	.784
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.22	0.22	0.13	0.22	0.00	0.13	0.52	0.00	0.20	0.46	0.00	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	21.8	21.8	13.1	21.6	0.0	12.9	52.3	0.0	19.6	45.7	0.0	13.0	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	169	169	163	335	0	160	1835	0	281	1584	0	162	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.15	0.37	0.33	0.83	0.00	0.18	0.70	0.00	0.75	0.41	0.00	0.29	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.6	43.2	48.0	67.4	0.0	42.9	21.6	0.0	63.5	19.4	0.0	46.6	31.10
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	78	78	87	78	0	87	48	0	80	54	0	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	2.7	1.3	6.0	0.0	0.7	8.5	0.0	4.7	4.9	0.0	1.1	5.78
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	D	D	E	A+	D	C+	A+	E	B-	A+	D	C-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	43.5 Sec; LOS = D			65.0 Sec; LOS = E			27.5 Sec; LOS = C			21.3 Sec; LOS = C+			C-

Signal Timing, Secs: Phase 1 = 13.0; Phase 2 = 6.6; Phase 3 = 0.0; Phase 4 = 45.7; Phase 5 = 12.9; Phase 6 = 0.2; Phase 7 = 0.0; Phase 8 = 21.6. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.0; Phase 3 = 19.6; Phase 4 = 19.6; Phase 5 = 65.3; Phase 6 = 78.2; Phase 7 = 78.4; Phase 8 = 78.4.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped

Traffic Condition: 2006 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 72 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	32	32	35	30	338	39	365	20	127	864	66	33	1981
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	34	34	37	387	0	41	405	0	134	979	0	35	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)]	0.04	0.04	0.02	0.20	0.00	0.02	0.11	0.00	0.07	0.26	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.24	0.00	0.11	0.15	0.00	0.11	0.30	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.24	0.00	0.00	0.00	0.00	0.11	0.30	0.00	0.00	.765
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.29	0.29	0.13	0.29	0.00	0.13	0.44	0.00	0.15	0.43	0.00	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	29.0	29.0	13.3	29.1	0.0	13.3	44.4	0.0	14.6	43.0	0.0	13.3	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	8	8	5	78	78	57	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	238	238	167	476	0	168	1534	0	192	1482	0	167	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.14	0.14	0.22	0.81	0.00	0.24	0.26	0.00	0.70	0.66	0.00	0.21	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	28.3	28.3	43.6	54.4	0.0	44.4	18.2	0.0	69.6	26.4	0.0	43.2	33.79
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	71	71	87	71	0	87	56	0	85	57	0	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.3	1.3	0.9	7.6	0.0	1.0	3.1	0.0	3.2	7.7	0.0	0.8	4.37
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C	C	D	D-	A+	D	B-	A+	E	C	A+	D	C-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	33.7 Sec; LOS = C-			53.4 Sec; LOS = D-			31.0 Sec; LOS = C-			27.0 Sec; LOS = C			C-

Signal Timing, Secs: Phase 1 = 13.3; Phase 2 = 1.4; Phase 3 = 0.0; Phase 4 = 43.0; Phase 5 = 13.3; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 29.0. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.3; Phase 3 = 14.6; Phase 4 = 14.6; Phase 5 = 57.6; Phase 6 = 70.9; Phase 7 = 70.9; Phase 8 = 71.0.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped

Traffic Condition: 2006 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 94 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	24	60	51	29	244	43	1189	34	219	597	44	45	2579
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	25	63	54	287	0	45	1287	0	231	675	0	47	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.07	0.03	0.15	0.00	0.03	0.34	0.00	0.13	0.18	0.00	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.19	0.00	0.11	0.38	0.00	0.17	0.22	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.19	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.11	.790
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.22	0.22	0.13	0.22	0.00	0.13	0.52	0.00	0.21	0.44	0.00	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	22.2	22.2	13.0	22.2	0.0	12.9	51.9	0.0	20.8	44.0	0.0	13.0	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	173	173	162	345	0	161	1819	0	303	1519	0	161	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.15	0.36	0.33	0.83	0.00	0.28	0.71	0.00	0.76	0.44	0.00	0.29	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.1	42.3	48.3	67.2	0.0	46.3	22.1	0.0	62.1	21.0	0.0	46.8	31.92
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	78	78	87	78	0	87	48	0	79	56	0	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	2.7	1.3	6.2	0.0	1.1	8.6	0.0	5.1	5.2	0.0	1.1	5.82
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	D	D	E	A+	D	C+	A+	E+	C+	A+	D	C-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	43.1 Sec; LOS = D			64.4 Sec; LOS = E			28.1 Sec; LOS = C			22.7 Sec; LOS = C+			C-

Signal Timing, Secs: Phase 1 = 13.0; Phase 2 = 7.9; Phase 3 = 0.0; Phase 4 = 44.0; Phase 5 = 12.9; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 22.2. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.0; Phase 3 = 20.8; Phase 4 = 20.8; Phase 5 = 64.8; Phase 6 = 77.8; Phase 7 = 77.8; Phase 8 = 77.8.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 1. Stanfield Cutoff (NS) and North Shore (EW)
Time Period: AM Peak Hour Lanes: Existing

Traffic Condition: 2025 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 26 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	0	66	58	0	0	0	24	73	0	56	0	386	663
(2) Number of Lanes, N	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	7.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	61	69	0	0	0	0	25	77	0	465	0	0	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	1900	1900	0	1900	1900	0	1900	1900	0	1900	0	0	
(30) Flow Ratio, v/s = [(28)/(29)]	0.03	0.04	0.00	0.00	0.00	0.00	0.01	0.04	0.00	0.24	0.00	0.00	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.00	0.11	0.00	0.00	0.00	0.00	0.11	0.11	0.00	0.28	0.00	0.00	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	.394
Critical Lane Group = XXXX		XXXX								XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.00	0.28	0.00	0.00	0.00	0.00	0.72	0.72	0.00	0.72	0.00	0.00	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	0.0	27.9	0.0	0.0	0.0	0.0	72.1	72.1	0.0	72.1	0.0	0.0	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	16	0	0	16	0	0	19	0	0	19	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	0	453	0	0	0	0	1295	1295	0	1295	0	0	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.00	0.15	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.36	0.00	0.00	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	50.0	28.3	0.0	50.0	50.0	0.0	4.0	4.2	0.0	6.5	0.0	0.0	12.14
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	100	72	0	100	100	0	28	28	0	28	0	0	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.7	1.4	0.0	0.0	0.0	0.0	0.2	0.6	0.0	3.6	0.0	0.0	0.52
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D-	C	A+	D-	D-	A+	A	A	A+	A	A+	A+	B+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	38.5 Sec; LOS = D+			0.0 Sec; LOS = A+			4.1 Sec; LOS = A			6.5 Sec; LOS = A			B+

Signal Timing, Secs: Phase 1 = 0.0; Phase 2 = 0.0; Phase 3 = 0.0; Phase 4 = 72.1; Phase 5 = 0.0; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 0.0. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 0.0; Phase 3 = 0.0; Phase 4 = 0.0; Phase 5 = 72.1; Phase 6 = 72.1; Phase 7 = 72.1; Phase 8 = 72.1.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 1. Stanfield Cutoff (NS) and North Shore (EW)
Time Period: PM Peak Hour Lanes: Existing

Traffic Condition: 2025 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 34 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	0	166	63	0	0	0	76	83	0	46	0	191	625
(2) Number of Lanes, N	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	7.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	66	175	0	0	0	0	80	87	0	249	0	0	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	1900	1900	0	1900	1900	0	1900	1900	0	1900	0	0	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.09	0.00	0.00	0.00	0.00	0.04	0.05	0.00	0.13	0.00	0.00	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.00	0.13	0.00	0.00	0.00	0.00	0.11	0.11	0.00	0.17	0.00	0.00	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	.303
Critical Lane Group = XXXX		XXXX								XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.00	0.44	0.00	0.00	0.00	0.00	0.56	0.56	0.00	0.56	0.00	0.00	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	0.0	43.5	0.0	0.0	0.0	0.0	56.5	56.5	0.0	56.5	0.0	0.0	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	16	0	0	16	0	0	19	0	0	19	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	0	751	0	0	0	0	997	997	0	997	0	0	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.00	0.23	0.00	0.00	0.00	0.00	0.08	0.09	0.00	0.25	0.00	0.00	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	50.0	18.9	0.0	50.0	50.0	0.0	10.2	10.2	0.0	12.0	0.0	0.0	17.22
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	100	56	0	100	100	0	44	44	0	44	0	0	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.8	2.7	0.0	0.0	0.0	0.0	1.0	1.1	0.0	3.0	0.0	0.0	1.21
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D-	B-	A+	D-	D-	A+	B+	B+	A+	B+	A+	A+	B-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	27.5 Sec; LOS = C			0.0 Sec; LOS = A+			10.2 Sec; LOS = B+			12.0 Sec; LOS = B+			B-

Signal Timing, Secs: Phase 1 = 0.0; Phase 2 = 0.0; Phase 3 = 0.0; Phase 4 = 56.5; Phase 5 = 0.0; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 0.0. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 0.0; Phase 3 = 0.0; Phase 4 = 0.0; Phase 5 = 56.5; Phase 6 = 56.5; Phase 7 = 56.5; Phase 8 = 56.5.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 1. Stanfield Cutoff (NS) and North Shore (EW)
Time Period: AM Peak Hour Lanes: Existing

Traffic Condition: 2025 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 26 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	0	66	71	0	0	0	24	112	0	56	0	386	715
(2) Number of Lanes, N	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	7.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	75	69	0	0	0	0	25	118	0	465	0	0	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	1900	1900	0	1900	1900	0	1900	1900	0	1900	0	0	
(30) Flow Ratio, v/s = [(28)/(29)]	0.04	0.04	0.00	0.00	0.00	0.00	0.01	0.06	0.00	0.24	0.00	0.00	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.00	0.11	0.00	0.00	0.00	0.00	0.11	0.11	0.00	0.28	0.00	0.00	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	.394
Critical Lane Group = XXXX		XXXX								XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.00	0.28	0.00	0.00	0.00	0.00	0.72	0.72	0.00	0.72	0.00	0.00	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	0.0	27.9	0.0	0.0	0.0	0.0	72.1	72.1	0.0	72.1	0.0	0.0	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	16	0	0	16	0	0	19	0	0	19	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	0	453	0	0	0	0	1295	1295	0	1295	0	0	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.00	0.15	0.00	0.00	0.00	0.00	0.02	0.09	0.00	0.36	0.00	0.00	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	50.0	28.3	0.0	50.0	50.0	0.0	4.0	4.4	0.0	6.5	0.0	0.0	12.42
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	100	72	0	100	100	0	28	28	0	28	0	0	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	2.1	1.4	0.0	0.0	0.0	0.0	0.2	0.9	0.0	3.6	0.0	0.0	0.56
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D-	C	A+	D-	D-	A+	A	A	A+	A	A+	A+	B+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	39.6 Sec; LOS = D+			0.0 Sec; LOS = A+			4.3 Sec; LOS = A			6.5 Sec; LOS = A			B+

Signal Timing, Secs: Phase 1 = 0.0; Phase 2 = 0.0; Phase 3 = 0.0; Phase 4 = 72.1; Phase 5 = 0.0; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 0.0. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 0.0; Phase 3 = 0.0; Phase 4 = 0.0; Phase 5 = 72.1; Phase 6 = 72.1; Phase 7 = 72.1; Phase 8 = 72.1.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 1. Stanfield Cutoff (NS) and North Shore (EW)
Time Period: PM Peak Hour Lanes: Existing

Traffic Condition: 2025 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 34 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	0	166	108	0	0	0	76	108	0	46	0	191	695
(2) Number of Lanes, N	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	7.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	114	175	0	0	0	0	80	114	0	249	0	0	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	1900	1900	0	1900	1900	0	1900	1900	0	1900	0	0	
(30) Flow Ratio, v/s = [(28)/(29)]	0.06	0.09	0.00	0.00	0.00	0.00	0.04	0.06	0.00	0.13	0.00	0.00	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.00	0.13	0.00	0.00	0.00	0.00	0.11	0.11	0.00	0.17	0.00	0.00	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	.303
Critical Lane Group = XXXX		XXXX								XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.00	0.44	0.00	0.00	0.00	0.00	0.56	0.56	0.00	0.56	0.00	0.00	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	0.0	43.5	0.0	0.0	0.0	0.0	56.5	56.5	0.0	56.5	0.0	0.0	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	16	0	0	16	0	0	19	0	0	19	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	0	751	0	0	0	0	997	997	0	997	0	0	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.00	0.23	0.00	0.00	0.00	0.00	0.08	0.11	0.00	0.25	0.00	0.00	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	50.0	18.9	0.0	50.0	50.0	0.0	10.2	10.5	0.0	12.0	0.0	0.0	19.13
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	100	56	0	100	100	0	44	44	0	44	0	0	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	3.2	2.7	0.0	0.0	0.0	0.0	1.0	1.4	0.0	3.0	0.0	0.0	1.17
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D-	B-	A+	D-	D-	A+	B+	B+	A+	B+	A+	A+	B-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	31.2 Sec; LOS = C-			0.0 Sec; LOS = A+			10.4 Sec; LOS = B+			12.0 Sec; LOS = B+			B-

Signal Timing, Secs: Phase 1 = 0.0; Phase 2 = 0.0; Phase 3 = 0.0; Phase 4 = 56.5; Phase 5 = 0.0; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 0.0. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 0.0; Phase 3 = 0.0; Phase 4 = 0.0; Phase 5 = 56.5; Phase 6 = 56.5; Phase 7 = 56.5; Phase 8 = 56.5.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing

Traffic Condition: 2025 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 91 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	30	30	33	29	304	15	345	19	115	816	55	31	1822
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	32	32	35	351	0	16	363	20	121	859	58	33	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.18	0.00	0.01	0.19	0.01	0.07	0.45	0.03	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.22	0.00	0.11	0.23	0.11	0.11	0.49	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.22	0.00	0.00	0.00	0.00	0.11	0.49	0.00	0.00	.936
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.23	0.23	0.11	0.23	0.00	0.11	0.54	0.54	0.11	0.54	0.54	0.11	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	23.0	23.0	11.3	23.0	0.0	11.3	54.4	54.4	11.4	54.3	54.3	11.3	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	181	181	131	362	0	131	957	957	132	956	956	131	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.17	0.17	0.26	0.97	0.00	0.12	0.38	0.02	0.91	0.90	0.06	0.25	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.3	34.3	48.4	91.1	0.0	42.9	15.0	10.6	121.7	39.5	11.0	47.7	48.44
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	77	77	89	77	0	89	46	46	89	46	46	89	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.4	1.4	0.9	7.5	0.0	0.4	4.6	0.3	3.0	10.9	0.7	0.8	6.16
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D-	F	A+	D	B	B+	F-	D+	B+	D	D-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	39.3 Sec; LOS = D+			89.0 Sec; LOS = F			40.4 Sec; LOS = D+			38.0 Sec; LOS = D+			D-

Signal Timing, Secs: Phase 1 = 11.3; Phase 2 = 0.1; Phase 3 = 0.0; Phase 4 = 54.3; Phase 5 = 11.3; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 23.0. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 11.3; Phase 3 = 11.4; Phase 4 = 11.4; Phase 5 = 65.7; Phase 6 = 77.0; Phase 7 = 77.0; Phase 8 = 77.0.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing

Traffic Condition: 2025 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 128 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	22	57	48	27	221	26	1123	32	190	564	16	42	2368
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	23	60	51	261	0	27	1182	34	200	594	17	44	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.06	0.03	0.14	0.00	0.02	0.62	0.02	0.11	0.31	0.01	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.18	0.00	0.11	0.66	0.11	0.15	0.35	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.18	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.11	1.05
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.17	0.17	0.09	0.16	0.00	0.09	0.66	0.66	0.14	0.61	0.61	0.09	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.6	16.6	9.0	16.3	0.0	8.7	65.7	65.7	14.1	60.6	60.6	8.9	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	120	120	91	234	0	85	1173	1173	182	1075	1075	89	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.19	0.50	0.56	1.12	0.00	0.32	1.01	0.03	1.10	0.55	0.02	0.50	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	41.7	60.2	78.3	151.6	0.0	58.3	52.6	6.1	157.7	15.0	7.9	72.1	62.55
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	83	83	91	84	0	91	34	34	86	39	39	91	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	2.8	1.3	6.1	0.0	0.7	11.3	0.3	4.8	6.5	0.2	1.1	7.47
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	D	E+	E-	F-	A+	E+	D-	A	F-	B	A-	E-	E+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	63.9 Sec; LOS = E			142.7 Sec; LOS = F-			66.4 Sec; LOS = E			18.7 Sec; LOS = B-			E+

Signal Timing, Secs: Phase 1 = 8.9; Phase 2 = 5.1; Phase 3 = 0.0; Phase 4 = 60.6; Phase 5 = 8.7; Phase 6 = 0.3; Phase 7 = 0.0; Phase 8 = 16.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 8.9; Phase 3 = 14.1; Phase 4 = 14.1; Phase 5 = 74.7; Phase 6 = 83.4; Phase 7 = 83.7; Phase 8 = 83.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW) — Traffic Condition: 2025 Average Month With Project
Time Period: AM Peak Hour — Lanes: Existing — Cycle Length: 100 Seconds — (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 88 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	30	30	33	29	320	38	345	19	120	816	63	31	1874
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	32	32	35	367	0	40	363	20	126	859	66	33	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.19	0.00	0.02	0.19	0.01	0.07	0.45	0.03	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.23	0.00	0.11	0.23	0.11	0.11	0.49	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.23	0.00	0.00	0.00	0.00	0.11	0.49	0.00	0.00	.945
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.24	0.24	0.11	0.24	0.00	0.11	0.54	0.54	0.11	0.54	0.54	0.11	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	23.8	23.8	11.2	23.8	0.0	11.2	53.8	53.8	11.3	53.7	53.7	11.2	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	8	8	5	78	78	57	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	188	188	130	375	0	130	947	947	131	945	945	130	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.17	0.17	0.27	0.98	0.00	0.31	0.38	0.02	0.96	0.91	0.07	0.25	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	33.4	33.4	48.7	91.8	0.0	50.6	15.3	10.8	134.2	41.5	11.4	48.0	50.81
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	76	76	89	76	0	89	46	46	89	46	46	89	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.3	1.3	0.9	7.8	0.0	1.0	4.7	0.3	3.1	11.0	0.9	0.8	6.10
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	D-	F	A+	D-	B	B+	F-	D+	B+	D	D-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	38.8 Sec; LOS = D+			87.8 Sec; LOS = F			44.6 Sec; LOS = D			39.6 Sec; LOS = D+			D-

Signal Timing, Secs: Phase 1 = 11.2; Phase 2 = 0.1; Phase 3 = 0.0; Phase 4 = 53.7; Phase 5 = 11.2; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 23.8. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 11.2; Phase 3 = 11.3; Phase 4 = 11.3; Phase 5 = 65.0; Phase 6 = 76.2; Phase 7 = 76.2; Phase 8 = 76.2.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing
Traffic Condition: 2025 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 127 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	22	57	48	27	231	41	1123	32	208	564	43	42	2438
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	23	60	51	272	0	43	1182	34	219	594	45	44	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.06	0.03	0.14	0.00	0.02	0.62	0.02	0.12	0.31	0.02	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.18	0.00	0.11	0.66	0.11	0.16	0.35	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.18	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.11	1.06
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.17	0.17	0.09	0.16	0.00	0.09	0.66	0.66	0.15	0.59	0.59	0.09	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.5	16.5	9.0	16.4	0.0	8.9	65.6	65.6	15.1	59.4	59.4	9.0	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	119	119	91	236	0	89	1170	1170	200	1053	1053	89	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.19	0.50	0.56	1.15	0.00	0.48	1.01	0.03	1.09	0.56	0.04	0.49	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	41.8	60.7	78.1	162.3	0.0	70.9	53.4	6.1	150.9	15.9	8.6	71.9	64.33
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	83	83	91	84	0	91	34	34	85	41	41	91	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.1	2.8	1.3	6.3	0.0	1.1	11.3	0.3	5.2	6.7	0.5	1.1	7.42
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	D	E+	E-	F-	A+	E	D-	A	F-	B	A-	E-	E
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	64.0 Sec; LOS = E			149.8 Sec; LOS = F-			67.2 Sec; LOS = E			19.1 Sec; LOS = B-			E

Signal Timing, Secs: Phase 1 = 9.0; Phase 2 = 6.2; Phase 3 = 0.0; Phase 4 = 59.4; Phase 5 = 8.9; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 16.4. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 9.0; Phase 3 = 15.1; Phase 4 = 15.1; Phase 5 = 74.5; Phase 6 = 83.5; Phase 7 = 83.6; Phase 8 = 83.6.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped
Traffic Condition: 2025 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 76 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	30	30	33	29	304	15	345	19	115	816	55	31	1822
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	32	32	35	351	0	16	383	0	121	917	0	33	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.18	0.00	0.01	0.10	0.00	0.07	0.24	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.22	0.00	0.11	0.14	0.00	0.11	0.28	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.22	0.00	0.00	0.00	0.00	0.11	0.28	0.00	0.00	.725
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.28	0.28	0.14	0.28	0.00	0.13	0.45	0.00	0.14	0.45	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	27.6	27.6	13.5	27.6	0.0	13.5	45.4	0.0	13.7	45.2	0.0	13.5	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	224	224	171	448	0	171	1574	0	175	1567	0	171	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.14	0.14	0.20	0.78	0.00	0.09	0.24	0.00	0.69	0.59	0.00	0.19	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	29.4	29.4	42.7	53.1	0.0	39.6	17.3	0.0	72.0	23.0	0.0	42.4	31.50
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	72	72	86	72	0	87	55	0	86	55	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.3	1.3	0.8	7.1	0.0	0.4	2.9	0.0	2.9	7.0	0.0	0.8	4.04
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C	C	D	D-	A+	D+	B-	A+	E-	C+	A+	D	C-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	34.2 Sec; LOS = C-			52.5 Sec; LOS = D-			30.5 Sec; LOS = C-			23.7 Sec; LOS = C+			C-

Signal Timing, Secs: Phase 1 = 13.5; Phase 2 = 0.2; Phase 3 = 0.0; Phase 4 = 45.2; Phase 5 = 13.5; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 27.6. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.5; Phase 3 = 13.7; Phase 4 = 13.7; Phase 5 = 58.9; Phase 6 = 72.4; Phase 7 = 72.4; Phase 8 = 72.4.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped
Traffic Condition: 2025 Average Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 106 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	22	57	48	27	221	26	1123	32	190	564	16	42	2368
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	23	60	51	261	0	27	1216	0	200	611	0	44	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.06	0.03	0.14	0.00	0.02	0.32	0.00	0.11	0.16	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.18	0.00	0.11	0.36	0.00	0.15	0.20	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.18	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.11	.757
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.20	0.20	0.13	0.20	0.00	0.12	0.55	0.00	0.19	0.48	0.00	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	20.1	20.1	12.7	19.7	0.0	12.4	55.0	0.0	19.2	48.4	0.0	12.6	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	152	152	156	299	0	151	1937	0	273	1688	0	155	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.15	0.39	0.32	0.87	0.00	0.18	0.63	0.00	0.73	0.36	0.00	0.29	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	36.4	46.6	48.5	78.5	0.0	43.5	18.0	0.0	62.5	17.1	0.0	47.0	29.95
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	80	80	87	80	0	88	45	0	81	52	0	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.0	2.7	1.2	5.8	0.0	0.7	7.6	0.0	4.5	4.4	0.0	1.1	5.20
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D	D-	E-	A+	D	B-	A+	E+	B-	A+	D	C
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	45.5 Sec; LOS = D			75.2 Sec; LOS = E-			24.3 Sec; LOS = C+			19.1 Sec; LOS = B-			C

Signal Timing, Secs: Phase 1 = 12.6; Phase 2 = 6.6; Phase 3 = 0.0; Phase 4 = 48.4; Phase 5 = 12.4; Phase 6 = 0.3; Phase 7 = 0.0; Phase 8 = 19.7. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 12.6; Phase 3 = 19.2; Phase 4 = 19.2; Phase 5 = 67.6; Phase 6 = 79.9; Phase 7 = 80.3; Phase 8 = 80.3.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped
Traffic Condition: 2025 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 72 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	30	30	33	29	320	38	345	19	120	816	63	31	1874
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	32	32	35	367	0	40	383	0	126	925	0	33	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.03	0.02	0.19	0.00	0.02	0.10	0.00	0.07	0.24	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.23	0.00	0.11	0.14	0.00	0.11	0.28	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.23	0.00	0.00	0.00	0.00	0.11	0.28	0.00	0.00	.737
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.29	0.29	0.14	0.29	0.00	0.14	0.44	0.00	0.15	0.43	0.00	0.14	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	28.8	28.8	13.8	28.9	0.0	13.9	43.5	0.0	14.7	42.6	0.0	13.8	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	8	8	5	78	78	57	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	236	236	177	473	0	177	1501	0	192	1468	0	176	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.13	0.13	0.20	0.78	0.00	0.23	0.26	0.00	0.66	0.63	0.00	0.19	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	28.2	28.2	42.2	50.8	0.0	43.0	18.6	0.0	65.5	25.8	0.0	41.9	32.60
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	71	71	86	71	0	86	56	0	85	57	0	86	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.2	1.2	0.8	7.3	0.0	1.0	3.0	0.0	3.0	7.4	0.0	0.8	4.15
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C	C	D	D-	A+	D	B-	A+	E	C	A+	D	C-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	33.2 Sec; LOS = C-			50.0 Sec; LOS = D-			30.2 Sec; LOS = C-			26.4 Sec; LOS = C			C-

Signal Timing, Secs: Phase 1 = 13.8; Phase 2 = 0.9; Phase 3 = 0.0; Phase 4 = 42.6; Phase 5 = 13.8; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 28.8. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 13.8; Phase 3 = 14.7; Phase 4 = 14.7; Phase 5 = 57.3; Phase 6 = 71.1; Phase 7 = 71.1; Phase 8 = 71.2.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped
Traffic Condition: 2025 Average Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 103 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	22	57	48	27	231	41	1123	32	208	564	43	42	2438
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	23	60	51	272	0	43	1216	0	219	639	0	44	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.02	0.06	0.03	0.14	0.00	0.02	0.32	0.00	0.12	0.17	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.18	0.00	0.11	0.36	0.00	0.16	0.21	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.18	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.11	.762
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.20	0.20	0.13	0.20	0.00	0.13	0.55	0.00	0.20	0.47	0.00	0.13	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	20.4	20.4	12.6	20.3	0.0	12.5	54.5	0.0	20.4	46.6	0.0	12.6	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	156	156	155	310	0	154	1920	0	296	1620	0	154	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.15	0.39	0.33	0.88	0.00	0.28	0.63	0.00	0.74	0.39	0.00	0.29	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	35.9	45.7	48.6	78.1	0.0	46.9	18.4	0.0	60.7	18.6	0.0	47.1	30.74
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	80	80	87	80	0	87	45	0	80	53	0	87	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.0	2.7	1.2	6.0	0.0	1.0	7.7	0.0	4.8	4.7	0.0	1.1	5.24
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D	D-	E-	A+	D	B-	A+	E+	B-	A+	D	C-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	45.1 Sec; LOS = D			73.8 Sec; LOS = E-			24.8 Sec; LOS = C+			20.5 Sec; LOS = C+			C-

Signal Timing, Secs: Phase 1 = 12.6; Phase 2 = 7.9; Phase 3 = 0.0; Phase 4 = 46.6; Phase 5 = 12.5; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 20.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 12.6; Phase 3 = 20.4; Phase 4 = 20.4; Phase 5 = 67.1; Phase 6 = 79.6; Phase 7 = 79.7; Phase 8 = 79.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing
Traffic Condition: 2025 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 89 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	37	37	42	36	380	19	431	23	144	1020	68	39	2276
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	39	39	44	438	0	20	454	24	152	1074	72	41	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.04	0.04	0.02	0.23	0.00	0.01	0.24	0.01	0.08	0.57	0.04	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.27	0.00	0.11	0.28	0.11	0.12	0.61	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.27	0.00	0.00	0.00	0.00	0.12	0.61	0.00	0.00	1.10
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.23	0.23	0.10	0.23	0.00	0.10	0.58	0.58	0.11	0.56	0.56	0.10	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	23.4	23.4	9.5	23.4	0.0	9.5	57.5	57.5	10.8	56.2	56.2	9.5	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	184	184	99	369	0	99	1017	1017	123	992	992	99	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.21	0.21	0.44	1.19	0.00	0.20	0.45	0.02	1.23	1.08	0.07	0.41	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	35.0	35.0	64.4	157.9	0.0	49.0	14.4	9.2	223.5	82.4	10.2	61.9	86.87
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	77	77	90	77	0	90	42	42	89	44	44	90	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.7	1.7	1.1	9.3	0.0	0.5	5.4	0.3	3.8	13.1	0.9	1.0	7.37
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	D+	D+	E	F-	A+	D-	B	A-	F-	F+	B+	E+	F+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	45.7 Sec; LOS = D			153.1 Sec; LOS = F-			64.6 Sec; LOS = E			77.4 Sec; LOS = E-			F+

Signal Timing, Secs: Phase 1 = 9.5; Phase 2 = 1.3; Phase 3 = 0.0; Phase 4 = 56.2; Phase 5 = 9.5; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 23.4. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 9.5; Phase 3 = 10.8; Phase 4 = 10.8; Phase 5 = 67.1; Phase 6 = 76.6; Phase 7 = 76.6; Phase 8 = 76.6.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing
Traffic Condition: 2025 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 128 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	28	71	60	34	276	33	1404	40	237	705	20	53	2961
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	29	75	63	326	0	35	1478	42	249	742	21	56	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.08	0.04	0.17	0.00	0.02	0.78	0.02	0.14	0.39	0.01	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.12	0.12	0.11	0.21	0.00	0.11	0.82	0.11	0.18	0.43	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.21	0.00	0.00	0.82	0.00	0.00	0.00	0.00	0.11	1.24
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.17	0.17	0.08	0.16	0.00	0.07	0.68	0.68	0.14	0.62	0.62	0.08	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.6	16.6	7.8	16.3	0.0	7.5	68.2	68.2	14.1	61.8	61.8	7.7	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	120	120	68	234	0	63	1220	1220	182	1098	1098	66	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.25	0.62	0.93	1.39	0.00	0.56	1.21	0.03	1.37	0.68	0.02	0.84	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	44.0	72.4	165.7	255.1	0.0	92.0	123.2	5.3	254.9	17.9	7.4	143.4	119.03
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	83	83	92	84	0	93	32	32	86	38	38	92	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.4	3.5	1.6	7.6	0.0	0.9	13.1	0.4	5.9	7.9	0.2	1.4	8.80
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	D	E-	F-	F-	A+	F	F-	A	F-	B-	A-	F-	F-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	102.6 Sec; LOS = F-			239.4 Sec; LOS = F-			139.0 Sec; LOS = F-			26.2 Sec; LOS = C			F-

Signal Timing, Secs: Phase 1 = 7.7; Phase 2 = 6.4; Phase 3 = 0.0; Phase 4 = 61.8; Phase 5 = 7.5; Phase 6 = 0.3; Phase 7 = 0.0; Phase 8 = 16.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 7.7; Phase 3 = 14.1; Phase 4 = 14.1; Phase 5 = 75.9; Phase 6 = 83.4; Phase 7 = 83.7; Phase 8 = 83.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Existing

Traffic Condition: 2025 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 87 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	37	37	42	36	396	42	431	23	149	1020	76	39	2328
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	39	39	44	455	0	44	454	24	157	1074	80	41	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.04	0.04	0.02	0.24	0.00	0.02	0.24	0.01	0.09	0.57	0.04	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.28	0.00	0.11	0.28	0.11	0.13	0.61	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.28	0.00	0.00	0.00	0.00	0.13	0.61	0.00	0.00	1.12
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.24	0.24	0.09	0.24	0.00	0.09	0.57	0.57	0.11	0.56	0.56	0.09	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	24.0	24.0	9.4	24.0	0.0	9.4	57.1	57.1	11.0	55.6	55.6	9.4	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	190	190	98	379	0	98	1010	1010	126	980	980	98	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.21	0.21	0.45	1.20	0.00	0.45	0.45	0.02	1.25	1.10	0.08	0.42	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.3	34.3	65.3	161.2	0.0	65.3	14.7	9.4	227.3	87.5	10.6	62.7	90.44
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	76	76	91	76	0	91	43	43	89	44	44	91	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.6	1.6	1.1	9.6	0.0	1.1	5.4	0.3	3.9	13.2	1.0	1.0	7.34
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	C-	E	F-	A+	E	B	A-	F-	F+	B+	E+	F
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	45.6 Sec; LOS = D			152.7 Sec; LOS = F-			67.0 Sec; LOS = E			81.5 Sec; LOS = F+			F

Signal Timing, Secs: Phase 1 = 9.4; Phase 2 = 1.5; Phase 3 = 0.0; Phase 4 = 55.6; Phase 5 = 9.4; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 24.0. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 9.4; Phase 3 = 11.0; Phase 4 = 11.0; Phase 5 = 66.6; Phase 6 = 76.0; Phase 7 = 76.0; Phase 8 = 76.0.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Existing

Traffic Condition: 2025 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 127 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	28	71	60	34	286	48	1404	40	255	705	47	53	3031
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	29	75	63	337	0	51	1478	42	268	742	49	56	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	1900	1900	1800	1900	1900	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.08	0.04	0.18	0.00	0.03	0.78	0.02	0.15	0.39	0.03	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.12	0.12	0.11	0.22	0.00	0.11	0.82	0.11	0.19	0.43	0.11	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.22	0.00	0.00	0.82	0.00	0.00	0.00	0.00	0.11	1.25
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.17	0.17	0.08	0.16	0.00	0.08	0.68	0.68	0.15	0.61	0.61	0.08	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	16.6	16.6	7.8	16.4	0.0	7.6	68.1	68.1	15.0	60.8	60.8	7.7	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	119	119	68	236	0	66	1218	1218	198	1079	1079	67	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.25	0.63	0.93	1.43	0.00	0.77	1.21	0.03	1.36	0.69	0.05	0.84	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	44.1	72.9	165.1	268.2	0.0	128.2	124.2	5.3	246.8	18.9	8.0	142.8	121.15
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	83	83	92	84	0	92	32	32	85	39	39	92	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.4	3.5	1.6	7.8	0.0	1.3	13.1	0.4	6.3	8.1	0.5	1.4	8.75
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES	NO
(43) Level of Service (LOS) Based on (39) [See Note 4]	D	E-	F-	F-	A+	F-	F-	A	F-	B-	A-	F-	F-
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	102.7 Sec; LOS = F-			250.0 Sec; LOS = F-			139.8 Sec; LOS = F-			26.5 Sec; LOS = C			F-

Signal Timing, Secs: Phase 1 = 7.7; Phase 2 = 7.3; Phase 3 = 0.0; Phase 4 = 60.8; Phase 5 = 7.6; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 16.4. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 7.7; Phase 3 = 15.0; Phase 4 = 15.0; Phase 5 = 75.8; Phase 6 = 83.4; Phase 7 = 83.6; Phase 8 = 83.6.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped
Traffic Condition: 2025 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 68 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	37	37	42	36	380	19	431	23	144	1020	68	39	2276
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; AROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	39	39	44	438	0	20	478	0	152	1145	0	41	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.04	0.04	0.02	0.23	0.00	0.01	0.13	0.00	0.08	0.30	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.27	0.00	0.11	0.17	0.00	0.12	0.34	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.27	0.00	0.00	0.00	0.00	0.12	0.34	0.00	0.00	.846
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.31	0.31	0.12	0.31	0.00	0.12	0.44	0.00	0.14	0.43	0.00	0.12	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	30.7	30.7	12.5	30.7	0.0	12.5	44.3	0.0	14.2	42.6	0.0	12.5	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	254	254	153	508	0	153	1531	0	183	1467	0	153	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.15	0.15	0.29	0.86	0.00	0.13	0.31	0.00	0.83	0.78	0.00	0.27	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	27.3	27.3	47.3	58.3	0.0	41.8	18.9	0.0	89.2	31.3	0.0	46.5	37.93
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	69	69	88	69	0	88	56	0	86	57	0	88	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.5	1.5	1.1	8.4	0.0	0.5	3.7	0.0	3.6	9.1	0.0	1.0	5.24
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C	C	D	E+	A+	D	B-	A+	F	C-	A+	D	D+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	34.5 Sec; LOS = C-			57.6 Sec; LOS = E+			35.8 Sec; LOS = D+			31.8 Sec; LOS = C-			D+

Signal Timing, Secs: Phase 1 = 12.5; Phase 2 = 1.7; Phase 3 = 0.0; Phase 4 = 42.6; Phase 5 = 12.5; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 30.7. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 12.5; Phase 3 = 14.2; Phase 4 = 14.2; Phase 5 = 56.8; Phase 6 = 69.3; Phase 7 = 69.3; Phase 8 = 69.3.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped
Traffic Condition: 2025 Peak Month Without Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 94 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	28	71	60	34	276	33	1404	40	237	705	20	53	2961
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	29	75	63	326	0	35	1520	0	249	763	0	56	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.08	0.04	0.17	0.00	0.02	0.40	0.00	0.14	0.20	0.00	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.12	0.12	0.11	0.21	0.00	0.11	0.44	0.00	0.18	0.24	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.21	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.11	.871
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.22	0.22	0.12	0.22	0.00	0.12	0.54	0.00	0.20	0.46	0.00	0.12	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	22.4	22.4	11.8	22.2	0.0	11.6	54.3	0.0	20.0	46.0	0.0	11.7	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	174	174	140	346	0	137	1910	0	288	1597	0	139	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.17	0.43	0.45	0.94	0.00	0.25	0.80	0.00	0.87	0.48	0.00	0.40	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.7	45.3	57.1	86.9	0.0	47.3	24.0	0.0	78.4	20.3	0.0	54.2	36.15
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	78	78	88	78	0	88	46	0	80	54	0	88	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.3	3.2	1.5	7.1	0.0	0.9	9.7	0.0	5.5	5.7	0.0	1.4	6.62
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	D	E+	F+	A+	D	C+	A+	E-	C+	A+	D-	D+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	47.9 Sec; LOS = D			83.1 Sec; LOS = F+			31.7 Sec; LOS = C-			22.6 Sec; LOS = C+			D+

Signal Timing, Secs: Phase 1 = 11.7; Phase 2 = 8.2; Phase 3 = 0.0; Phase 4 = 46.0; Phase 5 = 11.6; Phase 6 = 0.2; Phase 7 = 0.0; Phase 8 = 22.2. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 11.7; Phase 3 = 20.0; Phase 4 = 20.0; Phase 5 = 66.0; Phase 6 = 77.6; Phase 7 = 77.8; Phase 8 = 77.8.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: AM Peak Hour Lanes: Restriped

Traffic Condition: 2025 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 67 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	37	37	42	36	396	42	431	23	149	1020	76	39	2328
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	39	39	44	455	0	44	478	0	157	1154	0	41	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.04	0.04	0.02	0.24	0.00	0.02	0.13	0.00	0.09	0.30	0.00	0.02	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.11	0.11	0.11	0.28	0.00	0.11	0.17	0.00	0.13	0.34	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.28	0.00	0.00	0.00	0.00	0.13	0.34	0.00	0.00	.860
Critical Lane Group = XXXX			XXXX	XXXX					XXXX	XXXX			
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.31	0.31	0.12	0.31	0.00	0.12	0.44	0.00	0.14	0.42	0.00	0.12	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	31.3	31.3	12.3	31.3	0.0	12.3	44.1	0.0	14.3	42.1	0.0	12.3	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed + 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	259	259	150	518	0	150	1525	0	185	1449	0	150	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.15	0.15	0.30	0.88	0.00	0.30	0.31	0.00	0.85	0.80	0.00	0.27	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	26.8	26.8	47.9	59.8	0.0	47.9	19.0	0.0	92.0	32.5	0.0	47.0	39.35
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	69	69	88	69	0	88	56	0	86	58	0	88	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.5	1.5	1.1	8.7	0.0	1.1	3.7	0.0	3.7	9.3	0.0	1.0	5.23
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C	C	D	E+	A+	D	B-	A+	F	C-	A+	D	D+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	34.4 Sec; LOS = C-			58.7 Sec; LOS = E+			37.0 Sec; LOS = D+			33.0 Sec; LOS = C-			D+

Signal Timing, Secs: Phase 1 = 12.3; Phase 2 = 2.0; Phase 3 = 0.0; Phase 4 = 42.1; Phase 5 = 12.3; Phase 6 = 0.0; Phase 7 = 0.0; Phase 8 = 31.3. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 12.3; Phase 3 = 14.3; Phase 4 = 14.3; Phase 5 = 56.4; Phase 6 = 68.7; Phase 7 = 68.7; Phase 8 = 68.7.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

INTERSECTION DELAY CALCULATION USING 1997 HIGHWAY CAPACITY MANUAL PROCEDURE

Intersection: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
Time Period: PM Peak Hour Lanes: Restriped
Traffic Condition: 2025 Peak Month With Project
Cycle Length: 100 Seconds (Maximum Cycle Length Needed to Satisfy Pedestrians When Present: 92 Seconds)

Descriptor	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL	Total
INPUT DATA													
(1) Volume per Hour, V	28	71	60	34	286	48	1404	40	255	705	47	53	3031
(2) Number of Lanes, N	0.50	0.50	1.00	1.00	0.00	1.00	2.00	0.00	1.00	2.00	0.00	1.00	10.00
(3) Right Turns (FREE=Free Right Turn Lane; ARROW=Right Turn Arrow) [See Note 5]													
(4) Lost Time (Yellow, All Red, Etc) in Seconds, Y (Typically 2 to 4 Seconds) [See Note 9]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
(5) Peak Hour Factor, PHF (1.00 for Peak Hour; 0.90 or 0.95 for Peak 15 Minutes)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
(6) Lane Width (8; 9; 10; 11; 12 [Factor = 1.00]; 13; 14; 15; or 16 for 15+)	12	12	12	12	12	12	12	12	12	12	12	12	
(7) Percent Heavy Vehicles (0; 2; 4; 6; 8; 10; 15; 20; 25; or 30; Typically 4 or 6)	0	0	0	0	0	0	0	0	0	0	0	0	
(8) Grade (-6; -4; -2; 0; +2; +4; or +6)	0	0	0	0	0	0	0	0	0	0	0	0	
(9) Parking Maneuvers per Hour (-1 = No Parking [Factor = 1.00]; 0; 10; 20; 30; or 40)	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
(10) Buses Stopping per Hour (0; 10; 20; 30; or 40)	0	0	0	0	0	0	0	0	0	0	0	0	
(11) CBD/Other (0=CBD; 1=Other)	1	1	1	1	1	1	1	1	1	1	1	1	
(12) Right Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/ Shared Lane)	0	0	0	0	0	0	0	0	0	0	0	0	
(13) Pedestrians per Hour Conflicting with Right Turns (0; 50; 100; 200; 300; 400; or 500)	0	0	0	0	0	0	0	0	0	0	0	0	
(14) Left Turn Lane Type (0=Standard [Factor=1.00]; 1=Unprotected; 2=Protected w/Separate Arrow)	0	0	0	0	0	0	0	0	0	0	0	0	
(15) Saturated Flow Rate per Hour of Green Time (HCM Recommends 1900)	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	
(16) Signal Progression (1=PreTimed/Factor=1.0; 2=Actuated/Factor=0.85; 3=Actuated & Progressed)	1	1	1	1	1	1	1	1	1	1	1	1	
(17) Minimum Green Time in Seconds (Usually 7 to 10 seconds)	7	7	7	7	7	7	7	7	7	7	7	7	
FACTORS FROM TABLES													
(18) Lane Utilization Factor [Table 9-4]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(19) Lane Width Factor [Table 9-5]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(20) Heavy Vehicles Factor [Table 9-6]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(21) Grade Factor [Table 9-7]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(22) Parking Maneuvers Factor [Table 9-8]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(23) Busses Stopping Fcator [Table 9-9]	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
(24) CBD/Other Factor [Table 9-10]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(25) Right Turn Lane Factor [Table 9-11]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(26) Left Turn Lane factor [Table 9-12]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27) Progression Adjustment Factor [Table 9-13]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(27a) Progression k Value [Table 9-14]	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
CALCULATED VALUES AND PERFORMANCE MEASURES													
(28) Adjusted Flow Rate (in Peak 15 Minutes) in Vehicles per Hour, v = [(1)*(18)/(5)]	29	75	63	337	0	51	1520	0	268	792	0	56	
(29) Adjusted Saturation Flow Rate in Vehicles per Hour of Green, s = [See Note 1]	950	950	1800	1900	0	1800	3800	0	1800	3800	0	1800	
(30) Flow Ratio, v/s = [(28)/(29)].	0.03	0.08	0.04	0.18	0.00	0.03	0.40	0.00	0.15	0.21	0.00	0.03	
(31) Minimum Green Plus Lost Time as Proportion of Cycle [See Note 7]	0.12	0.12	0.11	0.22	0.00	0.11	0.44	0.00	0.19	0.25	0.00	0.11	
(32) Critical Lane Group = [(31)'s That Are Critical]. Total is ICU. [See Note 10]	0.00	0.00	0.11	0.22	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.11	.877
Critical Lane Group = XXXX			XXXX	XXXX			XXXX					XXXX	
(33) Green Time Allocated as Proportion of Cycle, g/C=[See Note 2]. Sum of Critical Moves = 1.00	0.23	0.23	0.12	0.23	0.00	0.12	0.54	0.00	0.21	0.45	0.00	0.12	
(34) Green Time Allocated in Seconds, [(33) * Cycle Length]	22.7	22.7	11.7	22.7	0.0	11.7	53.9	0.0	21.1	44.5	0.0	11.7	
(35) Minimum Ped Time Needed to Cross Street [3 Seconds per Lane Crossed ÷ 7 Seconds]	21	0	0	21	0	0	15	0	0	15	0	0	
(36) Signal Phases Available to Movement. 1 = Phase 1; 13 = Phases 1 and 3. [See Note 6]	68	68	56	8	8	5	24	24	12	4	4	1	
(37) Capacity in Vehicles per Hour (includes Yellow Penalty adjustment), c=[((33)-(4)/C)*(29)]	178	178	139	355	0	138	1896	0	307	1539	0	138	
(38) Volume to Capacity Ratio, v/c = X = [(28)/(37)]	0.17	0.42	0.45	0.95	0.00	0.37	0.80	0.00	0.87	0.51	0.00	0.40	
(39) Average Delay per Vehicle in Seconds, d [See Note 3]	34.2	44.4	57.5	87.2	0.0	52.5	24.6	0.0	77.1	22.0	0.0	54.5	37.11
(40) Percent of Vehicles That Have to Stop [1.00 -(33)]	77	77	88	77	0	88	46	0	79	55	0	88	
(41) Average Vehicle Queue Length at Beginning of Green, [(28)/(2) * Cycle Length/3600 * (40)]	1.3	3.2	1.5	7.2	0.0	1.2	9.7	0.0	5.9	6.1	0.0	1.4	6.66
(42) Do All Vehicles Clear? [YES if (38) < 0.95] [See Note 8]	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(43) Level of Service (LOS) Based on (39) [See Note 4]	C-	D	E+	F+	A+	D-	C+	A+	E-	C+	A+	D-	D+
(44) Leg Average Delay per Vehicle in Seconds - Level of Service, LOS	47.5 Sec; LOS = D			82.6 Sec; LOS = F+			32.4 Sec; LOS = C-			24.1 Sec; LOS = C+			D+

Signal Timing, Secs: Phase 1 = 11.7; Phase 2 = 9.4; Phase 3 = 0.0; Phase 4 = 44.5; Phase 5 = 11.7; Phase 6 = 0.1; Phase 7 = 0.0; Phase 8 = 22.7. If time = 0.0, Phase is skipped.
Signal Offsets, Secs: Phase 1 = 0.0; Phase 2 = 11.7; Phase 3 = 21.1; Phase 4 = 21.1; Phase 5 = 65.6; Phase 6 = 77.3; Phase 7 = 77.3; Phase 8 = 77.3.
See Notes on last page. NT = Northbound Through, NR = Northbound Right, NL = Northbound Left, ST = Southbound Through, ... , WL = Westbound Left

1997 HIGHWAY CAPACITY MANUAL DELAY METHOD NOTES

NOTES

Note 1: Adjusted Saturation Flow Rate, s = [(15)*(2)*(19)*(20)*(21)*(22)*(23)*(24)*(25)*(26)]

Note 2: Green Time Allocation, g/C = [(31)/Sum of Criticals from (32)], approximately

Note 3: Delay per Vehicle, d = [0.50 * C * [(1-(33))*(1-(33))]/(1-(33)*(38))*(27)] + [173 * (38)*(38) * (((38)-1) + [((((38)-1)*((38)-1)) + (8*k*1*(38)/((37)*.25)))^.5])]
OR Delay per Vehicle, d = [0.50 * C * [(1-g/C)*(1-g/C)]/(1-g/C*X)*(PF)] + [900*.25*X*X * ((X-1) + [(((X-1)*(X-1)) + (8*k*1*X/(c*.25)))^.5])]
Where: C = Cycle Length; g = green time in seconds; v = volume per hour; c = capacity in vehicles per hour; X = v/c = volume to capacity ratio; k = k value; and PF = Progression Factor.

Note 4 = Level of Service Definition

0 to 10	Seconds of Delay per Vehicle = Level of Service A	(A+ = 0- 3.3 seconds;	A = 3.4- 6.7 seconds;	A- = 6.8-10.0 seconds)
10.1 to 20	Seconds of Delay per Vehicle = Level of Service B	(B+ = 10.1-13.3 seconds;	B = 13.4-16.7 seconds;	B- = 16.8-20.0 seconds)
20.1 to 35	Seconds of Delay per Vehicle = Level of Service C	(C+ = 20.1-25.0 seconds;	C = 25.1-30.0 seconds;	C- = 30.1-35.0 seconds)
35.1 to 55	Seconds of Delay per Vehicle = Level of Service D	(D+ = 35.1-41.7 seconds;	D = 41.8-48.3 seconds;	D- = 48.4-55.0 seconds)
55.1 to 80	Seconds of Delay per Vehicle = Level of Service E	(E+ = 55.1-63.3 seconds;	E = 63.4-71.7 seconds;	E- = 71.8-80.0 seconds)
80.1 and up	Seconds of Delay per Vehicle = Level of Service F	(F+ = 80.1-88.3 seconds;	F = 88.4-96.7 seconds;	F- = 96.7 seconds and up)

Note 5 = Right Turn Arrow
It has been assumed that a right turn arrow is on during the time that the overlapping left turns occur. Overlapping left turns are as follows:
For northbound right, the overlapping left turn is westbound left. For southbound right, the overlapping left turn is eastbound left.
For eastbound right, the overlapping left turn is northbound left. For westbound right, the overlapping left turn is southbound left.

Note 6 = Signal Phases are numbered as follows:

Phase	NR					SR					ER					WR				
	NT	Std	Free	Arrow	NL	ST	Std	Free	Arrow	SL	ET	Std	Free	Arrow	EL	WT	Std	Free	Arrow	WL
Phase 1: EL and WL	.	.	*	*	.	.	.	*	*	.	.	.	*	.	*	.	.	*	.	*
Phase 2: EL and ET and ER (If EL green > WL green)	.	.	*	.	.	.	.	*	*	.	*	*	*	*	*	.	.	*	.	.
Phase 3: WL and WT and WR (If WL green > EL green)	.	.	*	*	.	.	.	*	.	.	.	.	*	.	.	*	*	*	*	*
Phase 4: ET and ER and WT and WR	.	.	*	.	.	.	.	*	.	.	*	*	*	*	.	*	*	*	*	.
Phase 5: NL and SL	.	.	*	.	*	.	.	*	.	*	.	.	*	*	.	.	.	*	*	.
Phase 6: NL and NT and NR (If NL green > SL green)	*	*	*	*	*	.	.	*	.	.	.	.	*	*	.	.	.	*	.	.
Phase 7: SL and ST and SR (If SL green > NL green)	.	.	*	.	.	*	*	*	*	*	.	.	*	.	.	.	.	*	*	.
Phase 8: NT and NR and ST and SR	*	*	*	*	.	*	*	*	*	.	.	.	*	.	.	.	.	*	.	.

Phase order is 1, 2, 3, 4, 5, 6, 7, and 8. Some phases will be skipped. Phases 2 and 3 will never both be used, and phases 6 and 7 will never both be used. Either Phase 2 or 3 will be used, and either Phase 6 or 7 will be used. An 8 phase controller is assumed. If less than 8 phases are needed such as at a Tee intersection, the 8 phase controller is still assumed except that several phases will be skipped.

Note 7 = The Minimum Green Times always meet the following criteria: Larger of (30) + (4) / Cycle, or ((7) + (4)) / Cycle. It also always meets any requirements for right turning vehicles to have enough green time for pedestrians to clear. If possible, it also meets the amount of time needed for pedestrians to walk across the street. If the 'Maximum Cycle Length Needed to Satisfy Pedestrians When Present' is less than the Cycle Length, then that criteria has also been met.

Note 8 = Use of a v/c ratio of 0.95 to determine whether a movement clears is an arbitrary assumption. If an intersection has a v/c ratio of 0.95, its volume could randomly fluctuate by more than 5 percent and the vehicles would still clear. If one movement's random fluctuation was greater than 5 percent, and all other intersection movements were average, the green times would adjust and the intersection would still clear. Using a v/c of 0.95 to estimate whether an intersection clears will be valid a high percentage of the time.

Note 9 = Lost Time in seconds includes unused part of yellow time, all red time, and start up time less extension of effective green time.

Note 10 = ICU is the sum of the critical moves in (32). ICU LOS's are as follows: 0-0.600=LOS A, 0.601-0.700=LOS B, 0.701-0.800=LOS C, 0.801-0.900=LOS D, 0.901-1.000=LOS E, 1.001+=LOS F.

ABBREVIATIONS: NT = Northbound Through; NR = Northbound Right; NL = Northbound Left; ST = Southbound Through; SR = Southbound Right; SL = Southbound Left
ET = Eastbound Through; ER = Eastbound Right; EL = Eastbound Left; WT = Westbound Through; WR = Westbound Right; WL = Westbound Left

( ) = Variable Number. This number corresponds to the variable number as identified in intersection delay calculation tables.

1997 HIGHWAY CAPACITY MANUAL DELAY METHOD NOTES

NOTES

Note 1: Adjusted Saturation Flow Rate, s = [(15)*(2)*(19)*(20)*(21)*(22)*(23)*(24)*(25)*(26)]

Note 2: Green Time Allocation, g/C = [(31)/Sum of Criticals from (32)], approximately

Note 3: Delay per Vehicle, d = [0.50 * C * [(1-(33))*(1-(33))]/(1-(33)*(38))*(27)] + [173 * (38)*(38) * (((38)-1) + [((((38)-1)*((38)-1)) + (8*k*1*(38)/((37)*.25)))^.5])]
OR Delay per Vehicle, d = [0.50 * C * [(1-g/C)*(1-g/C)]/(1-g/C*X)*(PF)] + [900*.25*X*X * ((X-1) + [(((X-1)*(X-1)) + (8*k*1*X/(c*.25)))^.5])]
Where: C = Cycle Length; g = green time in seconds; v = volume per hour; c = capacity in vehicles per hour; X = v/c = volume to capacity ratio; k = k value;
and PF = Progression Factor.

Note 4 = Level of Service Definition

0 to 10	Seconds of Delay per Vehicle = Level of Service A	(A+ = 0- 3.3 seconds;	A = 3.4- 6.7 seconds;	A- = 6.8-10.0 seconds)
10.1 to 20	Seconds of Delay per Vehicle = Level of Service B	(B+ = 10.1-13.3 seconds;	B = 13.4-16.7 seconds;	B- = 16.8-20.0 seconds)
20.1 to 35	Seconds of Delay per Vehicle = Level of Service C	(C+ = 20.1-25.0 seconds;	C = 25.1-30.0 seconds;	C- = 30.1-35.0 seconds)
35.1 to 55	Seconds of Delay per Vehicle = Level of Service D	(D+ = 35.1-41.7 seconds;	D = 41.8-48.3 seconds;	D- = 48.4-55.0 seconds)
55.1 to 80	Seconds of Delay per Vehicle = Level of Service E	(E+ = 55.1-63.3 seconds;	E = 63.4-71.7 seconds;	E- = 71.8-80.0 seconds)
80.1 and up	Seconds of Delay per Vehicle = Level of Service F	(F+ = 80.1-88.3 seconds;	F = 88.4-96.7 seconds;	F- = 96.7 seconds and up)

Note 5 = Right Turn Arrow
It has been assumed that a right turn arrow is on during the time that the overlapping left turns occur. Overlapping left turns are as follows:
For northbound right, the overlapping left turn is westbound left. For southbound right, the overlapping left turn is eastbound left.
For eastbound right, the overlapping left turn is northbound left. For westbound right, the overlapping left turn is southbound left.

Note 6 = Signal Phases are numbered as follows:

Phase	NR					SR					ER					WR				
	NT	Std	Free	Arrow	NL	ST	Std	Free	Arrow	SL	ET	Std	Free	Arrow	EL	WT	Std	Free	Arrow	WL
Phase 1: EL and WL	.	.	*	*	.	.	.	*	*	.	.	.	*	.	*	.	.	*	.	*
Phase 2: EL and ET and ER (If EL green > WL green)	.	.	*	.	.	.	.	*	*	.	*	*	*	*	*	.	.	*	.	.
Phase 3: WL and WT and WR (If WL green > EL green)	.	.	*	*	.	.	.	*	.	.	.	.	*	.	.	*	*	*	*	*
Phase 4: ET and ER and WT and WR	.	.	*	.	.	.	.	*	.	.	*	*	*	*	.	*	*	*	*	.
Phase 5: NL and SL	.	.	*	.	*	.	.	*	.	*	.	.	*	*	.	.	.	*	*	.
Phase 6: NL and NT and NR (If NL green > SL green)	*	*	*	*	*	.	.	*	.	.	.	.	*	*	.	.	.	*	.	.
Phase 7: SL and ST and SR (If SL green > NL green)	.	.	*	.	.	*	*	*	*	*	.	.	*	.	.	.	.	*	*	.
Phase 8: NT and NR and ST and SR	*	*	*	*	.	*	*	*	*	.	.	.	*	.	.	.	.	*	.	.

Phase order is 1, 2, 3, 4, 5, 6, 7, and 8. Some phases will be skipped. Phases 2 and 3 will never both be used, and phases 6 and 7 will never both be used. Either Phase 2 or 3 will be used, and either Phase 6 or 7 will be used. An 8 phase controller is assumed. If less than 8 phases are needed such as at a Tee intersection, the 8 phase controller is still assumed except that several phases will be skipped.

Note 7 = The Minimum Green Times always meet the following criteria: Larger of (30) + (4) / Cycle, or ((7) + (4)) / Cycle. It also always meets any requirements for right turning vehicles to have enough green time for pedestrians to clear. If possible, it also meets the amount of time needed for pedestrians to walk across the street. If the 'Maximum Cycle Length Needed to Satisfy Pedestrians When Present' is less than the Cycle Length, then that criteria has also been met.

Note 8 = Use of a v/c ratio of 0.95 to determine whether a movement clears is an arbitrary assumption. If an intersection has a v/c ratio of 0.95, its volume could randomly fluctuate by more than 5 percent and the vehicles would still clear. If one movement's random fluctuation was greater than 5 percent, and all other intersection movements were average, the green times would adjust and the intersection would still clear. Using a v/c of 0.95 to estimate whether an intersection clears will be valid a high percentage of the time.

Note 9 = Lost Time in seconds includes unused part of yellow time, all red time, and start up time less extension of effective green time.

Note 10 = ICU is the sum of the critical moves in (32). ICU LOS's are as follows: 0-0.600=LOS A, 0.601-0.700=LOS B, 0.701-0.800=LOS C, 0.801-0.900=LOS D, 0.901-1.000=LOS E, 1.001+=LOS F.

ABBREVIATIONS: NT = Northbound Through; NR = Northbound Right; NL = Northbound Left; ST = Southbound Through; SR = Southbound Right; SL = Southbound Left
ET = Eastbound Through; ER = Eastbound Right; EL = Eastbound Left; WT = Westbound Through; WR = Westbound Right; WL = Westbound Left

( ) = Variable Number. This number corresponds to the variable number as identified in intersection delay calculation tables.

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2001 Average Month W/o Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

MORNING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.37

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 7 NL	64	590	590	526	A
--- SHARED ---	---	---	---	---	---
AM 8 NT	0	660		660	A
AM 9 NR	73	1152	1152	1079	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 10 SL	0	510	510	510	A
--- SHARED ---	---	---	---	---	---
AM 11 ST	0	640	570	640	A
AM 12 SR	0	1152	1152	1152	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
AM 1 EL	0	1308	1308	A
AM 4 WL	426	1308	882	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	53	47	0	0	0	19	59	0	45	0	311
PM	0	0	0	0	0	0	0	0	0	0	0	0
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2001 Average Month W/o Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

EVENING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.07

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 7 NL	55	640	640	585	A
--- SHARED ---	---	---	---	---	---
PM 8 NT	0	710	710	710	A
PM 9 NR	143	1080	1080	937	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 10 SL	0	460	460	460	A
--- SHARED ---	---	---	---	---	---
PM 11 ST	0	680	680	680	A
PM 12 SR	0	1164	1164	1164	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
PM 1 EL	0	1308	1308	A
PM 4 WL	165	1260	1095	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	0	0	0	0	0	0	0	0	0	0	0
PM	0	134	51	0	0	0	61	67	0	37	0	154
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2001 Average Month W/ Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

MORNING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.37

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 7 NL	82	580	580	498	A
--- SHARED ---			580	498	A
AM 8 NT	0	650	650	650	A
AM 9 NR	73	1116	1116	1043	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 10 SL	0	480	480	480	A
--- SHARED ---			530	530	A
AM 11 ST	0	600	600	600	A
AM 12 SR	0	1152	1152	1152	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
AM 1 EL	0	1308	1308	A
AM 4 WL	426	1272	846	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	53	60	0	0	0	19	98	0	45	0	311
PM	0	0	0	0	0	0	0	0	0	0	0	0
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2001 Average Month W/ Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

EVENING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.07

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 7 NL	103	630	630	527	A
--- SHARED ---	---	---	630	527	A
PM 8 NT	0	700	700	700	A
PM 9 NR	143	1068	1068	925	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 10 SL	0	440	440	440	A
--- SHARED ---	---	---	530	530	A
PM 11 ST	0	660	660	660	A
PM 12 SR	0	1164	1164	1164	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
PM 1 EL	0	1308	1308	A
PM 4 WL	165	1236	1071	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	0	0	0	0	0	0	0	0	0	0	0
PM	0	134	96	0	0	0	61	92	0	37	0	154
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2001 Peak Month W/o Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

MORNING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.37

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 7 NL	81	500	500	419	A
--- SHARED ---			500	419	A
AM 8 NT	0	580	580	580	A
AM 9 NR	90	1128	1128	1038	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 10 SL	0	410	410	410	A
--- SHARED ---			470	470	A
AM 11 ST	0	550	550	550	A
AM 12 SR	0	1140	1140	1140	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
AM 1 EL	0	1320	1320	A
AM 4 WL	533	1284	751	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	66	59	0	0	0	24	74	0	56	0	389
PM	0	0	0	0	0	0	0	0	0	0	0	0
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2001 Peak Month W/o Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

EVENING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.07

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 7 NL	68	560	560	492	A
--- SHARED ---			560	491	A
PM 8 NT	0	620	620	620	A
PM 9 NR	180	1056	1056	876	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 10 SL	0	360	360	360	B
--- SHARED ---			450	450	A
PM 11 ST	0	590	590	590	A
PM 12 SR	0	1152	1152	1152	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
PM 1 EL	0	1308	1308	A
PM 4 WL	207	1224	1017	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	0	0	0	0	0	0	0	0	0	0	0
PM	0	168	64	0	0	0	76	84	0	46	0	193
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2001 Peak Month W/ Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

MORNING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.37

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 7 NL	99	490	490	391	B
--- SHARED ---	---	---	490	391	B
AM 8 NT	0	560	560	560	A
AM 9 NR	90	1104	1104	1014	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 10 SL	0	390	390	390	B
--- SHARED ---	---	---	450	450	A
AM 11 ST	0	520	520	520	A
AM 12 SR	0	1140	1140	1140	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
AM 1 EL	0	1320	1320	A
AM 4 WL	533	1248	715	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	66	72	0	0	0	24	113	0	56	0	389
PM	0	0	0	0	0	0	0	0	0	0	0	0
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2001 Peak Month W/ Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

EVENING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.07

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 7 NL	117	550	550	433	A
--- SHARED ---	---	---	550	433	A
PM 8 NT	0	610	610	610	A
PM 9 NR	180	1032	1032	852	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 10 SL	0	340	340	340	B
--- SHARED ---	---	---	430	430	A
PM 11 ST	0	570	570	570	A
PM 12 SR	0	1152	1152	1152	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
PM 1 EL	0	1308	1308	A
PM 4 WL	207	1200	993	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	0	0	0	0	0	0	0	0	0	0	0
PM	0	168	109	0	0	0	76	109	0	46	0	193
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2006 Average Month W/o Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

MORNING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.37

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 7 NL	67	580	580	513	A
--- SHARED ---			580	513	A
AM 8 NT	0	650	650	650	A
AM 9 NR	77	1152	1152	1075	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 10 SL	0	480	480	480	A
--- SHARED ---			540	540	A
AM 11 ST	0	620	620	620	A
AM 12 SR	0	1152	1152	1152	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
AM 1 EL	0	1308	1308	A
AM 4 WL	448	1308	860	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	56	49	0	0	0	20	62	0	47	0	327
PM	0	0	0	0	0	0	0	0	0	0	0	0
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2006 Average Month W/o Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

EVENING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.07

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 7 NL	58	630	630	572	A
--- SHARED ---			630	572	A
PM 8 NT	0	700	700	700	A
PM 9 NR	151	1080	1080	929	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 10 SL	0	440	440	440	A
--- SHARED ---			530	530	A
PM 11 ST	0	670	670	670	A
PM 12 SR	0	1164	1164	1164	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
PM 1 EL	0	1308	1308	A
PM 4 WL	173	1260	1087	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	0	0	0	0	0	0	0	0	0	0	0
PM	0	141	54	0	0	0	64	70	0	39	0	162
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2006 Average Month W/ Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

MORNING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.37

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 7 NL	85	560	560	475	A
--- SHARED ---	---	---	560	475	A
AM 8 NT	0	620	620	620	A
AM 9 NR	77	1116	1116	1039	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 10 SL	0	460	460	460	A
--- SHARED ---	---	---	520	520	A
AM 11 ST	0	590	590	590	A
AM 12 SR	0	1152	1152	1152	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
AM 1 EL	0	1308	1308	A
AM 4 WL	448	1272	824	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	56	62	0	0	0	20	101	0	47	0	327
PM	0	0	0	0	0	0	0	0	0	0	0	0
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2006 Average Month W/ Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

EVENING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.07

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 7 NL	106	620	620	514	A
--- SHARED ---			620	514	A
PM 8 NT	0	690	690	690	A
PM 9 NR	151	1056	1056	905	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 10 SL	0	420	420	420	A
--- SHARED ---			510	510	A
PM 11 ST	0	640	640	640	A
PM 12 SR	0	1164	1164	1164	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
PM 1 EL	0	1308	1308	A
PM 4 WL	173	1224	1051	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	0	0	0	0	0	0	0	0	0	0	0
PM	0	141	99	0	0	0	64	95	0	39	0	162
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2006 Peak Month W/o Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

MORNING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.37

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 7 NL	85	490	490	405	A
--- SHARED ---			490	405	A
AM 8 NT	0	550	550	550	A
AM 9 NR	96	1128	1128	1032	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 10 SL	0	400	400	400	B
--- SHARED ---			460	460	A
AM 11 ST	0	530	530	530	A
AM 12 SR	0	1140	1140	1140	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
AM 1 EL	0	1308	1308	A
AM 4 WL	559	1284	725	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	70	62	0	0	0	25	77	0	59	0	408
PM	0	0	0	0	0	0	0	0	0	0	0	0
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2006 Peak Month W/o Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

EVENING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.07

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 7 NL	72	550	550	478	A
--- SHARED ---			550	478	A
PM 8 NT	0	610	610	610	A
PM 9 NR	188	1044	1044	856	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 10 SL	0	340	340	340	B
--- SHARED ---			430	430	A
PM 11 ST	0	570	570	570	A
PM 12 SR	0	1152	1152	1152	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
PM 1 EL	0	1320	1320	A
PM 4 WL	216	1212	996	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	0	0	0	0	0	0	0	0	0	0	0
PM	0	176	67	0	0	0	80	88	0	49	0	202
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2006 Peak Month W/ Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

MORNING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.37

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 7 NL	103	480	480	377	B
--- SHARED ---			480	377	B
AM 8 NT	0	540	540	540	A
AM 9 NR	96	1104	1104	1008	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
AM 10 SL	0	360	360	360	B
--- SHARED ---			420	420	A
AM 11 ST	0	500	500	500	A
AM 12 SR	0	1140	1140	1140	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
AM 1 EL	0	1308	1308	A
AM 4 WL	559	1248	689	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	70	75	0	0	0	25	116	0	59	0	408
PM	0	0	0	0	0	0	0	0	0	0	0	0
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

CALUCULATION FOR UNSIGNALIZED FOUR-LEG INTERSECTION WITH MINOR STREET STOPPING

Intersection: Conditions: 2006 Peak Month W/ Project
MAJOR STREET: North Shore Drive (EW)
MINOR STREET: Stanfield Cutoff (NS)

EVENING PEAK HOUR

PASSENGER CAR PEAK HOUR ADJUSTMENT FACTOR (1/PHF) = 1.07

SHARED-LANE CAPACITY

$$Csh = \frac{Vi+Vj}{(Vi/Cmi)+(Vj/Cmj)}$$ where 2 movements share a lane

$$Csh = \frac{Vi+Vj+Vk}{(Vi/Cmi)+(Vj/Cmj)+(Vk/Cmk)}$$ where 3 movements share a lane

MINOR STREET APPROACH MOVEMENTS 7,8,9

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 7 NL	120	530	530	410	A
--- SHARED ---			530	410	A
PM 8 NT	0	600	600	600	A
PM 9 NR	188	1032	1032	844	A

MINOR STREET APPROACH MOVEMENTS 10,11,12

Movement	V(pcph)	Cm(pcph)	Csh(pcph)	Cr=Csh-V	LOS
PM 10 SL	0	330	330	330	B
--- SHARED ---			410	410	A
PM 11 ST	0	540	540	540	A
PM 12 SR	0	1152	1152	1152	A

MAJOR STREET LEFT TURNS 1,4

Movement	V(pcph)	Cm(pcph)	Cr=Csh-V	LOS
PM 1 EL	0	1320	1320	A
PM 4 WL	216	1188	972	A

TURNING MOVEMENT VOLUMES AND LANE GEOMETRICS:

	NT	NR	NL	ST	SR	SL	ET	ER	EL	WT	WR	WL
AM	0	0	0	0	0	0	0	0	0	0	0	0
PM	0	176	112	0	0	0	80	113	0	49	0	202
GEOMETRICS	1	1	0	1	1	0	1	1	0	1	0	0

Fawnskin 92 Single Family Homes

APPENDIX C

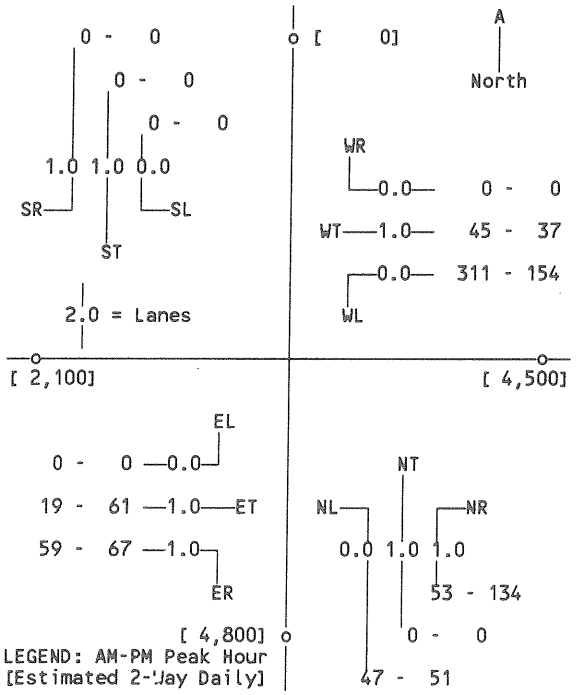
Existing Intersection Turning Movement Counts, Plots, and Estimation of Daily Volumes

INTERSECTION TURNING MOVEMENT VOLUMES, LEG VOLUMES, AND LANES

INTERSECTION: 1. Stanfield Cutoff (NS) and North Shore (EW)
LAND USE: 2001 Average Month Without Project

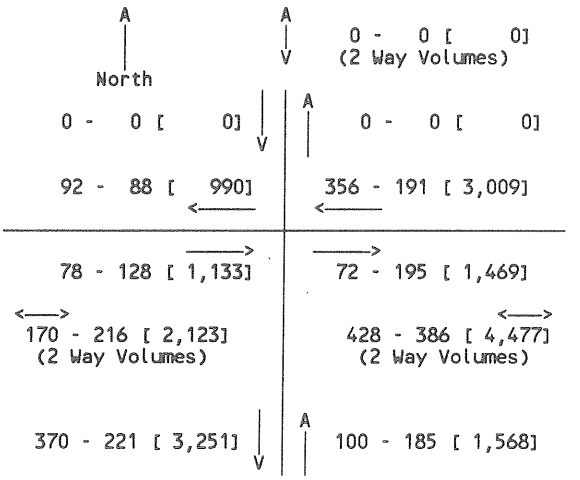
COUNT DATE: 3-20-2001
GEOMETRICS: Existing

PLOT OF PEAK HOUR TURNING VOLUMES AND LANES



LEGEND: AM-PM Peak Hour
[Estimated 2-Way Daily]

PLOT OF INTERSECTION LEG VOLUMES



LEGEND:
AM-PM Peak Hour [Daily]
Daily = (AM+PM)* 5.5

A
V
470 - 406 [4,818]
(2 Way Volumes)

Leg:	North	South	East	West
% Entering (AM-PM)	0 - 0	21 - 46	83 - 49	46 - 59
% of Daily in Peak Hour (AM-PM)	0 - 0	10 - 8	10 - 9	8 - 10

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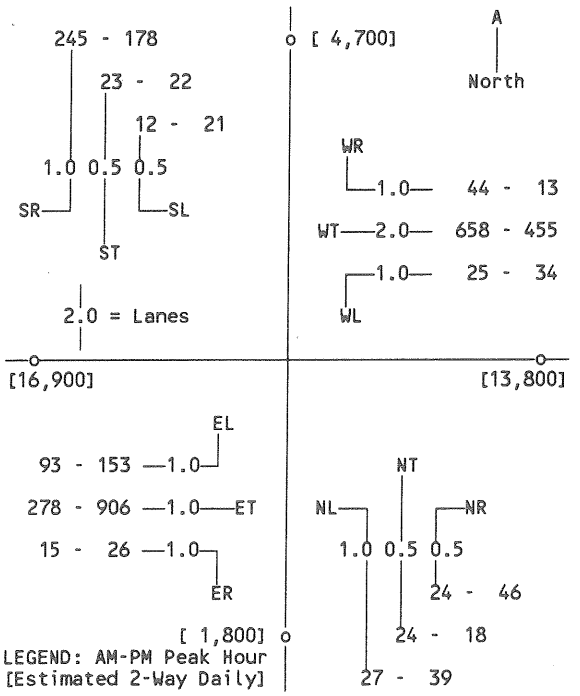
INTERSECTION TURNING MOVEMENT VOLUMES, LEG VOLUMES, AND LANES

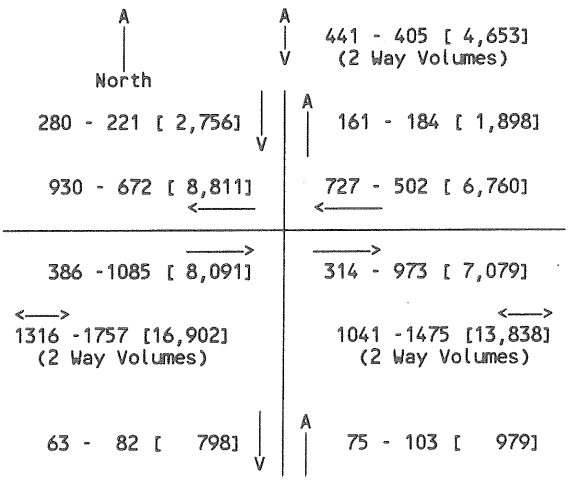
INTERSECTION: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
LAND USE: 2001 Average Month Without Project

COUNT DATE: 3-20-2001
GEOMETRICS: Existing

PLOT OF PEAK HOUR TURNING VOLUMES AND LANES



PLOT OF INTERSECTION LEG VOLUMES



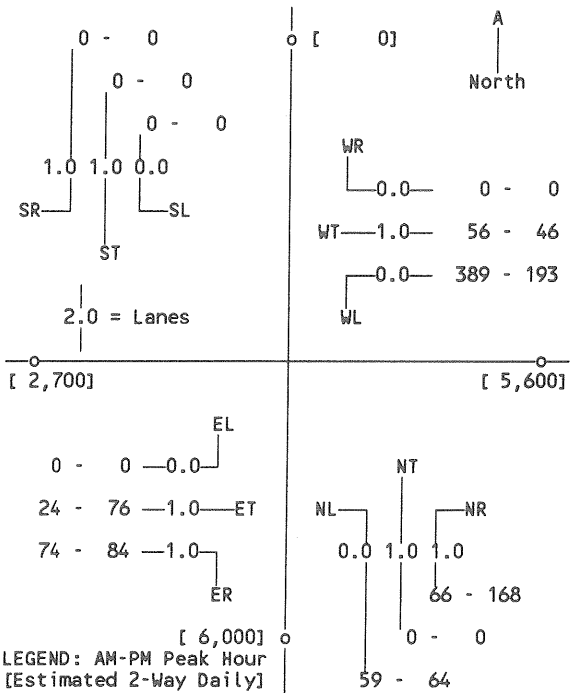
Leg:	North	South	East	West
% Entering (AM-PM)	63 - 55	54 - 56	70 - 34	29 - 62
% of Daily in Peak Hour (AM-PM)	9 - 9	8 - 10	8 - 11	8 - 10

INTERSECTION TURNING MOVEMENT VOLUMES, LEG VOLUMES, AND LANES

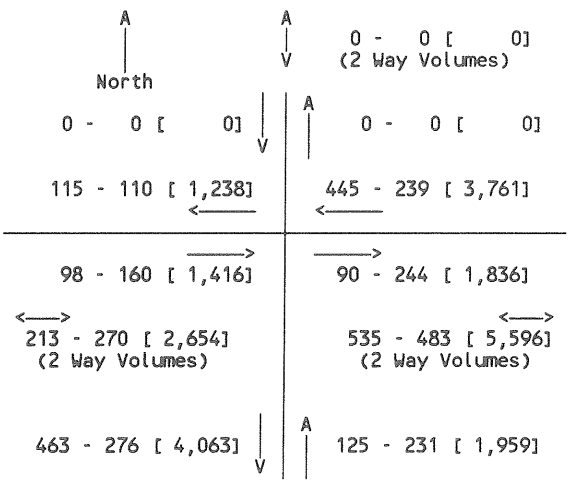
INTERSECTION: 1. Stanfield Cutoff (NS) and North Shore (EW)
LAND USE: 2001 Peak Month Without Project

COUNT DATE: 3-20-2001
GEOMETRICS: Existing

PLOT OF PEAK HOUR TURNING VOLUMES AND LANES



PLOT OF INTERSECTION LEG VOLUMES



LEGEND:
AM-PM Peak Hour [Daily]
Daily = {AM+PM}* 5.5

A
588 - 508 [6,023]
(2 Way Volumes)

Leg:	North	South	East	West
% Entering (AM-PM)	0 - 0	21 - 46	83 - 49	46 - 59
% of Daily in Peak Hour (AM-PM)	0 - 0	10 - 8	10 - 9	8 - 10

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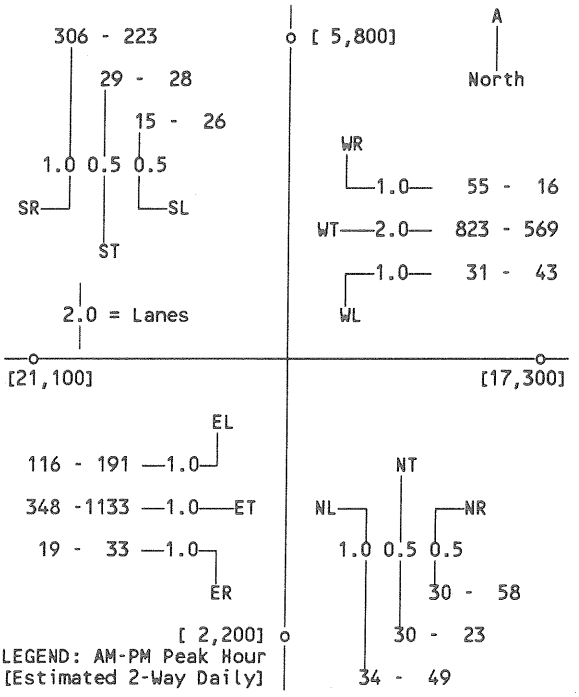
INTERSECTION TURNING MOVEMENT VOLUMES, LEG VOLUMES, AND LANES

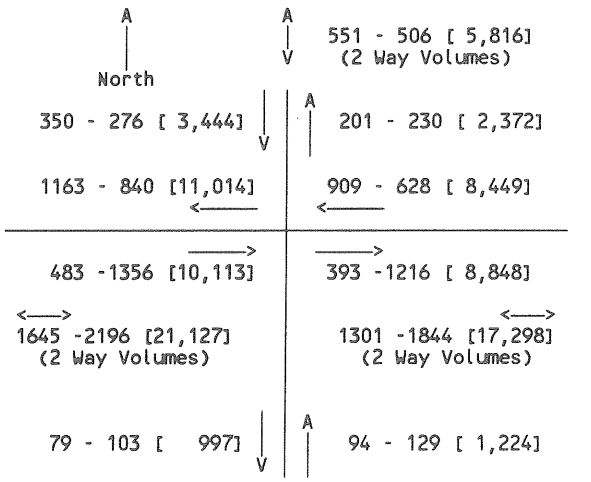
INTERSECTION: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
LAND USE: 2001 Peak Month Without Project

COUNT DATE: 3-20-2001
GEOMETRICS: Existing

PLOT OF PEAK HOUR TURNING VOLUMES AND LANES



PLOT OF INTERSECTION LEG VOLUMES



Leg:	North	South	East	West
% Entering (AM-PM)	63 - 55	54 - 56	70 - 34	29 - 62
% of Daily in Peak Hour (AM-PM)	9 - 9	8 - 10	8 - 11	8 - 10

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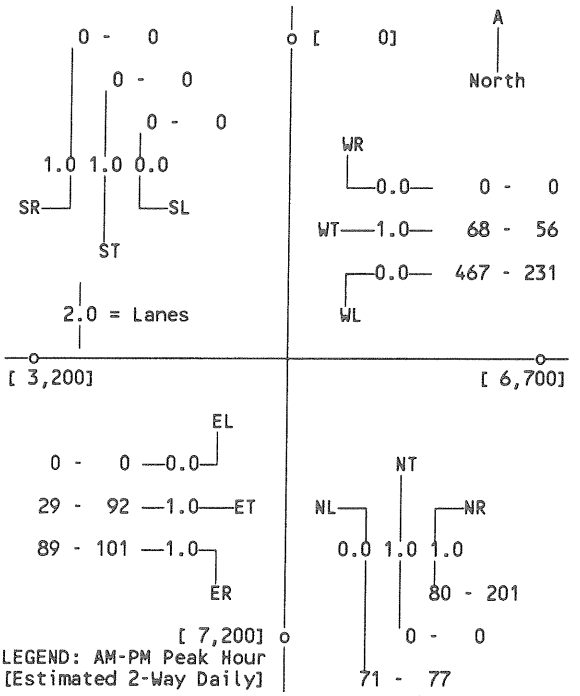
INTERSECTION TURNING MOVEMENT VOLUMES, LEG VOLUMES, AND LANES

INTERSECTION: 1. Stanfield Cutoff (NS) and North Shore (EW)
LAND USE: 2006 Average Month Without Project

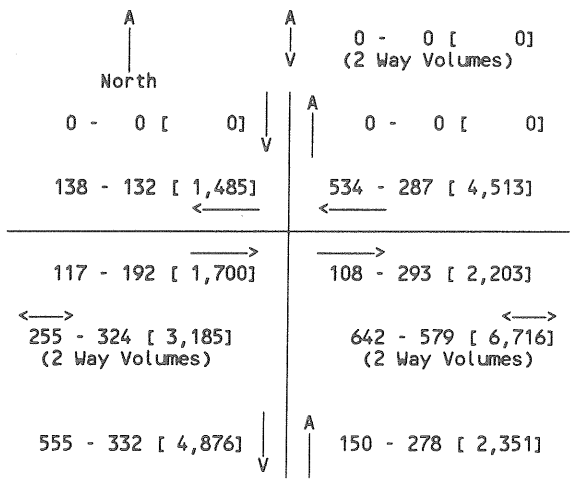
COUNT DATE: 3-20-2001
GEOMETRICS: Existing

PLOT OF PEAK HOUR TURNING VOLUMES AND LANES



LEGEND: AM-PM Peak Hour
[Estimated 2-Way Daily]

PLOT OF INTERSECTION LEG VOLUMES



LEGEND:
AM-PM Peak Hour [Daily]
Daily = (AM+PM)* 5.5

A
V
705 - 609 [7,227]
(2 Way Volumes)

Leg:	North	South	East	West
% Entering (AM-PM)	0 - 0	21 - 46	83 - 49	46 - 59
% of Daily in Peak Hour (AM-PM)	0 - 0	10 - 8	10 - 9	8 - 10

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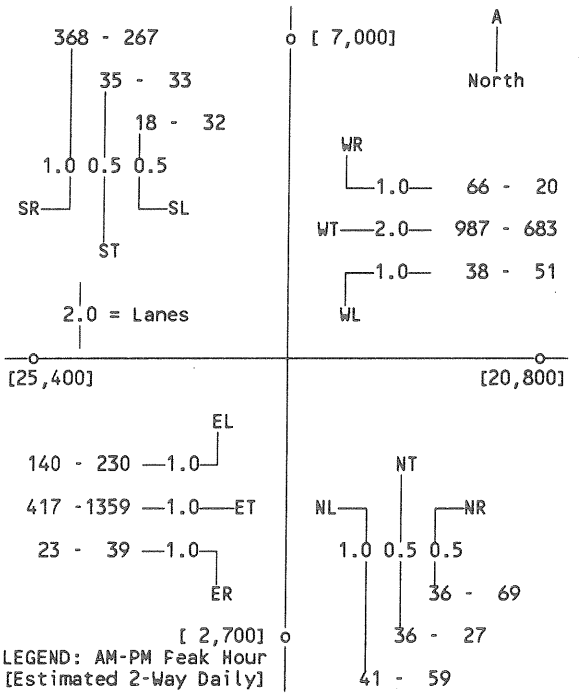
INTERSECTION TURNING MOVEMENT VOLUMES, LEG VOLUMES, AND LANES

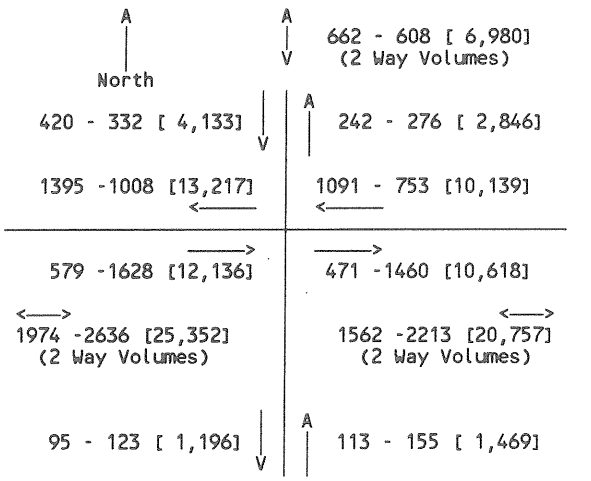
INTERSECTION: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
LAND USE: 2006 Average Month Without Project

COUNT DATE: 3-20-2001
GEOMETRICS: Existing

PLOT OF PEAK HOUR TURNING VOLUMES AND LANES



PLOT OF INTERSECTION LEG VOLUMES



Leg:	North	South	East	West
% Entering (AM-PM)	63 - 55	54 - 56	70 - 34	29 - 62
% of Daily in Peak Hour (AM-PM)	9 - 9	8 - 10	8 - 11	8 - 10

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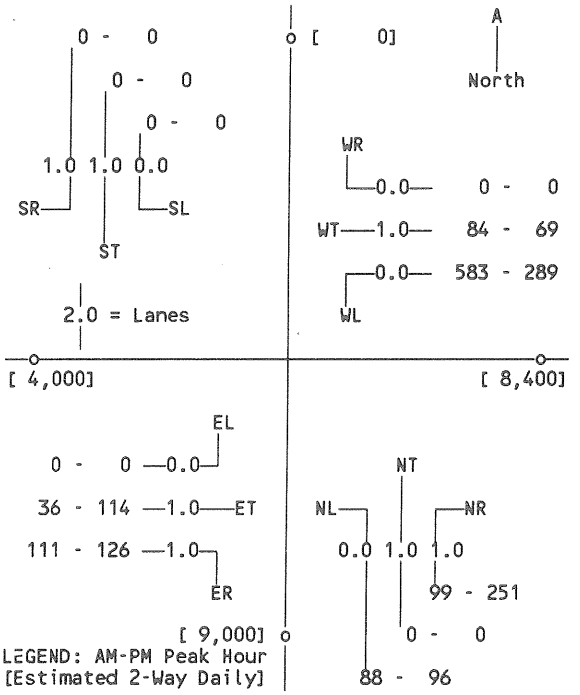
INTERSECTION TURNING MOVEMENT VOLUMES, LEG VOLUMES, AND LANES

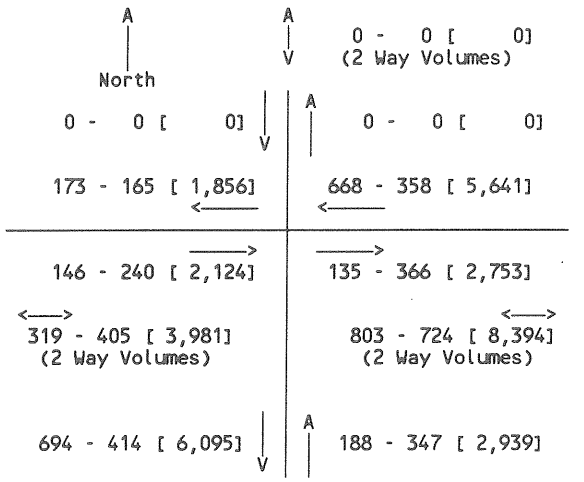
INTERSECTION: 1. Stanfield Cutoff (NS) and North Shore (EW)
LAND USE: 2006 Peak Month Without Project

COUNT DATE: 3-20-2001
GEOMETRICS: Existing

PLOT OF PEAK HOUR TURNING VOLUMES AND LANES



PLOT OF INTERSECTION LEG VOLUMES



Leg:	North	South	East	West
% Entering (AM-PM)	0 - 0	21 - 46	83 - 49	46 - 59
% of Daily in Peak Hour (AM-PM)	0 - 0	10 - 8	10 - 9	8 - 10

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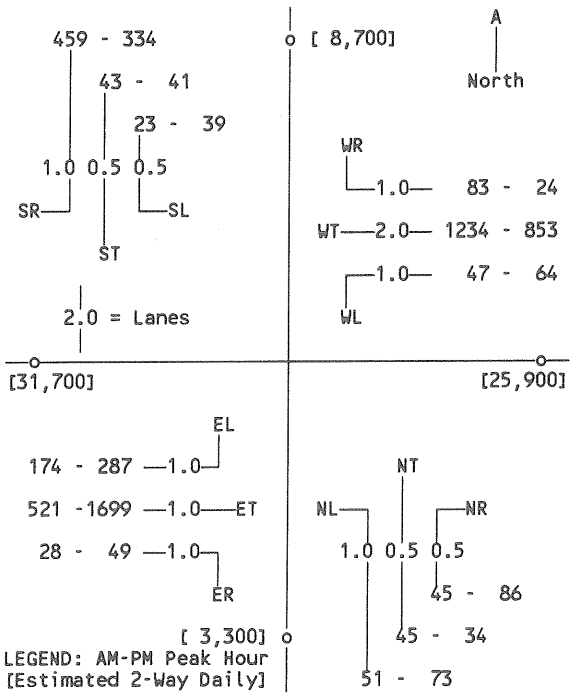
INTERSECTION TURNING MOVEMENT VOLUMES, LEG VOLUMES, AND LANES

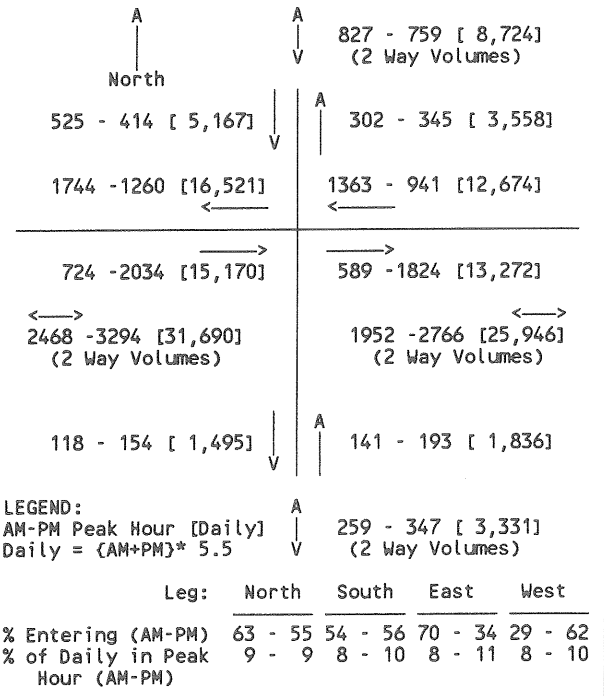
INTERSECTION: 2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)
LAND USE: 2006 Peak Month Without Project

COUNT DATE: 3-20-2001
GEOMETRICS: Existing

PLOT OF PEAK HOUR TURNING VOLUMES AND LANES



PLOT OF INTERSECTION LEG VOLUMES



Leg:	North	South	East	West
% Entering (AM-PM)	63 - 55	54 - 56	70 - 34	29 - 62
% of Daily in Peak Hour (AM-PM)	9 - 9	8 - 10	8 - 11	8 - 10

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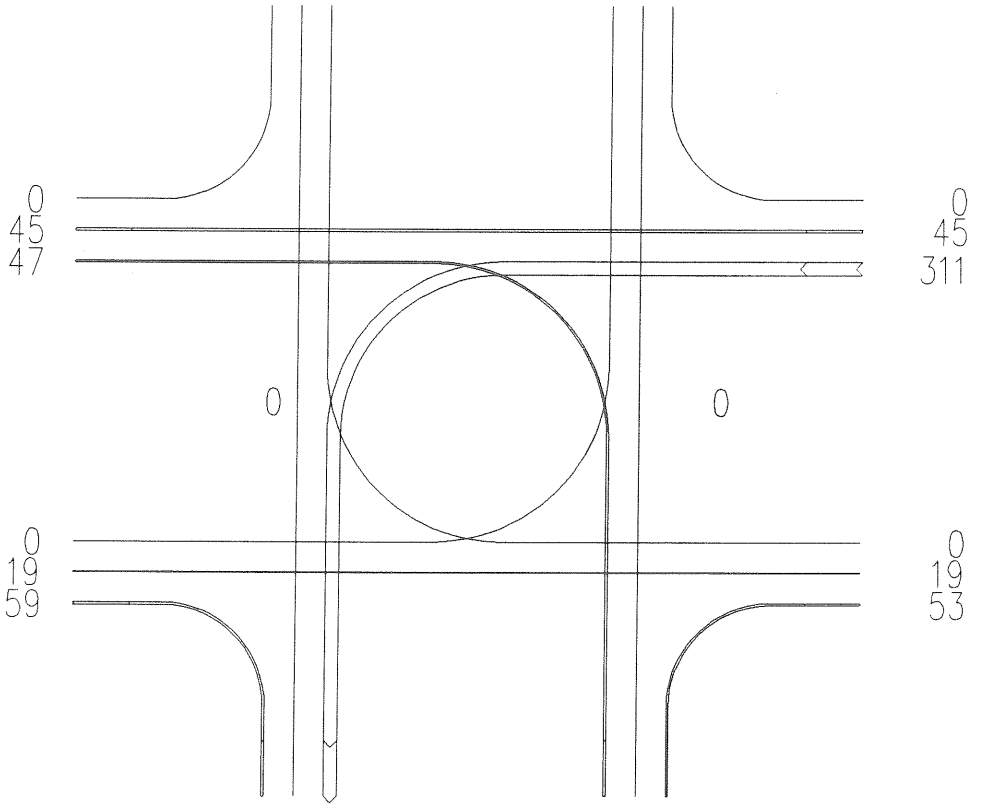
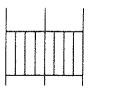
Intersection Peak Hour Turning Movement Volumes

INTERSECTION: 1. Stanfield Cutoff (NS) and North Shore Drive (EW)

Peak Hour = MORNING Day = Tuesday Date = 3-20-2001



SCALE: Volume in 1000s



Leg	Inbound	Outbound	Total	% Inbound
North Leg	0	0	0	.0000
South Leg	100	370	470	21.27
East Leg	356	72	428	83.17
West Leg	78	92	170	45.88
Total	534	534		

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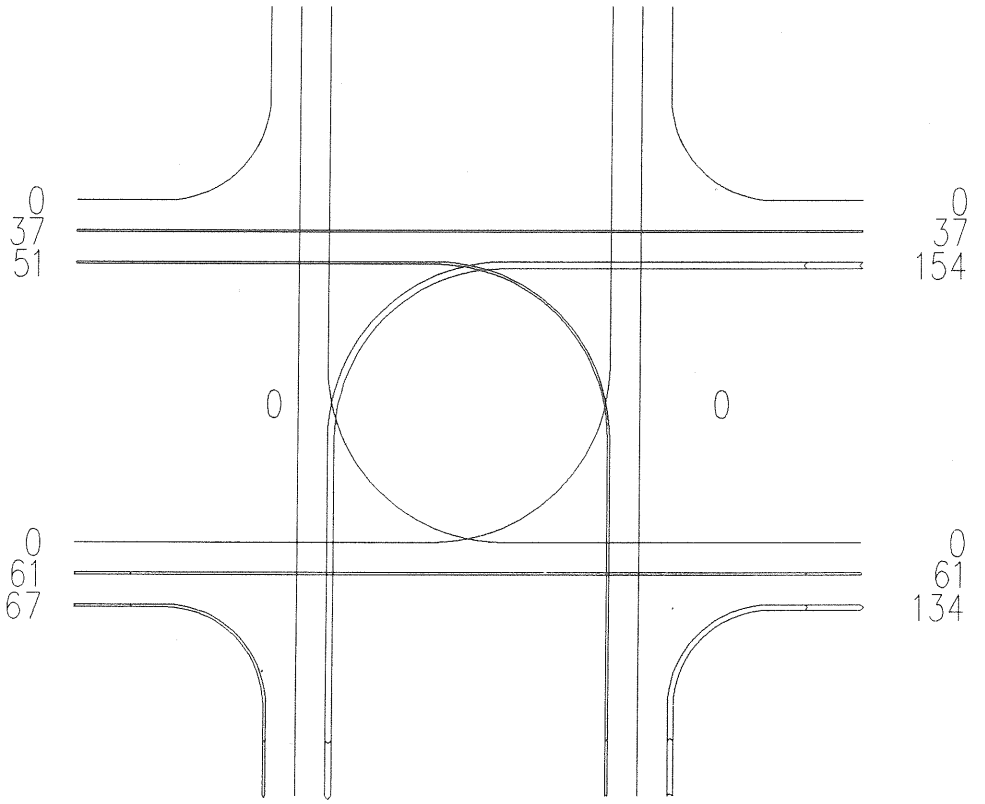
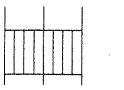
Intersection Peak Hour Turning Movement Volumes

INTERSECTION: 1. Stanfield Cutoff (NS) and North Shore Drive (EW)

Peak Hour = EVENING Day = Tuesday Date = 3-20-2001



SCALE: Volume in 1000s



Leg	Inbound	Outbound	Total	% Inbound
North Leg	0	0	0	.0000
South Leg	185	221	406	45.56
East Leg	191	195	386	49.48
West Leg	128	88	216	59.25
Total	504	504		

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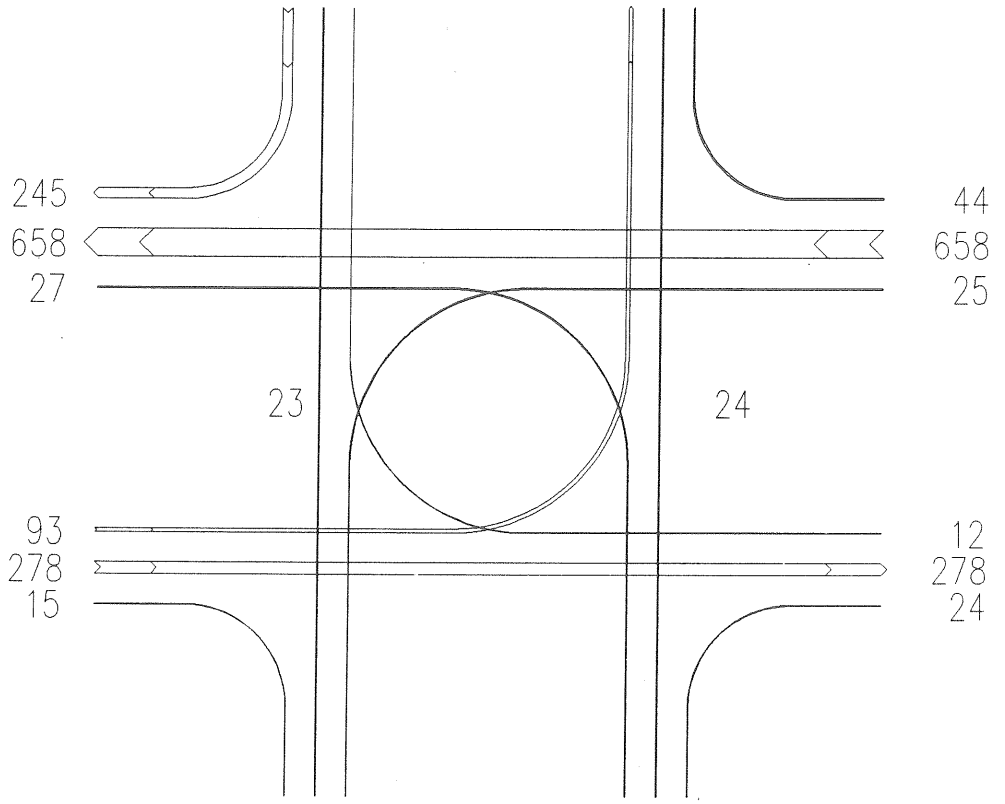
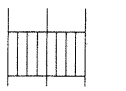
Intersection Peak Hour Turning Movement Volumes

INTERSECTION: 2. Stanfield Cutoff (NS) and Big Bear Boulevard (EW)

Peak Hour = MORNING Day = Tuesday Date = 3-20-2001



SCALE: Volume in 1000s



Leg	Inbound	Outbound	Total	% Inbound
North Leg	280	161	441	63.49
South Leg	75	63	138	54.34
East Leg	727	314	1041	69.83
West Leg	386	930	1316	29.33
Total	1468	1468		

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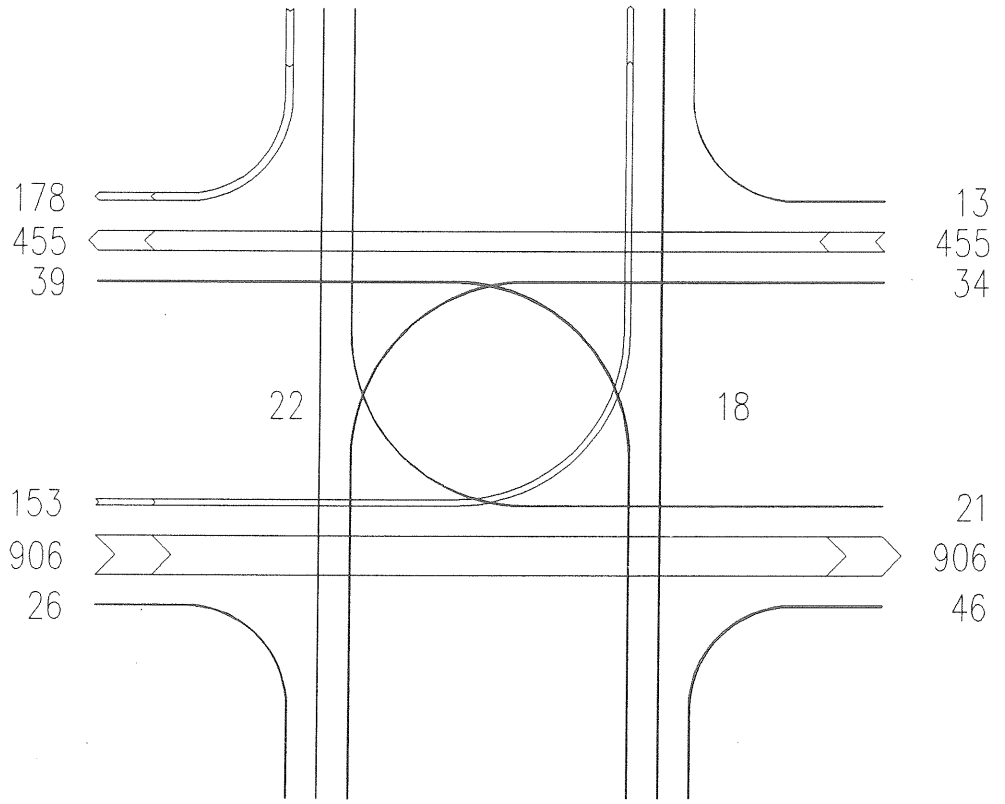
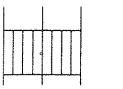
Intersection Peak Hour Turning Movement Volumes

INTERSECTION: 2. Stanfield Cutoff (NS) and Big Bear Boulevard (EW)

Peak Hour = EVENING Day = Tuesday Date = 3-20-2001



SCALE: Volume in 1000s



Leg	Inbound	Outbound	Total	% Inbound
North Leg	221	184	405	54.56
South Leg	103	82	185	55.67
East Leg	502	973	1475	34.03
West Leg	1085	672	1757	61.75
Total	1911	1911		

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SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: STANFIELD CUTOFF
DATE: 3/20/2001
CITY: BIG BEAR LAKE
E-W STREET: NORTH SHORE
DAY: TUESDAY
PROJECT# 0314001A

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0					1	0	0	1		
6:00 AM													
15 AM													
30 AM													
45 AM													
7:00 AM	8		7					8	5	40	13		81
15 AM	7		9					5	12	46	7		86
30 AM	11		12					4	12	45	15		99
45 AM	5		13					2	7	93	11		131
8:00 AM	8		15					2	8	51	12		96
15 AM	8		6					1	16	72	8		111
30 AM	15		15					8	21	109	14		182
45 AM	16		17					8	14	79	11		145
9:00 AM													
15 AM													
30 AM													
45 AM													
10:00 AM													
15 AM													
30 AM													
45 AM													
TOTAL VOLUMES =	78	0	94	0	0	0	0	38	95	535	91	0	931

AM Peak Hr Begins at 800 AM

PEAK VOLUMES =	47	0	53	0	0	0	0	19	59	311	45	0	534

ADDITIONS:1-WAY STOP N/B

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: STANFIELD CUTOFF
E-W STREET: NORTH SHORE
DATE: 3/20/2001
DAY: TUESDAY
CITY: BIG BEAR LAKE
PROJECT# 0314001P

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0					1	0	0	1		
2:00 PM													
15 PM													
30 PM													
45 PM													
3:00 PM													
15 PM													
30 PM													
45 PM													
4:00 PM	10		22					8	15	26	9		90
15 PM	9		28					11	14	34	11		107
30 PM	14		37					16	18	39	10		134
45 PM	13		36					19	16	31	7		122
5:00 PM	14		34					15	19	45	12		139
15 PM	10		27					11	14	39	8		109
30 PM	6		22					14	10	36	10		98
45 PM	12		19					11	14	30	7		93
6:00 PM													
15 PM													
30 PM													
45 PM													
TOTAL VOLUMES =	88	0	225	0	0	0	0	105	120	280	74	0	892
PEAK VOLUMES =	51	0	134	0	0	0	0	61	67	154	37	0	504

PM Peak Hr Begins at 430 PM

ADDITIONS:1-WAY STOP N/B

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: STANFIELD CUTOFF
DATE: 3/20/2001
CITY: BIG BEAR LAKE
E-W STREET: BIG BEAR BL
DAY: TUESDAY
PROJECT# 0314002A

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	0.5	0.5	0.5	0.5	1	1	1	1	1	2	0	
6:00 AM													
15 AM													
30 AM													
45 AM													
7:00 AM	6	4	7	2	0	38	13	72	4	8	111	2	267
15 AM	2	5	2	1	2	53	19	83	5	8	172	3	355
30 AM	12	8	4	3	2	29	19	52	0	8	151	8	296
45 AM	3	7	6	0	5	86	24	72	2	3	213	7	428
8:00 AM	10	9	5	1	2	52	16	57	5	7	162	4	330
15 AM	6	5	5	1	6	53	18	69	4	5	150	13	335
30 AM	6	2	3	5	6	55	26	67	3	7	147	21	348
45 AM	5	8	11	5	9	85	33	85	3	6	199	6	455
9:00 AM													
15 AM													
30 AM													
45 AM													
10:00 AM													
15 AM													
30 AM													
45 AM													
TOTAL VOLUMES =	50	48	43	18	32	451	168	557	26	52	1305	64	2814

AM Peak Hr Begins at 800 AM

PEAK VOLUMES =	27	24	24	12	23	245	93	278	15	25	658	44	1468

ADDITIONS:1-WAY STOP N/B

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: STANFIELD CUTOFF
DATE: 3/20/2001
CITY: BIG BEAR LAKE
E-W STREET: BIG BEAR BL
DAY: TUESDAY
PROJECT# 0314002P

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	0.5	0.5	0.5	0.5	1	1	1	1	1	2	0	
2:00 PM													
15 PM													
30 PM													
45 PM													
3:00 PM													
15 PM													
30 PM													
45 PM													
4:00 PM	9	7	11	6	5	43	29	195	12	9	101	8	435
15 PM	12	5	9	7	6	51	37	211	8	11	111	5	473
30 PM	9	7	12	8	7	48	46	226	3	10	117	2	495
45 PM	10	4	14	5	5	42	39	239	7	8	123	4	500
5:00 PM	8	2	11	1	4	37	31	230	8	5	104	2	443
15 PM	6	1	12	5	6	44	35	217	6	7	110	3	452
30 PM	4	1	15	9	3	38	38	203	4	6	92	1	414
45 PM	6	0	9	5	2	33	32	187	5	5	86	1	371
6:00 PM													
15 PM													
30 PM													
45 PM													
TOTAL VOLUMES =	64	27	93	46	38	336	287	1708	53	61	844	26	3583

PM Peak Hr Begins at 415 PM

PEAK VOLUMES =	39	18	46	21	22	178	153	906	26	34	455	13	1911

ADDITIONS:1-WAY STOP N/B

15.4 Air Quality Data

Parenthetical URBEMIS2002 Assumptions
For: Moon Camp
Date: 7/1/2003

LAND USES

Amount	Land Use Type	Trip Rate	Unit Type
92	SF Units	9.57	-

CONSTRUCTION SOURCES

Overall Construction Settings:

Construction Start Year

Year	Month	Working Days/Month
2005	January	22 (assumed normal average)

Length of Construction Periods (Months) – Default (12 months)

Length of Phase 1 (Demolition) – 0.6 months
Length of Phase 2 (Site Grading) – 1.2 Months
Length of Phase 3 (Building) – 10.2 Months
Length of Subphase 3
Building - 10.2 Months
Architectural Coatings – 1 Month
Asphalt – 0.5 Months
Mitigation (On/Off)
Phase 1 - On
Phase 2 - On
Phase 3 - On

Phase 1 - Demolition:

Demolition and On Road Emissions Settings

Total Volume – 10,896 cubic feet

Maximum Daily Volume – 1089.6 cubic feet

Equipment Exhaust

1 Off-Highway Trucks	8 hour operation
2 Tractor/Loader Backhoe	8 hour operation

Phase 2 - Site Grading:

Maximum Daily Acreage Disturbed

Total Acres – 18.4

Total Disturbed – 4.5

Fugitive Dust:

(URBEMIS2002 default all phases)

Soil Hauling

(URBEMIS2002 default all phases)

Equipment Exhaust:

1 Grader	8 hour operation
1 Off-Highway Trucks	8 hour operation
1 Rough Terrain Forklift	8 hour operation
1 Scraper	8 hour operation
1 Tractor/Loader Backhoe	8 hour operation

Phase 3 – Building Equipment:

Equipment Exhaust:

1 Off-Highway Tractor
2 Off-Highway Trucks
1 Rough Terrain Forklift
1 Trencher

Phase 3 – Architectural Coatings:

(URBEMIS2002 default all phases)

Phase 3 – Asphalt

Asphalt Paving Emissions

Total Acres – 2.5

Equipment Exhaust

1 Off-Highway Truck	8 hour operation
1 Paver	8 hour operation
2 Paving Equipment	8 hour operation
1 Roller	8 hour operation
1 Surfacing Equipment	8 hour operation

Phase 3 - Worker Commute

(URBEMIS2002 default all phases)

Construction Mitigation:

Refer to URBEMIS2002 file output.

AREA SOURCES

Natural Gas Fuel Combustion:

(URBEMIS2002 default all phases)

Wood Stoves Fuel Combustion:

Off

Fireplaces:

On

Landscape Maintenance Equipment:

Year 2010 at 180 days

Consumer Products:

(URBEMIS2002 default all phases)

Area Source Mitigation:

Refer to URBEMIS2002 file output.

OPERATIONAL SOURCES

Vehicle Fleet %:

(URBEMIS2002 default all phases)

Year:

Year of Completion – 2010

Trip Characteristics:

(URBEMIS2002 Default all phases)

Temperature Data:

30 to 90 degrees Fahrenheit

Variable Starts:

(URBEMIS2002 default all phases)

Road Dust:

Paved – 100%
Unpaved – 0%

Pass By Trips (On/Off):

Off

Double-Counting(On/Off):

Off

Operational Mitigation Measures:

Refer to URBEMIS2002 file output.

URBEMIS 2002 For Windows 7.4.2

File Name: I:\pdata\00000100\10P\WPWIN\EddieT\URBEMIS\URBEMIS2002\Moon Camp.urb
Project Name: Moon Camp
Project Location: Mountain Counties and Rural Counties
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2005 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	400.31	162.54	192.59	0.06	52.12	7.11	45.01
TOTALS (lbs/day, mitigated)	400.31	162.54	192.59	0.06	20.42	7.11	13.31

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.64	1.17	1.02	0.02	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	9.15	10.57	119.16	0.09	14.26
TOTALS (lbs/day, mitigated)	9.01	10.37	116.97	0.09	14.00

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	13.79	11.73	120.18	0.11	14.26

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

URBEMIS 2002 For Windows 7.4.2

File Name: I:\pdata\00000100\10P\WPWIN\EddieT\URBEMIS\URBEMIS2002\Moon Camp.urb
Project Name: Moon Camp
Project Location: Mountain Counties and Rural Counties
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

*** 2005 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	400.31	162.54	192.59	0.06	52.12	7.11	45.01
TOTALS (lbs/day, mitigated)	400.31	162.54	192.59	0.06	20.42	7.11	13.31

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1,035.07	12.85	1,137.17	1.80	155.70

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	10.11	17.39	127.81	0.08	14.26
TOTALS (lbs/day, mitigated)	9.92	17.08	125.47	0.08	14.00

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	1,045.18	30.25	1,264.98	1.88	169.96

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

URBEMIS 2002 For Windows 7.4.2

File Name: I:\pdata\00000100\10P\WPWIN\EddieT\URBEMIS\URBEMIS2002\Moon Camp.urb
Project Name: Moon Camp
Project Location: Mountain Counties and Rural Counties
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Tons/Year)

CONSTRUCTION EMISSION ESTIMATES

*** 2005 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (tpy, unmitigated)	5.62	9.62	12.40	0.00	5.09	0.38	0.60
TOTALS (tpy, mitigated)	5.62	9.62	12.40	0.00	3.41	0.38	0.18

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	43.09	0.69	46.74	0.08	6.38

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	1.73	2.34	22.27	0.02	2.60
TOTALS (tpy, mitigated)	1.70	2.30	21.86	0.02	2.55

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	44.82	3.03	69.01	0.09	8.99

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

URBEMIS 2002 For Windows 7.4.2

File Name: I:\pdata\00000100\10P\WPWIN\EddieT\URBEMIS\URBEMIS2002\Moon Camp.urb
Project Name: Moon Camp
Project Location: Mountain Counties and Rural Counties
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

Construction Start Month and Year: January, 2005
Construction Duration: 12
Total Land Use Area to be Developed: 18.4 acres
Maximum Acreage Disturbed Per Day: 4.5 acres
Single Family Units: 92 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source *** 2005***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.46	-	0.46
Off-Road Diesel	4.90	33.70	39.47	-	1.51	1.51	0.00
On-Road Diesel	0.09	1.84	0.34	0.03	0.05	0.04	0.01
Worker Trips	0.06	0.22	1.86	0.00	0.01	0.00	0.01
Maximum lbs/day	5.05	35.76	41.67	0.03	2.03	1.55	0.48
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	45.00	-	45.00
Off-Road Diesel	8.68	63.31	66.97	-	2.86	2.86	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.14	0.35	3.35	0.00	0.01	0.00	0.01
Maximum lbs/day	8.82	63.66	70.32	0.00	47.87	2.86	45.01
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	10.83	72.17	89.05	-	3.16	3.16	0.00
Bldg Const Worker Trips	0.47	0.28	6.19	0.00	0.10	0.00	0.10
Arch Coatings Off-Gas	375.99	-	-	-	-	-	-
Arch Coatings Worker Trips	0.47	0.28	6.19	0.00	0.10	0.00	0.10
Asphalt Off-Gas	0.60	-	-	-	-	-	-
Asphalt Off-Road Diesel	11.68	85.69	89.66	-	3.85	3.85	0.00
Asphalt On-Road Diesel	0.20	4.09	0.76	0.06	0.09	0.09	0.00
Asphalt Worker Trips	0.06	0.03	0.75	0.00	0.01	0.00	0.01
Maximum lbs/day	400.31	162.54	192.59	0.06	7.33	7.11	0.22
Max lbs/day all phases	400.31	162.54	192.59	0.06	52.12	7.11	45.01

Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Jan '05
Phase 1 Duration: 0.6 months
Building Volume Total (cubic feet): 10896
Building Volume Daily (cubic feet): 1089.6
On-Road Truck Travel (VMT): 60
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '05
Phase 2 Duration: 1.2 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Scrapers	313	0.660	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '05
Phase 3 Duration: 10.2 months
Start Month/Year for SubPhase Building: Feb '05
SubPhase Building Duration: 10.2 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Trenchers	82	0.695	8.0

Start Month/Year for SubPhase Architectural Coatings: Dec '05
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: Dec '05
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 2.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
1	Pavers	132	0.590	8.0
2	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0
1	Surfacing Equipment	437	0.490	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2005***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.46	-	0.46
Off-Road Diesel	4.90	33.70	39.47	-	1.51	1.51	0.00
On-Road Diesel	0.09	1.84	0.34	0.03	0.05	0.04	0.01
Worker Trips	0.06	0.22	1.86	0.00	0.01	0.00	0.01
Maximum lbs/day	5.05	35.76	41.67	0.03	2.03	1.55	0.48
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	13.30	-	13.30
Off-Road Diesel	8.68	63.31	66.97	-	2.86	2.86	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.14	0.35	3.35	0.00	0.01	0.00	0.01
Maximum lbs/day	8.82	63.66	70.32	0.00	16.17	2.86	13.31
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	10.83	72.17	89.05	-	3.16	3.16	0.00
Bldg Const Worker Trips	0.47	0.28	6.19	0.00	0.10	0.00	0.10
Arch Coatings Off-Gas	375.99	-	-	-	-	-	-
Arch Coatings Worker Trips	0.47	0.28	6.19	0.00	0.10	0.00	0.10
Asphalt Off-Gas	0.60	-	-	-	-	-	-
Asphalt Off-Road Diesel	11.68	85.69	89.66	-	3.85	3.85	0.00
Asphalt On-Road Diesel	0.20	4.09	0.76	0.06	0.09	0.09	0.00
Asphalt Worker Trips	0.06	0.03	0.75	0.00	0.01	0.00	0.01
Maximum lbs/day	400.31	162.54	192.59	0.06	7.33	7.11	0.22
Max lbs/day all phases	400.31	162.54	192.59	0.06	20.42	7.11	13.31

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 3.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Jan '05
Phase 1 Duration: 0.6 months
Building Volume Total (cubic feet): 10896
Building Volume Daily (cubic feet): 1089.6
On-Road Truck Travel (VMT): 60
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '05
Phase 2 Duration: 1.2 months

On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Scrapers	313	0.660	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '05
Phase 3 Duration: 10.2 months
Start Month/Year for SubPhase Building: Feb '05
SubPhase Building Duration: 10.2 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Trenchers	82	0.695	8.0

Start Month/Year for SubPhase Architectural Coatings: Dec '05
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: Dec '05
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 2.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
1	Pavers	132	0.590	8.0
2	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0
1	Surfacing Equipment	437	0.490	8.0

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.09	1.15	0.49	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	1,030.48	11.70	1,136.68	1.80	155.70
Landscaping - No winter emissions					
Consumer Prdcts	4.50	-	-	-	-
TOTALS(lbs/day,unmitigated)	1,035.07	12.85	1,137.17	1.80	155.70

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	10.11	17.39	127.81	0.08	14.26
TOTAL EMISSIONS (lbs/day)	10.11	17.39	127.81	0.08	14.26

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 30 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.57 trips / dwelling units	92.00	880.44

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

MITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	9.92	17.08	125.47	0.08	14.00
TOTAL EMISSIONS (lbs/day)	9.92	17.08	125.47	0.08	14.00

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 30 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.57 trips / dwelling units	92.00	880.44

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

ENVIRONMENTAL FACTORS APPLICABLE TO THE PROJECT

Pedestrian Environment

0.0 Side Walks/Paths: No Sidewalks
0.0 Street Trees Provide Shade: No Coverage
0.0 Pedestrian Circulation Access: No Destinations
0.0 Visually Interesting Uses: No Uses within Walking Distance
0.0 Street System Enhances Safety: No Streets
0.0 Pedestrian Safety from Crime: No Degree of Safety
0.0 Visually Interesting Walking Routes: No Visual Interest

3.8 <- Pedestrian Environmental Credit
3.8 /19 = 0.2 <- Pedestrian Effectiveness Factor

Transit Service

0.0 Transit Service: Dial-A-Ride or No Transit Service

0.0 <- Transit Effectiveness Credit
3.8 <- Pedestrian Factor
3.8 <-Total
3.8 /110 = 0.0 <-Transit Effectiveness Factor

Bicycle Environment

0.0 Interconnected Bikeways: No Bikeway Coverage
0.0 Bike Routes Provide Paved Shoulders: No Routes
0.0 Safe Vehicle Speed Limits: No Routes Provided
0.0 Safe School Routes: No Schools
0.0 Uses w/in Cycling Distance: No Uses w/in Cycling Distance
0.0 Bike Parking Ordinance: No Ordinance or Unenforceable

4.0 <- Bike Environmental Credit
4.0 /20 = 0.2 <- Bike Effectiveness Factor

MITIGATION MEASURES SELECTED FOR THIS PROJECT
(All mitigation measures are printed, even if
the selected land uses do not constitute a mixed use.)

Transit Infrastructure Measures

% Trips Reduced	Measure
15.0	Credit for Existing or Planned Community Transit Service
15.0 <- Totals	

Pedestrian Enhancing Infrastructure Measures (Residential)

% Trips Reduced	Measure
2.0	Credit for Surrounding Pedestrian Environment
2.0 <- Totals	

Pedestrian Enhancing Infrastructure Measures (Non-Residential)

% Trips Reduced	Measure
2.0	Credit for Surrounding Pedestrian Environment
2.0 <- Totals	

Bicycle Enhancing Infratructure Measures (Residential)

% Trips Reduced	Measure
7.0	Credit for Surrounding Bicycle Environment
7.0 <- Totals	

Bike Enhancing Infrastructure Measures (Non-Residential)

% Trips Reduced	Measure
5.0	Credit for Surrounding Area Bike Environment
5.0 <- Totals	

Operational Measures (Applying to Commute Trips)

% Trips Reduced	Measure
0.0 <- Totals	

Operational Measures (Applying to Employee Non-Commute Trips)

% Trips Reduced	Measure
0.0 <- Totals	

Operational Measures (Applying to Customer Trips)

% Trips Reduced	Measure
0.0 <- Totals	

Measures Reducing VMT (Non-Residential)

VMT Reduced	Measure
0.0	Park and Ride Lots
0.0 <- Totals	

Measures Reducing VMT (Residential)

VMT Reduced	Measure
0.0 <- Totals	

Total Percentage Trip Reduction
with Environmental Factors and Mitigation Measures

Travel Mode	Home-Work Trips	Home-Shop Trips	Home-Other Trips
Pedestrian	0.04	0.18	0.18
Transit	0.52	0.11	0.14
Bicycle	1.40	1.40	1.40
Totals	0.00	0.00	0.00

Travel Mode	Work Trips	Employee Trips	Customer Trips
Pedestrian	0.04	0.40	0.40
Transit	0.52	0.01	0.52
Bicycle	1.00	1.00	1.00
Other	0.00	0.00	0.00
Totals	0.00	0.00	0.00

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

Phase 2 mitigation measure Soil Disturbance: Replace ground cover in disturbed areas quickly
has been changed from off to on.
Phase 2 mitigation measure Soil Disturbance: Water exposed surfaces - 2x daily
has been changed from off to on.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.

Changes made to the default values for Area

The wood stove option switch changed from on to off.
The fireplace percentage of residential units changed from 10 to 100.
The landscape year changed from 2004 to 2010.

Changes made to the default values for Operations

The operational emission year changed from 2004 to 2010.
The operational winter temperature changed from 40 to 30.
The operational winter selection item changed from 2 to 0.
The operational summer temperature changed from 60 to 90.
The operational summer selection item changed from 4 to 7.
The travel mode environment settings changed from both to: residential
The default/nodefault travel setting changed from nodefault to: default
Visually Interesting Uses: No Uses Within Walking Distance
changed to:Visually Interesting Uses: No Uses within Walking Distance

URBEMIS 2002 For Windows 7.4.2

File Name: I:\pdata\00000100\10P\WPWIN\EddieT\URBEMIS\URBEMIS2002\Moon Camp.urb
Project Name: Moon Camp
Project Location: Mountain Counties and Rural Counties
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: January, 2005
Construction Duration: 12
Total Land Use Area to be Developed: 18.4 acres
Maximum Acreage Disturbed Per Day: 4.5 acres
Single Family Units: 92 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source *** 2005***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.46	-	0.46
Off-Road Diesel	4.90	33.70	39.47	-	1.51	1.51	0.00
On-Road Diesel	0.09	1.84	0.34	0.03	0.05	0.04	0.01
Worker Trips	0.06	0.22	1.86	0.00	0.01	0.00	0.01
Maximum lbs/day	5.05	35.76	41.67	0.03	2.03	1.55	0.48
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	45.00	-	45.00
Off-Road Diesel	8.68	63.31	66.97	-	2.86	2.86	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.14	0.35	3.35	0.00	0.01	0.00	0.01
Maximum lbs/day	8.82	63.66	70.32	0.00	47.87	2.86	45.01
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	10.83	72.17	89.05	-	3.16	3.16	0.00
Bldg Const Worker Trips	0.47	0.28	6.19	0.00	0.10	0.00	0.10
Arch Coatings Off-Gas	375.99	-	-	-	-	-	-
Arch Coatings Worker Trips	0.47	0.28	6.19	0.00	0.10	0.00	0.10
Asphalt Off-Gas	0.60	-	-	-	-	-	-
Asphalt Off-Road Diesel	11.68	85.69	89.66	-	3.85	3.85	0.00
Asphalt On-Road Diesel	0.20	4.09	0.76	0.06	0.09	0.09	0.00
Asphalt Worker Trips	0.06	0.03	0.75	0.00	0.01	0.00	0.01
Maximum lbs/day	400.31	162.54	192.59	0.06	7.33	7.11	0.22
Max lbs/day all phases	400.31	162.54	192.59	0.06	52.12	7.11	45.01

Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Jan '05
Phase 1 Duration: 0.6 months
Building Volume Total (cubic feet): 10896
Building Volume Daily (cubic feet): 1089.6
On-Road Truck Travel (VMT): 60
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '05
Phase 2 Duration: 1.2 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Scrapers	313	0.660	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '05
Phase 3 Duration: 10.2 months
Start Month/Year for SubPhase Building: Feb '05
SubPhase Building Duration: 10.2 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Trenchers	82	0.695	8.0

Start Month/Year for SubPhase Architectural Coatings: Dec '05
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: Dec '05
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 2.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
1	Pavers	132	0.590	8.0
2	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0
1	Surfacing Equipment	437	0.490	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source *** 2005***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.46	-	0.46
Off-Road Diesel	4.90	33.70	39.47	-	1.51	1.51	0.00
On-Road Diesel	0.09	1.84	0.34	0.03	0.05	0.04	0.01
Worker Trips	0.06	0.22	1.86	0.00	0.01	0.00	0.01
Maximum lbs/day	5.05	35.76	41.67	0.03	2.03	1.55	0.48
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	13.30	-	13.30
Off-Road Diesel	8.68	63.31	66.97	-	2.86	2.86	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.14	0.35	3.35	0.00	0.01	0.00	0.01
Maximum lbs/day	8.82	63.66	70.32	0.00	16.17	2.86	13.31
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	10.83	72.17	89.05	-	3.16	3.16	0.00
Bldg Const Worker Trips	0.47	0.28	6.19	0.00	0.10	0.00	0.10
Arch Coatings Off-Gas	375.99	-	-	-	-	-	-
Arch Coatings Worker Trips	0.47	0.28	6.19	0.00	0.10	0.00	0.10
Asphalt Off-Gas	0.60	-	-	-	-	-	-
Asphalt Off-Road Diesel	11.68	85.69	89.66	-	3.85	3.85	0.00
Asphalt On-Road Diesel	0.20	4.09	0.76	0.06	0.09	0.09	0.00
Asphalt Worker Trips	0.06	0.03	0.75	0.00	0.01	0.00	0.01
Maximum lbs/day	400.31	162.54	192.59	0.06	7.33	7.11	0.22
Max lbs/day all phases	400.31	162.54	192.59	0.06	20.42	7.11	13.31

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 3.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Jan '05
Phase 1 Duration: 0.6 months
Building Volume Total (cubic feet): 10896
Building Volume Daily (cubic feet): 1089.6
On-Road Truck Travel (VMT): 60
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '05
Phase 2 Duration: 1.2 months

On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Scrapers	313	0.660	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '05
Phase 3 Duration: 10.2 months
Start Month/Year for SubPhase Building: Feb '05
SubPhase Building Duration: 10.2 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Trenchers	82	0.695	8.0

Start Month/Year for SubPhase Architectural Coatings: Dec '05
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: Dec '05
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 2.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
1	Pavers	132	0.590	8.0
2	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0
1	Surfacing Equipment	437	0.490	8.0

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.09	1.15	0.49	-	0.00
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.05	0.01	0.53	0.02	0.00
Consumer Prdcts	4.50	-	-	-	-
TOTALS(lbs/day,unmitigated)	4.64	1.17	1.02	0.02	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	9.15	10.57	119.16	0.09	14.26
TOTAL EMISSIONS (lbs/day)	9.15	10.57	119.16	0.09	14.26

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 90 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.57 trips / dwelling units	92.00	880.44

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

MITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	9.01	10.37	116.97	0.09	14.00
TOTAL EMISSIONS (lbs/day)	9.01	10.37	116.97	0.09	14.00

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 90 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.57 trips / dwelling units	92.00	880.44

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

ENVIRONMENTAL FACTORS APPLICABLE TO THE PROJECT

Pedestrian Environment

0.0 Side Walks/Paths: No Sidewalks
0.0 Street Trees Provide Shade: No Coverage
0.0 Pedestrian Circulation Access: No Destinations
0.0 Visually Interesting Uses: No Uses within Walking Distance
0.0 Street System Enhances Safety: No Streets
0.0 Pedestrian Safety from Crime: No Degree of Safety
0.0 Visually Interesting Walking Routes: No Visual Interest

3.8 <- Pedestrian Environmental Credit
3.8 /19 = 0.2 <- Pedestrian Effectiveness Factor

Transit Service

0.0 Transit Service: Dial-A-Ride or No Transit Service

0.0 <- Transit Effectiveness Credit
3.8 <- Pedestrian Factor
3.8 <-Total
3.8 /110 = 0.0 <-Transit Effectiveness Factor

Bicycle Environment

0.0 Interconnected Bikeways: No Bikeway Coverage
0.0 Bike Routes Provide Paved Shoulders: No Routes
0.0 Safe Vehicle Speed Limits: No Routes Provided
0.0 Safe School Routes: No Schools
0.0 Uses w/in Cycling Distance: No Uses w/in Cycling Distance
0.0 Bike Parking Ordinance: No Ordinance or Unenforceable

4.0 <- Bike Environmental Credit
4.0 /20 = 0.2 <- Bike Effectiveness Factor

MITIGATION MEASURES SELECTED FOR THIS PROJECT
(All mitigation measures are printed, even if
the selected land uses do not constitute a mixed use.)

Transit Infrastructure Measures

% Trips Reduced	Measure
15.0	Credit for Existing or Planned Community Transit Service
15.0 <- Totals	

Pedestrian Enhancing Infrastructure Measures (Residential)

% Trips Reduced	Measure
2.0	Credit for Surrounding Pedestrian Environment
2.0 <- Totals	

Pedestrian Enhancing Infrastructure Measures (Non-Residential)

% Trips Reduced	Measure
2.0	Credit for Surrounding Pedestrian Environment
2.0 <- Totals	

Bicycle Enhancing Infratructure Measures (Residential)

% Trips Reduced	Measure
7.0	Credit for Surrounding Bicycle Environment
7.0 <- Totals	

Bike Enhancing Infrastructure Measures (Non-Residential)

% Trips Reduced	Measure
5.0	Credit for Surrounding Area Bike Environment
5.0 <- Totals	

Operational Measures (Applying to Commute Trips)

% Trips Reduced	Measure
0.0 <- Totals	

Operational Measures (Applying to Employee Non-Commute Trips)

% Trips Reduced	Measure
0.0 <- Totals	

Operational Measures (Applying to Customer Trips)

% Trips Reduced	Measure
0.0 <- Totals	

Measures Reducing VMT (Non-Residential)

VMT Reduced	Measure
0.0	Park and Ride Lots
0.0 <- Totals	

Measures Reducing VMT (Residential)

VMT Reduced	Measure
0.0 <- Totals	

Total Percentage Trip Reduction
with Environmental Factors and Mitigation Measures

Travel Mode	Home-Work Trips	Home-Shop Trips	Home-Other Trips
Pedestrian	0.04	0.18	0.18
Transit	0.52	0.11	0.14
Bicycle	1.40	1.40	1.40
Totals	0.00	0.00	0.00

Travel Mode	Work Trips	Employee Trips	Customer Trips
Pedestrian	0.04	0.40	0.40
Transit	0.52	0.01	0.52
Bicycle	1.00	1.00	1.00
Other	0.00	0.00	0.00
Totals	0.00	0.00	0.00

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

Phase 2 mitigation measure Soil Disturbance: Replace ground cover in disturbed areas quickly
has been changed from off to on.
Phase 2 mitigation measure Soil Disturbance: Water exposed surfaces - 2x daily
has been changed from off to on.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.

Changes made to the default values for Area

The wood stove option switch changed from on to off.
The fireplace percentage of residential units changed from 10 to 100.
The landscape year changed from 2004 to 2010.

Changes made to the default values for Operations

The operational emission year changed from 2004 to 2010.
The operational winter temperature changed from 40 to 30.
The operational winter selection item changed from 2 to 0.
The operational summer temperature changed from 60 to 90.
The operational summer selection item changed from 4 to 7.
The travel mode environment settings changed from both to: residential
The default/nodefault travel setting changed from nodefault to: default
Visually Interesting Uses: No Uses Within Walking Distance
changed to:Visually Interesting Uses: No Uses within Walking Distance

URBEMIS 2002 For Windows 7.4.2

File Name: I:\pdata\00000100\10P\WPWIN\EddieT\URBEMIS\URBEMIS2002\Moon Camp.urb
Project Name: Moon Camp
Project Location: Mountain Counties and Rural Counties
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Tons/Year)

Construction Start Month and Year: January, 2005
Construction Duration: 12
Total Land Use Area to be Developed: 18.4 acres
Maximum Acreage Disturbed Per Day: 4.5 acres
Single Family Units: 92 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (tons/year)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2005***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.03	0.22	0.26	-	0.01	0.01	0.00
On-Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Total tons/year	0.03	0.23	0.27	0.00	0.03	0.01	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.60	-	0.60
Off-Road Diesel	0.12	0.84	0.88	-	0.04	0.04	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00
Total tons/year	0.12	0.84	0.92	0.00	2.52	0.04	0.60
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	1.22	8.06	10.00	-	0.31	0.31	0.00
Bldg Const Worker Trips	0.04	0.00	0.65	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	4.14	-	-	-	-	-	-
Arch Coatings Worker Trips	0.01	0.00	0.07	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.06	0.47	0.49	-	0.02	0.02	0.00
Asphalt On-Road Diesel	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons/year	5.47	8.55	11.21	0.00	2.54	0.33	0.00
Total all phases tons/yr	5.62	9.62	12.40	0.00	5.09	0.38	0.60

Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Jan '05
Phase 1 Duration: 0.6 months
Building Volume Total (cubic feet): 10896
Building Volume Daily (cubic feet): 1089.6
On-Road Truck Travel (VMT): 60
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '05
Phase 2 Duration: 1.2 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Scrapers	313	0.660	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '05
Phase 3 Duration: 10.2 months
Start Month/Year for SubPhase Building: Feb '05
SubPhase Building Duration: 10.2 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Trenchers	82	0.695	8.0

Start Month/Year for SubPhase Architectural Coatings: Dec '05
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: Dec '05
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 2.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
1	Pavers	132	0.590	8.0
2	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0
1	Surfacing Equipment	437	0.490	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (tons/year)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2005***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.03	0.22	0.26	-	0.01	0.01	0.00
On-Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Total tons/year	0.03	0.23	0.27	0.00	0.03	0.01	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.18	-	0.18
Off-Road Diesel	0.12	0.84	0.88	-	0.04	0.04	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00
Total tons/year	0.12	0.84	0.92	0.00	0.84	0.04	0.18
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	1.22	8.06	10.00	-	0.31	0.31	0.00
Bldg Const Worker Trips	0.04	0.00	0.65	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	4.14	-	-	-	-	-	-
Arch Coatings Worker Trips	0.01	0.00	0.07	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.06	0.47	0.49	-	0.02	0.02	0.00
Asphalt On-Road Diesel	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons/year	5.47	8.55	11.21	0.00	2.54	0.33	0.00
Total all phases tons/yr	5.62	9.62	12.40	0.00	3.41	0.38	0.18

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 3.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Jan '05
Phase 1 Duration: 0.6 months
Building Volume Total (cubic feet): 10896
Building Volume Daily (cubic feet): 1089.6
On-Road Truck Travel (VMT): 60
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '05
Phase 2 Duration: 1.2 months

On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Graders	174	0.575	8.0
1	Off Highway Tractors	255	0.410	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Scrapers	313	0.660	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '05
Phase 3 Duration: 10.2 months
Start Month/Year for SubPhase Building: Feb '05
SubPhase Building Duration: 10.2 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Tractors	255	0.410	8.0
2	Off Highway Trucks	417	0.490	8.0
1	Rough Terrain Forklifts	94	0.475	8.0
1	Trenchers	82	0.695	8.0

Start Month/Year for SubPhase Architectural Coatings: Dec '05
SubPhase Architectural Coatings Duration: 1 months
Start Month/Year for SubPhase Asphalt: Dec '05
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 2.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
1	Pavers	132	0.590	8.0
2	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0
1	Surfacing Equipment	437	0.490	8.0

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.02	0.21	0.09	-	0.00
Wood Stoves	0.00	0.00	0.00	0.00	0.00
Fireplaces	42.25	0.48	46.60	0.07	6.38
Landscaping	0.00	0.00	0.05	0.00	0.00
Consumer Prdcts	0.82	-	-	-	-
TOTALS (tpy, unmitigated)	43.09	0.69	46.74	0.08	6.38

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.73	2.34	22.27	0.02	2.60
TOTAL EMISSIONS (tons/yr)	1.73	2.34	22.27	0.02	2.60

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 90 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.57 trips / dwelling units	92.00	880.44

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

MITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	1.70	2.30	21.86	0.02	2.55
TOTAL EMISSIONS (tons/yr)	1.70	2.30	21.86	0.02	2.55

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 90 Season: Annual

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Single family housing	9.57 trips / dwelling units	92.00	880.44

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

ENVIRONMENTAL FACTORS APPLICABLE TO THE PROJECT

Pedestrian Environment

```
 0.0            Side Walks/Paths: No Sidewalks
 0.0            Street Trees Provide Shade: No Coverage
 0.0            Pedestrian Circulation Access: No Destinations
 0.0            Visually Interesting Uses: No Uses within Walking Distance
 0.0            Street System Enhances Safety: No Streets
 0.0            Pedestrian Safety from Crime: No Degree of Safety
 0.0            Visually Interesting Walking Routes: No Visual Interest

 3.8    <- Pedestrian Environmental Credit
 3.8   /19 =  0.2    <- Pedestrian Effectiveness Factor
```

Transit Service

```
 0.0            Transit Service: Dial-A-Ride or No Transit Service

 0.0    <- Transit Effectiveness Credit
 3.8    <- Pedestrian Factor
 3.8    <-Total
 3.8    /110 =  0.0     <-Transit Effectiveness Factor
```

Bicycle Environment

```
 0.0            Interconnected Bikeways: No Bikeway Coverage
 0.0            Bike Routes Provide Paved Shoulders: No Routes
 0.0            Safe Vehicle Speed Limits: No Routes Provided
 0.0            Safe School Routes: No Schools
 0.0            Uses w/in Cycling Distance: No Uses w/in Cycling Distance
 0.0            Bike Parking Ordinance: No Ordinance or Unenforceable

 4.0    <- Bike Environmental Credit
 4.0  /20 =  0.2    <- Bike Effectiveness Factor
```

MITIGATION MEASURES SELECTED FOR THIS PROJECT
(All mitigation measures are printed, even if
the selected land uses do not constitute a mixed use.)

Transit Infrastructure Measures

% Trips Reduced	Measure
15.0	Credit for Existing or Planned Community Transit Service
15.0 <- Totals	

Pedestrian Enhancing Infrastructure Measures (Residential)

% Trips Reduced	Measure
2.0	Credit for Surrounding Pedestrian Environment
2.0 <- Totals	

Pedestrian Enhancing Infrastructure Measures (Non-Residential)

% Trips Reduced	Measure
2.0	Credit for Surrounding Pedestrian Environment
2.0 <- Totals	

Bicycle Enhancing Infratructure Measures (Residential)

% Trips Reduced	Measure
7.0	Credit for Surrounding Bicycle Environment
7.0 <- Totals	

Bike Enhancing Infrastructure Measures (Non-Residential)

% Trips Reduced	Measure
5.0	Credit for Surrounding Area Bike Environment
5.0 <- Totals	

Operational Measures (Applying to Commute Trips)

% Trips Reduced	Measure
0.0 <- Totals	

Operational Measures (Applying to Employee Non-Commute Trips)

% Trips Reduced	Measure
0.0 <- Totals	

Operational Measures (Applying to Customer Trips)

% Trips Reduced	Measure
0.0 <- Totals	

Measures Reducing VMT (Non-Residential)

VMT Reduced	Measure
0.0	Park and Ride Lots
0.0 <- Totals	

Measures Reducing VMT (Residential)

VMT Reduced	Measure
0.0 <- Totals	

Total Percentage Trip Reduction
with Environmental Factors and Mitigation Measures

Travel Mode	Home-Work Trips	Home-Shop Trips	Home-Other Trips
Pedestrian	0.04	0.18	0.18
Transit	0.52	0.11	0.14
Bicycle	1.40	1.40	1.40
Totals	0.00	0.00	0.00

Travel Mode	Work Trips	Employee Trips	Customer Trips
Pedestrian	0.04	0.40	0.40
Transit	0.52	0.01	0.52
Bicycle	1.00	1.00	1.00
Other	0.00	0.00	0.00
Totals	0.00	0.00	0.00

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

Phase 2 mitigation measure Soil Disturbance: Replace ground cover in disturbed areas quickly
has been changed from off to on.
Phase 2 mitigation measure Soil Disturbance: Water exposed surfaces - 2x daily
has been changed from off to on.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.

Changes made to the default values for Area

The wood stove option switch changed from on to off.
The fireplace percentage of residential units changed from 10 to 100.
The landscape year changed from 2004 to 2010.

Changes made to the default values for Operations

The operational emission year changed from 2004 to 2010.
The operational winter temperature changed from 40 to 30.
The operational winter selection item changed from 2 to 0.
The operational summer temperature changed from 60 to 90.
The operational summer selection item changed from 4 to 7.
The travel mode environment settings changed from both to: residential
The default/nodefault travel setting changed from nodefault to: default
Visually Interesting Uses: No Uses Within Walking Distance
changed to:Visually Interesting Uses: No Uses within Walking Distance

15.5 Noise Data

Picture of Location

Site Number: 1	Date: 1/23/02	By: Mike Harden
Time: 10:15 am to 10:35 am		JN 10-101901 - Moon
General Location: end of cul-de-sac on Flicker Drive.		
Noise Readings	Conditions: Variable Winds, Clear/Sunny, 15°	
LEQ = 57.3 dBA		
LDN-a = 57.3 dBA	S CNEL = 57.3 dBA	
LDL-a: LEQ = 57.3 dBA	TH 20 EXRT 3 dBA	
Ln-a L(5) = 64.3 dBA	Slow L (10) = 56.5 dBA	
Source of Peak Noise: Automobile		
Setback Distance		
Medians:	Sidewalks:	
Roadway:	Bicycle:	
Orientation and Type of Sensitive Receptor:	Direction:	
	Setbacks from ROW (feet):	
Noise Attenuation Measures: (include approx. height of sound walls)		

Directions:
1. Mount noise meter to tri-pod.
2. Turn On (lower left button) - wait for "S" to stop blinking.
3. Press "Leq"
4. Press "R/S"
5. Let stand for noise reading to occur (10-30 min.) Be QUIET
6. Press "R/S"
7. Write down noise readings (Starts with LEQ)
8. Press "Shift", then press "Ldn"- Write down noise reading.
9. Press "Shift", then press "LDL"- Write down noise reading.
10. Press "Shift", then press "Lmin"- Write down noise reading.
11. Press "Lmax"- Write down noise reading.
12. Press "PEAK" - Write down noise reading.
13. Press "Ln" - Write down noise reading.
14. Press "Shift", then Press "Reset"
15. Press "Reset" again. Go to next site. (Start at #3)

Picture of Location

Site Number: 2	Date: 1/23/02	By: Mike Harden
Time: 10:55 am to 11:20 am		Jn 10-101901 Moon Camp
General Location: Oriole Drive, near N. Shore Drive		
Noise Readings	Conditions: Variable Winds, Clear/Sunny, 15°	
LEQ = 59.3 dBA		
LDN-a = 59.3 dBA	S CNEL = 62.8 dBA	
LDL-a: LEQ = 59.2 dBA	TH 20 EXRT 3 dBA	
Ln-a L(5) = 65.1 dBA	Slow L (10) = 63.3 dBA	
Source of Peak Noise: Truck		
Setback Distance		
Medians:	Sidewalks:	
Roadway:	Bicycle:	
Orientation and Type of Sensitive Receptor:	Direction:	
	Setbacks from ROW (feet):	
Noise Attenuation Measures: (include approx. height of sound walls)		

Directions:
1. Mount noise meter to tri-pod.
2. Turn On (lower left button) - wait for "S" to stop blinking.
3. Press "Leq"
4. Press "R/S"
5. Let stand for noise reading to occur (10-30 min.) Be QUIET
6. Press "R/S"
7. Write down noise readings (Starts with LEQ)
8. Press "Shift", then press "Ldn"- Write down noise reading.
9. Press "Shift", then press "LDL"- Write down noise reading.
10. Press "Shift", then press "Lmin"- Write down noise reading.
11. Press "Lmax"- Write down noise reading.
12. Press "PEAK" - Write down noise reading.
13. Press "Ln" - Write down noise reading.
14. Press "Shift", then Press "Reset"
15. Press "Reset" again. Go to next site. (Start at #3)

Site Number: 3	Date: 1/23/02	By: Mike Harden
Time: 11:35 am to 11:55 am	Jn 10-101901 Moon Camp	
General Location: N. Shore Drive, eastern portion of site, on loop		
Noise Readings	Conditions: Variable Winds, Clear/Sunny, 15°	
LEQ = 66.6 dBA		
LDN-a = 66.6 dBA	S CNEL = 71.4 dBA	
LDL-a: LEQ = 66.6 dBA	TH 20 EXRT 3 dBA	
Source of Peak Noise: Truck		
Setback Distance		
Medians:	Sidewalks:	
Roadway:	Bicycle:	
Orientation and Type of Sensitive Receptor:	Direction:	
	Setbacks from ROW (feet):	
Noise Attenuation Measures: (include approx. height of sound walls)		

Directions:
1. Mount noise meter to tri-pod.
2. Turn On (lower left button) - wait for "S" to stop blinking.
3. Press "Leq"
4. Press "R/S"
5. Let stand for noise reading to occur (10-30 min.) Be QUIET
6. Press "R/S"
7. Write down noise readings (Starts with LEQ)
8. Press "Shift", then press "Ldn"- Write down noise reading.
9. Press "Shift", then press "LDL"- Write down noise reading.
10. Press "Shift", then press "Lmin"- Write down noise reading.
11. Press "Lmax"- Write down noise reading.
12. Press "PEAK" - Write down noise reading.
13. Press "Ln" - Write down noise reading.
14. Press "Shift", then Press "Reset"
15. Press "Reset" again. Go to next site. (Start at #3)

Picture of Location

Site Number: 4	Date: 1/23/02	By: Mike Harden
Time: 1:20 pm to 1:40 pm	JN 10-101901 Moon Camp	
General Location: Moon Lane		
Noise Readings	Conditions: Variable Winds, Clear/Sunny, 15°	
LEQ = 63.8 dBA		
LDN-a = 63.8 dBA	S CNEL = 68.5 dBA	
LDL-a: LEQ = 63.8 dBA	TH 20 EXRT 3 dBA	
Ln-a L(5) = 71.5 dBA	Slow L (10) = 68.7 dBA	
Source of Peak Noise: Truck		
Setback Distance		
Medians:	Sidewalks:	
Roadway:	Bicycle:	
Orientation and Type of Sensitive Receptor:	Direction:	
	Setbacks from ROW (feet):	
Noise Attenuation Measures: (include approx. height of sound walls)		

Directions:
1. Mount noise meter to tri-pod.
2. Turn On (lower left button) - wait for "S" to stop blinking.
3. Press "Leq"
4. Press "R/S"
5. Let stand for noise reading to occur (10-30 min.) Be QUIET
6. Press "R/S"
7. Write down noise readings (Starts with LEQ)
8. Press "Shift", then press "Ldn"- Write down noise reading.
9. Press "Shift", then press "LDL"- Write down noise reading.
10. Press "Shift", then press "Lmin"- Write down noise reading.
11. Press "Lmax"- Write down noise reading.
12. Press "PEAK" - Write down noise reading.
13. Press "Ln" - Write down noise reading.
14. Press "Shift", then Press "Reset"
15. Press "Reset" again. Go to next site. (Start at #3)

Picture of Location

North Shore Drive: West of Stanfield Cutoff: Existing

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**13**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the	100	
		nearest lane centerline (>50')		
		(used in calculations)		
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**57.17**	
VOL		TOTAL Vehicle Volume (two-way)	**4,750**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
106	70	**<-- hard 60 CNEL soft --->**	**69**	**33**
34	-3	**65 CNEL**	**32**	**-4**
11	-26	**70 CNEL**	**15**	**-21**

View	View Angle of Observer (180)	180	
	SHIELDING (adjust output by hand)		
	~~		
Woods	Thickness of woodland between observer and road (feet)	0	
Cover	Percent view coverage between observer and road (0-100)	0	
Rows	Building rows between observer and roadway (0-4).	0	

North Shore Drive: West of Stanfield Cutoff: 2006 - Without Project

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**13**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the	100	
		nearest lane centerline (>50')		
		(used in calculations)		
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**57.38**	
VOL		TOTAL Vehicle Volume (two-way)	**4,988**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
112	75	**<-- hard 60 CNEL soft --->**	**71**	**35**
35	-1	**65 CNEL**	**33**	**-3**
11	-25	**70 CNEL**	**15**	**-21**

View	View Angle of Observer (180)	180	
	SHIELDING (adjust output by hand)		
	~~		
Woods	Thickness of woodland between observer and road (feet)	0	
Cover	Percent view coverage between observer and road (0-100)	0	
Rows	Building rows between observer and roadway (0-4).	0	

North Shore Drive: West of Stanfield Cutoff: 2006 - With Project

Speed			Vehicle Speed (mph, 0 to 100)	40
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	**57.92**
VOL			TOTAL Vehicle Volume (two-way)	**5,655**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
127	90	**<-- hard 60 CNEL soft --->**	**77**	**41**
40	4	**65 CNEL**	**36**	**-0**
13	-24	**70 CNEL**	**17**	**-20**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

North Shore Drive: West of Stanfield Cutoff: 2025 Without Project

Speed			Vehicle Speed (mph, 0 to 100)	40
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	**58.1**
VOL			TOTAL Vehicle Volume (two-way)	**5,890**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
132	95	**<-- hard 60 CNEL soft --->**	**79**	**43**
42	5	**65 CNEL**	**37**	**1**
13	-23	**70 CNEL**	**17**	**-19**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

North Shore Drive: West of Stanfield Cutoff: 2025 - With Project

Speed			Vehicle Speed (mph, 0 to 100)	40
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	**58.57**
VOL			TOTAL Vehicle Volume (two-way)	**6,557**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM Centerline	DISTANCE FROM ROW
147	110	<-- hard **60 CNEL** soft --->	**85**	**49**
46	10	**65 CNEL**	**40**	**3**
15	-22	**70 CNEL**	**18**	**-18**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

North Shore Drive: East of Stanfield Cutoff: Existing

Speed			Vehicle Speed (mph, 0 to 100)	40
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	**54.24**
VOL			TOTAL Vehicle Volume (two-way)	**2,420**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM Centerline	DISTANCE FROM ROW
54	18	<-- hard **60 CNEL** soft --->	**44**	**8**
17	-19	**65 CNEL**	**20**	**-16**
5	-31	**70 CNEL**	**9**	**-27**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

North Shore Drive: East of Stanfield Cutoff: 2006 - Without Project

Speed			Vehicle Speed (mph, 0 to 100)	40
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the	100
			nearest lane centerline (>50')	
			(used in calculations)	
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	59
VOL			TOTAL Vehicle Volume (two-way)	7,245
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
162	126	**<-- hard 60 CNEL soft --->**	**91**	**55**
51	15	**65 CNEL**	**42**	**6**
16	-20	**70 CNEL**	**20**	**-17**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between	0
		observer and road (feet)	
Cover		Percent view coverage between	0
		observer and road (0-100)	
Rows		Building rows between observer	0
		and roadway (0-4).	

North Shore Drive: East of Stanfield Cutoff: 2006 - With Project

Speed			Vehicle Speed (mph, 0 to 100)	40
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the	100
			nearest lane centerline (>50')	
			(used in calculations)	
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	59
VOL			TOTAL Vehicle Volume (two-way)	7,245
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
162	126	**<-- hard 60 CNEL soft --->**	**91**	**55**
51	15	**65 CNEL**	**42**	**6**
16	-20	**70 CNEL**	**20**	**-17**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between	0
		observer and road (feet)	
Cover		Percent view coverage between	0
		observer and road (0-100)	
Rows		Building rows between observer	0
		and roadway (0-4).	

North Shore Drive: East of Stanfield Cutoff: 2025 - Without Project

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**13**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the	100	
		nearest lane centerline (>50')		
		(used in calculations)		
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**59.72**	
VOL		TOTAL Vehicle Volume (two-way)	**8,556**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
191	155	**<-- hard 60 CNEL soft --->**	**102**	**66**
60	24	**65 CNEL**	**47**	**11**
19	-17	**70 CNEL**	**22**	**-14**

View		View Angle of Observer (180)	180	
		SHIELDING (adjust output by hand)		
		~~		
Woods		Thickness of woodland between	0	
		observer and road (feet)		
Cover		Percent view coverage between	0	
		observer and road (0-100)		
Rows		Building rows between observer	0	
		and roadway (0-4).		

North Shore Drive: East of Stanfield Cutoff: 2025 - With Project

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**13**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the	100	
		nearest lane centerline (>50')		
		(used in calculations)		
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**59.72**	
VOL		TOTAL Vehicle Volume (two-way)	**8,556**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
191	155	**<-- hard 60 CNEL soft --->**	**102**	**66**
60	24	**65 CNEL**	**47**	**11**
19	-17	**70 CNEL**	**22**	**-14**

View		View Angle of Observer (180)	180	
		SHIELDING (adjust output by hand)		
		~~		
Woods		Thickness of woodland between	0	
		observer and road (feet)		
Cover		Percent view coverage between	0	
		observer and road (0-100)		
Rows		Building rows between observer	0	
		and roadway (0-4).		

Stanfield Cutoff: North of N. Shore Drive: Existing

Speed			Vehicle Speed (mph, 0 to 100)	15
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	**32.22**
VOL			TOTAL Vehicle Volume (two-way)	**125**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
0	-36	**<-- hard 60 CNEL soft --->**	**2**	**-35**
0	-36	**65 CNEL**	**1**	**-36**
0	-36	**70 CNEL**	**0**	**-36**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: North of N. Shore Drive: 2006 - Without Project

Speed			Vehicle Speed (mph, 0 to 100)	15
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	**32.42**
VOL			TOTAL Vehicle Volume (two-way)	**131**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
0	-36	**<-- hard 60 CNEL soft --->**	**2**	**-35**
0	-36	**65 CNEL**	**1**	**-36**
0	-36	**70 CNEL**	**0**	**-36**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: North of N. Shore Drive: 2006 - With Project

Speed			Vehicle Speed (mph, 0 to 100)	15
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	32.42
VOL			TOTAL Vehicle Volume (two-way)	131
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
0	-36	**<-- hard 60 CNEL soft --->**	**2**	**-35**
0	-36	**65 CNEL**	**1**	**-36**
0	-36	**70 CNEL**	**0**	**-36**

View	View Angle of Observer (180)	180
	SHIELDING (adjust output by hand)	
	~~	
Woods	Thickness of woodland between observer and road (feet)	0
Cover	Percent view coverage between observer and road (0-100)	0
Rows	Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: North of N. Shore Drive: 2025 - Without Project

Speed			Vehicle Speed (mph, 0 to 100)	15
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	33.16
VOL			TOTAL Vehicle Volume (two-way)	155
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
0	-36	**<-- hard 60 CNEL soft --->**	**2**	**-35**
0	-36	**65 CNEL**	**1**	**-36**
0	-36	**70 CNEL**	**0**	**-36**

View	View Angle of Observer (180)	180
	SHIELDING (adjust output by hand)	
	~~	
Woods	Thickness of woodland between observer and road (feet)	0
Cover	Percent view coverage between observer and road (0-100)	0
Rows	Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: North of N. Shore Drive: 2025 - With Project

Speed			Vehicle Speed (mph, 0 to 100)	**15**
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	**13**
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	**30**
			*** CNEL @ 100' **(SOFT)**	**33.16**
VOL			TOTAL Vehicle Volume (two-way)	**155**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
0	-36	**<-- hard 60 CNEL soft --->**	**2**	**-35**
0	-36	**65 CNEL**	**1**	**-36**
0	-36	**70 CNEL**	**0**	**-36**

View	View Angle of Observer (180)	180
	SHIELDING (adjust output by hand)	
	~~	
Woods	Thickness of woodland between observer and road (feet)	0
Cover	Percent view coverage between observer and road (0-100)	0
Rows	Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: N. Shore Drive to Big Bear Blvd.: Existing

Speed			Vehicle Speed (mph, 0 to 100)	**40**
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	**13**
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	**30**
			*** CNEL @ 100' **(SOFT)**	**57.9**
VOL			TOTAL Vehicle Volume (two-way)	**5,625**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
126	89	**<-- hard 60 CNEL soft --->**	**77**	**41**
40	3	**65 CNEL**	**36**	**-1**
13	-24	**70 CNEL**	**17**	**-20**

View	View Angle of Observer (180)	180
	SHIELDING (adjust output by hand)	
	~~	
Woods	Thickness of woodland between observer and road (feet)	0
Cover	Percent view coverage between observer and road (0-100)	0
Rows	Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: N. Shore Drive to Big Bear Blvd.: 2006 - Without Project

Speed			Vehicle Speed (mph, 0 to 100)	40
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the	100
			nearest lane centerline (>50')	
			(used in calculations)	
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	**58.11**
VOL			TOTAL Vehicle Volume (two-way)	**5,906**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
132	96	**<-- hard 60 CNEL soft --->**	**80**	**43**
42	5	**65 CNEL**	**37**	**1**
13	-23	**70 CNEL**	**17**	**-19**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: N. Shore Drive to Big Bear Blvd.: 2006 - With Project

Speed			Vehicle Speed (mph, 0 to 100)	40
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	13
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the	100
			nearest lane centerline (>50')	
			(used in calculations)	
Dist2			Dist. from ROW to NLC	30
			*** CNEL @ 100' **(SOFT)**	**58.58**
VOL			TOTAL Vehicle Volume (two-way)	**6,573**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
147	111	**<-- hard 60 CNEL soft --->**	**86**	**49**
47	10	**65 CNEL**	**40**	**3**
15	-22	**70 CNEL**	**18**	**-18**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: N. Shore Drive to Big Bear Blvd.: 2025 -Without Project

//	Speed		Vehicle Speed (mph, 0 to 100)	**40**
//	Grad		Road Gradient (%, 0 to 6)	
//	Sep1		Centerline Separation (feet)	**13**
//	with	>>	(Usually 23' for 2-lane, 38'	
//	median	>>	for 4-lane, 50' for 6-lane)	
//	Dist1		Distance from observer to the	100
//			nearest lane centerline (>50')	
//			(used in calculations)	
//	Dist2		Dist. from ROW to NLC	**30**
//			*** CNEL @ 100' **(SOFT)**	**58.83**
//	VOL		TOTAL Vehicle Volume (two-way)	**6,975**
//	ALPHA		Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
156	120	**<-- hard 60 CNEL soft --->**	**89**	**53**
49	13	**65 CNEL**	**41**	**5**
16	-21	**70 CNEL**	**19**	**-17**

//	View		View Angle of Observer (180)	180
//			SHIELDING (adjust output by hand)	
//			~~~~~~~~~~	
//	Woods		Thickness of woodland between observer and road (feet)	0
//	Cover		Percent view coverage between observer and road (0-100)	0
//	Rows		Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: N. Shore Drive to Big Bear Blvd.: 2025 - With Project

//	Speed		Vehicle Speed (mph, 0 to 100)	**40**
//	Grad		Road Gradient (%, 0 to 6)	
//	Sep1		Centerline Separation (feet)	**13**
//	with	>>	(Usually 23' for 2-lane, 38'	
//	median	>>	for 4-lane, 50' for 6-lane)	
//	Dist1		Distance from observer to the	100
//			nearest lane centerline (>50')	
//			(used in calculations)	
//	Dist2		Dist. from ROW to NLC	**30**
//			*** CNEL @ 100' **(SOFT)**	**59.23**
//	VOL		TOTAL Vehicle Volume (two-way)	**7,642**
//	ALPHA		Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
171	135	**<-- hard 60 CNEL soft --->**	**94**	**58**
54	18	**65 CNEL**	**44**	**8**
17	-19	**70 CNEL**	**20**	**-16**

//	View		View Angle of Observer (180)	180
//			SHIELDING (adjust output by hand)	
//			~~~~~~~~~~	
//	Woods		Thickness of woodland between observer and road (feet)	0
//	Cover		Percent view coverage between observer and road (0-100)	0
//	Rows		Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: South of Big Bear Blvd.: Existing

Speed			Vehicle Speed (mph, 0 to 100)	**25**
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	**13**
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	**30**
			*** CNEL @ 100' **(SOFT)**	**49.15**
VOL			TOTAL Vehicle Volume (two-way)	**2,250**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
17	-20	**<-- hard 60 CNEL soft --->**	**20**	**-16**
5	-31	**65 CNEL**	**9**	**-27**
2	-35	**70 CNEL**	**4**	**-32**

View	View Angle of Observer (180)	180
	SHIELDING (adjust output by hand)	
	~~	
Woods	Thickness of woodland between observer and road (feet)	0
Cover	Percent view coverage between observer and road (0-100)	0
Rows	Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: South of Big Bear Blvd.: 2006 - Without Project

Speed			Vehicle Speed (mph, 0 to 100)	**25**
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	**13**
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the nearest lane centerline (>50') (used in calculations)	100
Dist2			Dist. from ROW to NLC	**30**
			*** CNEL @ 100' **(SOFT)**	**49.36**
VOL			TOTAL Vehicle Volume (two-way)	**2,363**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
18	-19	**<-- hard 60 CNEL soft --->**	**21**	**-16**
6	-31	**65 CNEL**	**10**	**-27**
2	-35	**70 CNEL**	**4**	**-32**

View	View Angle of Observer (180)	180
	SHIELDING (adjust output by hand)	
	~~	
Woods	Thickness of woodland between observer and road (feet)	0
Cover	Percent view coverage between observer and road (0-100)	0
Rows	Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: South of Big Bear Blvd.: 2006 - With Project

Speed			Vehicle Speed (mph, 0 to 100)	**25**
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	**13**
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the	100
			nearest lane centerline (>50')	
			(used in calculations)	
Dist2			Dist. from ROW to NLC	**30**
			*** CNEL @ 100' **(SOFT)**	**49.36**
VOL			TOTAL Vehicle Volume (two-way)	**2,363**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
18	-19	**<-- hard 60 CNEL soft --->**	**21**	**-16**
6	-31	**65 CNEL**	**10**	**-27**
2	-35	**70 CNEL**	4	**-32**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: South of Big Bear Blvd.: 2025 - Without Project

Speed			Vehicle Speed (mph, 0 to 100)	**25**
Grad			Road Gradient (%, 0 to 6)	
Sep1			Centerline Separation (feet)	**13**
	with	>>	(Usually 23' for 2-lane, 38'	
	median	>>	for 4-lane, 50' for 6-lane)	
Dist1			Distance from observer to the	100
			nearest lane centerline (>50')	
			(used in calculations)	
Dist2			Dist. from ROW to NLC	**30**
			*** CNEL @ 100' **(SOFT)**	**50.09**
VOL			TOTAL Vehicle Volume (two-way)	**2,790**
ALPHA			Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
21	-15	**<-- hard 60 CNEL soft --->**	**23**	**-13**
7	-30	**65 CNEL**	**11**	**-26**
2	-34	**70 CNEL**	**5**	**-31**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Stanfield Cutoff: South of Big Bear Blvd.: 2025 - With Project

//	Speed		Vehicle Speed (mph, 0 to 100)	**25**
//	Grad		Road Gradient (%, 0 to 6)	
//	Sep1		Centerline Separation (feet)	**13**
//	with	>>	(Usually 23' for 2-lane, 38'	
//	median	>>	for 4-lane, 50' for 6-lane)	
//	Dist1		Distance from observer to the	100
//			nearest lane centerline (>50')	
//			(used in calculations)	
//	Dist2		Dist. from ROW to NLC	**30**
//			*** CNEL @ 100' **(SOFT)**	**50.09**
//	VOL		TOTAL Vehicle Volume (two-way)	**2,790**
//	ALPHA		Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
21	-15	**<-- hard 60 CNEL soft --->**	**23**	**-13**
7	-30	**65 CNEL**	**11**	**-26**
2	-34	**70 CNEL**	**5**	**-31**

//	View	View Angle of Observer (180)	180
//		SHIELDING (adjust output by hand)	
//		~~~~~~~~~	
//	Woods	Thickness of woodland between observer and road (feet)	0
//	Cover	Percent view coverage between observer and road (0-100)	0
//	Rows	Building rows between observer and roadway (0-4).	0

Big Bear Blvd.: West of Stanfield Cutoff - Existing

//	Speed		Vehicle Speed (mph, 0 to 100)	**40**
//	Grad		Road Gradient (%, 0 to 6)	
//	Sep1		Centerline Separation (feet)	**38**
//	with	>>	(Usually 23' for 2-lane, 38'	
//	median	>>	for 4-lane, 50' for 6-lane)	
//	Dist1		Distance from observer to the	100
//			nearest lane centerline (>50')	
//			(used in calculations)	
//	Dist2		Dist. from ROW to NLC	**30**
//			*** CNEL @ 100' **(SOFT)**	**62.87**
//	VOL		TOTAL Vehicle Volume (two-way)	**20,500**
//	ALPHA		Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
458	411	**<-- hard 60 CNEL soft --->**	**183**	**135**
145	97	**65 CNEL**	**85**	**37**
46	-2	**70 CNEL**	**39**	**-8**

//	View	View Angle of Observer (180)	180
//		SHIELDING (adjust output by hand)	
//		~~~~~~~~~	
//	Woods	Thickness of woodland between observer and road (feet)	0
//	Cover	Percent view coverage between observer and road (0-100)	0
//	Rows	Building rows between observer and roadway (0-4).	0

Big Bear Blvd.: West of Stanfield Cutoff - 2006 - Without Project

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**38**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the	100	
		nearest lane centerline (>50')		
		(used in calculations)		
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**63.08**	
VOL		TOTAL Vehicle Volume (two-way)	**21,525**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
482	434	**<-- hard 60 CNEL soft --->**	**188**	**141**
152	105	**65 CNEL**	**88**	**40**
48	1	**70 CNEL**	**41**	**-7**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Big Bear Blvd.: West of Stanfield Cutoff - 2006 - With Project

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**38**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the	100	
		nearest lane centerline (>50')		
		(used in calculations)		
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**63.13**	
VOL		TOTAL Vehicle Volume (two-way)	**21,792**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
487	440	**<-- hard 60 CNEL soft --->**	**190**	**142**
154	107	**65 CNEL**	**88**	**41**
49	1	**70 CNEL**	**41**	**-7**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Big Bear Blvd.: West of Stanfield Cutoff - 2025 - Without Project

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**38**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the	100	
		nearest lane centerline (>50')		
		(used in calculations)		
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**63.8**	
VOL		TOTAL Vehicle Volume (two-way)	**25,420**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
569	521	**<-- hard 60 CNEL soft --->**	**211**	**163**
180	132	**65 CNEL**	**98**	**50**
57	9	**70 CNEL**	**45**	**-2**

View	View Angle of Observer (180)	180	
	SHIELDING (adjust output by hand)		
	~~		
Woods	Thickness of woodland between observer and road (feet)	0	
Cover	Percent view coverage between observer and road (0-100)	0	
Rows	Building rows between observer and roadway (0-4).	0	

Big Bear Blvd.: West of Stanfield Cutoff - 2025 - With Project

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**38**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the	100	
		nearest lane centerline (>50')		
		(used in calculations)		
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**63.85**	
VOL		TOTAL Vehicle Volume (two-way)	**25,687**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
574	527	**<-- hard 60 CNEL soft --->**	**212**	**165**
182	134	**65 CNEL**	**98**	**51**
57	10	**70 CNEL**	**46**	**-2**

View	View Angle of Observer (180)	180	
	SHIELDING (adjust output by hand)		
	~~		
Woods	Thickness of woodland between observer and road (feet)	0	
Cover	Percent view coverage between observer and road (0-100)	0	
Rows	Building rows between observer and roadway (0-4).	0	

Big Bear Blvd.: East of Stanfield Cutoff - Existing

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**38**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the nearest lane centerline (>50') (used in calculations)	100	
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**62.32**	
VOL		TOTAL Vehicle Volume (two-way)	**18,100**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
405	357	**<-- hard 60 CNEL soft --->**	**168**	**120**
128	80	**65 CNEL**	**78**	**30**
40	-7	**70 CNEL**	**36**	**-11**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Big Bear Blvd.: East of Stanfield Cutoff - 2006 - Without Project

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**38**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the nearest lane centerline (>50') (used in calculations)	100	
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**62.54**	
VOL		TOTAL Vehicle Volume (two-way)	**19,005**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
426	378	**<-- hard 60 CNEL soft --->**	**173**	**126**
135	87	**65 CNEL**	**81**	**33**
43	-5	**70 CNEL**	**37**	**-10**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Big Bear Blvd.: East of Stanfield Cutoff - 2006 - With Project

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**38**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the	100	
		nearest lane centerline (>50')		
		(used in calculations)		
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**62.63**	
VOL		TOTAL Vehicle Volume (two-way)	**19,405**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
434	387	**<-- hard 60 CNEL soft --->**	**176**	**128**
137	90	**65 CNEL**	**82**	**34**
43	-4	**70 CNEL**	**38**	**-10**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Big Bear Blvd.: East of Stanfield Cutoff - 2025 - Without Project

Speed		Vehicle Speed (mph, 0 to 100)	**40**	
Grad		Road Gradient (%, 0 to 6)		
Sep1		Centerline Separation (feet)	**38**	
	with >>	(Usually 23' for 2-lane, 38'		
	median >>	for 4-lane, 50' for 6-lane)		
Dist1		Distance from observer to the	100	
		nearest lane centerline (>50')		
		(used in calculations)		
Dist2		Dist. from ROW to NLC	**30**	
		*** CNEL @ 100' **(SOFT)**	**63.26**	
VOL		TOTAL Vehicle Volume (two-way)	**22,444**	
ALPHA		Hard site=0, Soft site=0.5	0.5	

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
502	455	**<-- hard 60 CNEL soft --->**	**194**	**146**
159	111	**65 CNEL**	**90**	**42**
50	3	**70 CNEL**	**42**	**-6**

View		View Angle of Observer (180)	180
		SHIELDING (adjust output by hand)	
		~~	
Woods		Thickness of woodland between observer and road (feet)	0
Cover		Percent view coverage between observer and road (0-100)	0
Rows		Building rows between observer and roadway (0-4).	0

Big Bear Blvd.: East of Stanfield Cutoff - 2025 - With Project

//	Speed		Vehicle Speed (mph, 0 to 100)	40
//	Grad		Road Gradient (%, 0 to 6)	
//	Sep1		Centerline Separation (feet)	38
//		with >>	(Usually 23' for 2-lane, 38'	
//		median >>	for 4-lane, 50' for 6-lane)	
//	Dist1		Distance from observer to the	100
//			nearest lane centerline (>50')	
//			(used in calculations)	
//	Dist2		Dist. from ROW to NLC	30
//			*** CNEL @ 100' **(SOFT)**	**63.34**
//	VOL		TOTAL Vehicle Volume (two-way)	**22,844**
//	ALPHA		Hard site=0, Soft site=0.5	0.5

DISTANCE FROM Cntrline	DISTANCE FROM ROW	RESULTS	DISTANCE FROM **Centerline**	DISTANCE FROM **ROW**
510	463	**<-- hard 60 CNEL soft --->**	**196**	**149**
161	114	**65 CNEL**	**91**	**44**
51	4	**70 CNEL**	**42**	**-5**

//	View	View Angle of Observer (180)	180	
//		SHIELDING (adjust output by hand)		
//		~~~~~~~~~		
//	Woods	Thickness of woodland between	0	
//		observer and road (feet)		
//	Cover	Percent view coverage between	0	
//		observer and road (0-100)		
//	Rows	Building rows between observer	0	
//		and roadway (0-4).		

15.6 Biological Resources Information

MOON CAMP – TENTATIVE TRACT 16136
DRAFT BIOLOGICAL TECHNICAL REPORT

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July 9, 2003

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Appendices (Appendices are available for review at the County of San Bernardino Land Use Services Department)

A Botanical Survey Report
B Southern Rubber Boa Survey Report
C Southwestern Willow Flycatcher
D California Spotted Owl Survey Report
E Bald Eagle Survey Report
F Forester's Report

1.0 INTRODUCTION

This Biological Technical Report has been prepared to support California Environmental Quality Act (CEQA) documentation for the proposed Moon Camp - Tentative Tract 16136 project. This information has been reported in accordance with accepted scientific and technical standards that are consistent with the requirements of the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG).

1.1 PROJECT LOCATION AND DESCRIPTION

The Moon Camp - Tentative Tract 16136 property (hereafter referred to as the project site) is located on the northern shore of Big Bear Lake in unincorporated San Bernardino County, California (Exhibit 1). The project site is adjacent to the north shore of Big Bear Lake in the relatively undeveloped eastern portion of the community of Fawnskin. The project site encompasses approximately 62 acres to the north and south of State Highway 38 (also referred to as North Shore Drive) and is bound to the west by residences and Oriole Lane and to the north by residences and Flicker Road (Exhibit 2). The northeast corner is bound by Polique Canyon Road. The project site slopes gently downhill from north to south with elevations ranging from 6,960 feet above mean sea level (msl) in the northeastern portion of the site to 6,747 feet above msl at the lakefront. The project site can be found on the Fawnskin U.S. Geological Survey (USGS) 7.5-minute quadrangle map in the north half of Section 13, Township 2N, and Range 1W.

The proposed project consists of a Tentative Tract Map including a 95-lot residential subdivision with lots ranging in size from 0.17 acre (7,292 square feet) to 2.11 acres (92,000 square feet). Lots would be sold individually and development of lots and construction of homes would be made by custom design. Additionally, the project includes the relocation of Highway 38 to allow development of lakeshore lots. The 2,948-foot long section of Highway 38 which bisects the project site would be relocated approximately 207 feet to the north and widened to a 76-foot road width with 14-foot shoulders for bikeway access, resulting in a 104-foot right-of-way. Two loop roads are proposed to allow access to lots in the northern and southern halves of the project site. The northern loop road would access 64 lots. The southern loop road would access the remaining 32 lots and includes five separate cul-de-sac drives.

1.2 REGIONAL ENVIRONMENTAL SETTING

The project site is located approximately one mile northwest of the City of Big Bear Lake in the San Bernardino National Forest in unincorporated San Bernardino County, California. The project site is located approximately twelve miles northwest of the Heart Bar State Park, thirteen miles north of the San Gorgonio Wilderness Area, and 14 miles east of Lake Arrowhead. The project site is approximately nine miles northeast of the headwaters of the Santa Ana River and 18 miles northwest of the San Gorgonio River. The project site consists of vacant land with coniferous forest of varying density. Several trails resulting from unauthorized off-road vehicle use occur in the

western portion of the site, in the central portion of the site immediately north of Highway 38, and extending north from Moon Lane in the eastern portion of the site. Additionally, several hiking and walking trails have been established by local use. The project site is immediately adjacent to broad expanses of contiguous open space within the San Bernardino National Forest to the north and northeast.

2.0 SURVEY METHODOLOGIES

This section describes the methodologies used to conduct the various biological field surveys for the proposed project. The results of these survey efforts are discussed in the following section, Existing Biological Resources.

2.1 VEGETATION MAPPING AND GENERAL PLANT SURVEYS

A general reconnaissance field survey was conducted on December 11, 2001 by Scott White and Brian Leatherman to evaluate the potential of the project site to support special status plants and animals and determine the need for further focused biological surveys. Additional field surveys were conducted on May 11, 2002 by Mr. White and on June 26, 2002 by Mr. White and Sandy Leatherman to identify the vegetation types and plant species present on the project site. All plant species observed were recorded in field notes. Plant species were identified in the field or collected for later identification. Plants were identified using taxonomic keys in Hickman (1993), Munz (1974), and Abrams (1923, 1960). Taxonomy follows Hickman (1993) for scientific and common names. Plant community classifications used in this report follow Holland (1986).

2.2 GENERAL WILDLIFE SURVEYS

Wildlife species observed during the above mentioned general reconnaissance field survey were recorded in field notes. The project site was also evaluated for its potential to support special status wildlife species that are known or are expected to occur in the region. Additionally, all wildlife species observed during focused surveys were recorded in field notes. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and logs. Birds were identified by visual and auditory recognition. Mammals were identified by visual recognition and by identifying diagnostic sign, including scat, footprints, scratch-outs, burrows, and trails. Taxonomy and nomenclature for wildlife generally follow AOU (1998) for birds and Laudenslayer et al. (1991) for all other terrestrial vertebrates.

2.3 FOCUSED SURVEYS

2.3.1 Special Status Plant Species

Special status plant surveys were conducted by Mr. White and Ms. Leatherman in the spring and summer of 2002. All areas of the project site containing native habitats potentially suitable for

special status species were sampled using meandering transects. For a detailed discussion of survey methods refer to Appendix A - Botanical Survey Letter Report.

2.3.2 Rubber Boa

Focused surveys for the rubber boa (*Charina bottae*) were conducted by Mr. Leatherman, Bill LaHaye, Sam Stewart, and Brian Kertson in the spring and summer of 2002. The survey effort consisted of three-drift fence and pitfall trapping periods, and five visual encounter surveys. For a detailed discussion of survey methods refer to Appendix B - Rubber Boa Survey Letter Report.

2.3.3 Southwestern Willow Flycatcher

Focused surveys for the southwestern willow flycatcher (*Empidonax trailii*) were conducted by Jim Pike. Five surveys were conducted during the spring and summer of 2002 per the guidelines of the U.S. Fish and Wildlife Service (USFWS) (USFWS 2000). For a detailed discussion of survey methods refer to Appendix C - Southwestern Willow Flycatcher Survey Letter Report.

2.3.4 California Spotted Owl

Focused surveys for the California spotted owl (*Strix occidentalis occidentalis*) were conducted by Mr. LaHaye and Mr. Kertson from April through June 2002. Six nighttime surveys and one roost location survey were performed on the project site. Adjacent areas in the vicinity of the project site were also surveyed to determine if off-site individuals or pairs were foraging on the project site. For a detailed discussion of survey methods refer to Appendix D - California Spotted Owl Survey Letter Report.

2.3.5 Bald Eagle

Focused surveys for the bald eagle (*Haliaeetus leucocephalus*) were conducted by Mr. LaHaye and Mr. Kertson in February 2002. Four surveys were conducted to identify which trees on the project site were used most frequently by the bald eagle for perching and/or roosting. In addition, a records search was conducted to characterize historic bald eagle wintering activity and tree use on the project site and in the vicinity of Big Bear Lake. For a detailed discussion of survey methods refer to Appendix E - Bald Eagle Survey Letter Report.

2.3.6 Tree Survey

A Forester's Report was prepared in July 2001 by James Bridges (Registered Professional Forester – #1534) to provide information on timber stand composition, condition, site quality, soil classification and characteristics, and impact of construction and development on the project site. The report also provides guidelines for the protection of trees and prevention of insect infestation during the construction process. A complete copy of the report is included in Appendix F.

3.0 EXISTING BIOLOGICAL RESOURCES

This section describes the biological resources that either occur or potentially occur within the project site or in the immediate vicinity. Vegetation types, wildlife populations and movement patterns, special status vegetation types, and special status plant and wildlife species either known or potentially occurring are discussed below.

3.1 VEGETATION TYPES

Four vegetation types occur within the project site. Exhibit 3, Biological Resources, illustrates their distribution and Table 1, Existing Vegetation Types on the Project Site, summarizes the extent of vegetation types present within the project site. The following section describes each of the vegetation types observed during field surveys.

TABLE 1
EXISTING VEGETATION TYPES ON THE PROJECT SITE

Vegetation Type	Acreage
Jeffrey Pine Forest	54.91
Lake Shoreline	4.14
Pebble Plain	0.69
Developed	2.82
Total	**62.56**

3.1.1 Jeffrey Pine Forest

Jeffrey pine forest occurs on 38.08 acres of the eastern half of the project site. This area is dominated by Jeffrey pine (*Pinus jeffreyi*) with white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occurring at lower densities. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), Greg's ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches. Jeffrey pine forest occurs at elevations ranging from 3,200 to 7,800 feet above msl in southern California.

Portions of the Jeffrey pine forest on the project site provide suitable habitat for listed Threatened and Endangered plant species. In particular, approximately 17.38 acres containing few trees and fairly open canopy where Wright's matting buckwheat (*Eriogonum wrightii* ssp. *Subscaposum*) occurs are suitable habitat for the federally-listed Threatened ash-gray Indian paintbrush, CNPS 1B listed Parish's rock-cress (*Arabis parishii*), and CNPS 1B listed silver-haired ivesia. For this reason,

open Jeffrey pine forest is shown as a separate vegetation type on Exhibit 3. Additionally, areas within the Jeffrey pine forest where herbaceous cover is dominated by Wright's matting buckwheat are identified on Exhibit 3.

Within the Jeffrey pine forest onsite, tree resources consist of unevenly aged, pine stands composed of approximately 85 percent Jeffrey pine, eight percent western juniper, six percent singleleaf pinyon pine, and less than one percent of scattered white fir and black oak. Site quality has been rated medium Class 4 according to the criteria in the Forester's Handbook (USDA 1986). The medium Class 4 rating describes the site as having 40 to 59 percent tree cover (medium cover) with small trees of conifer crown diameter 12 to 24 feet, and trunk diameter at breast height (dbh) of 11 to 24 inches. A total of 2,772 trees six inches in diameter or larger was calculated from aerial photographs. These trees grow on soils classified as 2/3 Morical-Hecker in the southern portion and 1/3 Pacifico-Wapi in the northern portion. Morical-Hecker soils are very deep with an effective rooting depth of 40 inches, and have high moisture retention capability, moderate erosion hazard, and a good timber productivity rating. Pacifico-Wapi soils are shallow, with a 10 to 20 inch effective root depth, low moisture holding capacity, high erosion hazard, and a poor capacity for tree seedling survival and growth without supplemental irrigation.

The overall condition of trees on the property is classified as fair. Scattered groups of large Jeffrey pine and juniper are host to moderate amounts of dwarf mistletoe (*Phorodendron* sp.) and several saplings and small pole pines under these trees have become heavily infested. Although a large number of dead trees were observed on the site, only one tree was observed to have been recently killed by bark beetles. Given the current drought situation and beetle population, there is a high potential for additional tree mortality from insect attack.

3.1.2 Pebble Plain

Pebble plain occurs on 0.69 acre of the project site north of Highway 38. It appears as a distinct open patch within open Jeffrey pine forest in the western portion of the project site. The substrate in this area consists of clay soil mixed with quartzite pebbles and gravel that are continually pushed to the surface through frost action (Holland 1986, Neel and Barrows 1990). This substrate supports a high floristic diversity consisting of small cushion-forming plants, tiny annuals, grasses, and succulents that are well spaced, low growing, and sun tolerant. Several rare and special status plants are associated with pebble plain habitat, including federally-listed Threatened and Endangered species.

Portions of the pebble plain habitat on the project site have been subjected to disturbance by off-road vehicles. The Pebble Plain Habitat Management Guide and Action Plan was developed by the San Bernardino National Forest to provide management direction for long-term conservation of pebble plains and the rare plants associated with them. Closure of unauthorized vehicle routes through pebble plain habitat, signage, increased patrol, habitat acquisition, removal of non-native

grasses, and public education are actions being taken to protect and enhance the habitat (USDA 1990).

3.1.3 Lake Shoreline

Approximately 4.14 acres of the southern boundary of the project site is formed by the shore of Big Bear Lake. Plant species along the shore itself consisted primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Several seedling cottonwood trees (*Populus balsamifera* spp. *Trichocarpa*) also occur in this vegetation type. Small patches of meadow transitioning into upland grassland occur along the lakeshore south of Highway 38. The extent of the meadows could not be determined or mapped in 2002 due to dry conditions. The lake was well below its maximum level in 2001 to 2002 due to acute drought conditions. Vegetation is patchy above the high-water level where small areas of Jeffrey pine forest are interspersed among open meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laviegata*).

3.1.4 Developed

Developed areas occur on 2.82 acres along the shoreline of the site. This vegetation type consists of residential structures, paved areas, and associated landscaping including and adjacent to Highway 38. Plants found in this vegetation type consist of native and non-native ornamental species which offer very little habitat value for native wildlife species. Paved areas such as Highway 38 and residential driveways are included in this vegetation type.

3.2 WILDLIFE INVENTORY

3.2.1 Wildlife

Amphibians

Amphibians require moisture for at least a portion of their life cycle and many require standing or flowing water for reproduction. Although more typical in mesic conditions, there are a number of amphibians species that occur or potentially occur even in the more xeric habitats. Terrestrial species may or may not require standing water for reproduction. These species are able to survive in dry areas by remaining beneath the soil in burrows, under logs or leaf litter, and emerging only when temperatures are low and humidity is high. Many of these species' habitats are associated with water, and they emerge to breed once the rainy season begins. Soil moisture conditions can remain high throughout the year within some habitat types, depending on factors such as amount of vegetation cover, elevation, and slope aspect.

No amphibians were detected during the field surveys; however, leaf litter and rotting logs on the project site provide potential habitat for the Pacific slender salamander (*Batrachoseps pacificus*). The western toad (*Bufo boreas*) would also be expected to occur on the project site.

Reptiles

Reptilian diversity and abundance typically vary with vegetation type and character. Many species prefer only one or two vegetation types; however, most will forage in a variety of habitats. Most species occurring in open areas use rodent burrows for cover, and protection from predators and extreme weather conditions. Those species discussed below, which were not observed during surveys, are expected to occur based on the presence of suitable habitat (substrate and vegetation) within the project site.

Reptile species observed during the surveys include the western fence lizard (*Scleroporus occidentalis*), sagebrush lizard (*Sceloperus graciosus*), western skink (*Eumeces skiltonianus*), southern alligator lizard (*Elgaria multicarinatus*), and southern Pacific rattlesnake (*Crotalus viridis helleri*). Common reptile species expected to occur on the project site include the side-blotched lizard (*Uta stansburiana*) and gopher snake (*Pituophis melanoleucus*).

Birds

Montane conifer forests in the San Bernardino Mountains can experience severe winter conditions during the winter months. Nonetheless, several resident bird species are expected to occur on the project site, using the habitats throughout the year. Other species are present only during certain seasons. For example, the Anna's hummingbird (*Calypte anna*), which was observed on the project site, is expected to occur during the breeding season (i.e., spring and summer) and will then migrate south for the winter.

Common resident bird species observed on the project site during surveys include wild turkey (*Meleagris gallopavo*), band-tailed pigeon (*Columba fasciata*), great-horned owl (*Bubo virginianus*), acorn woodpecker (*Melanerpes formicivorus*), red-breasted sapsucker (*Sphyrapicus ruber*), hairy woodpecker (*Picoides villosus*), Nuttall's woodpecker (*Picoides nuttallii*), northern flicker (*Colaptes auratus*), black phoebe (*Sayornis nigricans*), Stellar's jay (*Cyanocitta stelleri*), common raven (*Corvus corax*), mountain chickadee (*Poecile gambeli*), bushtit (*Psaltriparus minimus*), red-breasted nuthatch (*Sitta canadensis*), white-breasted nuthatch (*Sitta carolinensis*), house wren (*Troglodytes aedon*), western bluebird (*Sialia mexicana*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), spotted towhee (*Pipilo maculatus*), dark-eyed junco (*Junco hyemalis*), Brewer's blackbird (*Euphagus cyanocephalus*), brown-headed cowbird (*Molothrus ater*), house finch (*Carpodacus mexicanus*), and red crossbill (*Loxia curvirostra*).

Other resident species expected to occur on the project site include pied-billed grebe (*Podilymbus podiceps*), great blue heron (*Ardea herodias*), mallard (*Anas platarynchos*), gadwall (*anas strepera*),

ruddy duck (*Oxyura jamaicensis*), red shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), American coot (*Fulica americana*), killdeer (*Charadrius vociferus*), rock dove (*Columbia livia*), mourning dove (*Zenaida macroura*), pygmy nuthatch (*Sitta pygmaea*), brown creeper (*Certhia americana*), Bewick's wren (*Thryomanes bewickii*), American robin (*Turdus migratorius*), and pine siskin (*Carduelis pinus*).

Montane conifer habitats in the San Bernardino Mountains typically experience mild, warm summer months. Given the mild climate and abundance of nesting habitat, several bird species are expected to occur on the project site during the breeding season. Common breeding bird species observed on the project site during surveys include Anna's hummingbird and western wood-peewee (*Contopus sordidulus*). Other common breeding species expected to occur on the project site include the spotted sandpiper (*Actitis macularia*), violet green swallow (*Tachycineta thalassina*), and yellow-rumped warbler (*Dendroica coronata*).

Mammals

The ornate shrew (*Sorex ornatus*), brush mouse (*Peromyscus boylii*), western grey squirrel (*Sciurus griseus*), California ground squirrel (*Spermophilus beecheyi*), dusky-footed woodrat (*Neotoma fuscipes*), California vole (*Microtus californicus*), and coyote (*Canis latrans*) were observed on the project site during the surveys. Several additional species are expected to occur. These include small mammals such as the dusky shrew (*Sorex monticolus*), broad-footed mole (*Scapanus latimanus*), Merriam's chipmunk (*Tamias merriami*), lodgepole chipmunk (*Tamias speciosus*), golden-mantled ground squirrel (*Spermophilus lateralis*), deer mouse (*Peromyscus maniculatus*), western harvest mouse (*Reithrodontomys megalotis*), Botta's pocket gopher (*Thomomys bottae*), and house mouse (*Mus musculus*). Easily detectable mammals that are expected to occur on the site include the Virginia opossum (*Didelphis virginiana*), porcupine (*Erethizon dorsatum*), long-tailed weasel (*Mustela frenata*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), mule deer (*Odocoileus hemionus*), and bobcat (*Felis rufus*). Larger mammals that may occur on the project site include the gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), badger (*Taxidea taxus*), and mountain lion (*Felis concolor*).

Bats occur throughout most of southern California and may use any portion of the project site as foraging habitat. Most of the bats that could potentially occur onsite are inactive during the winter and either hibernate or migrate, depending on the species. The California myotis (*Myotis californicus*) and big brown bat (*Eptesicus fuscus*) may occur on the project site. Gaps in peeling bark and hollow snags or limbs provide potential roosting and maternal colony opportunities for these and other bat species.

3.2.2 Wildlife Movement

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (e.g. juvenile animals from natal areas, individuals extending range distributions); (2) seasonal

migration; and (3) movements related to home range activities (e.g., foraging for food or water, defending territories, searching for mates, accessing breeding areas, or securing cover). A number of terms have been used in various wildlife movement studies, such as "travel route," "wildlife corridor," and "wildlife crossing" to refer to areas in which wildlife move from one area to another.

To clarify the meaning of these terms and to facilitate the discussion on wildlife movement in this analysis, these terms are briefly defined as follows:

- *Travel Route* – a landscape feature such as a ridgeline, drainage, canyon, or riparian strip within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g., water, food, cover, den sites).

- *Wildlife Corridor* – a piece of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another.

- *Wildlife Crossing* – a small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement.

As defined above, the project site does not contain wildlife crossings or corridors. The project site could be used as a travel route connecting forest habitat to the north with Big Bear Lake. However, direct connection to open space areas north and east of the project site are obstructed by Highway 38. The importance of this travel route may be diminished by the vehicle traffic hazard associated with crossing Highway 38 as well as the availability of similar habitat adjacent to the east of the project site.

3.3 SPECIAL STATUS BIOLOGICAL RESOURCES

The following section addresses special status biological resources observed, reported, or having the potential to occur on the project site. These resources include plant and wildlife species that have been afforded special status and/or recognition by federal and state resource agencies, as well as the California Native Plant Society (CNPS). In general, the principal reason an individual taxon (i.e., species, subspecies, or variety) is given such recognition is the documented or perceived decline or limitations of its population size, geographic range, and/or distribution resulting in most cases from habitat loss. A summary of special status plant and wildlife species known to occur in the project region including information on the status, potential for occurrence, and definitions for the various status designations are presented in Tables 1 and 2, respectively. In addition, special status biological resources include vegetation types and habitats that are either unique, of relatively limited distribution in the region, or of particularly high wildlife value. These resources have been defined

by federal, state, and local government conservation programs. Sources used to determine the special status of biological resources are as follows:

- Plants - *Electronic Inventory of Rare and Endangered Vascular Plants of California.* (California Native Plant Society [CNPS] [2000]). California Natural Diversity DataBase (CNDDB) *List of Special Plants* (CDFG [2002]). Various Federal Register notices from the USFWS regarding listing status of plant species.

- Wildlife – California Wildlife Habitat Relationships Database System (CDFG 1991); CNDDB (CDFG 2000), Various Federal Register notices from the USFWS regarding listing status of wildlife species.

- Habitats – CNDDB (CDFG 2000).

TABLE 2
SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT REGION

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Abronia nana ssp. *covillei* Coville's dwarf abronia	—	—	4	Low; marginally suitable habitat
Allium parishii Parish's onion	—	—	4	Low; above known elevation range
Antennaria marginata White-margined everlasting	—	—	2	None; outside of known geographic range (only local occurrences in Barton Flats area)
Arabis breweri var. *pecuniaria* San Bernardino rock-cress	—	—	1B	None; far below known elevation range
Arabis dispar Pinyon rock-cress	—	—	2	None; outside known geographic range (only occurs on desert-facing slopes)
Arabis parishii Parish's rock-cress	—	—	1B	Observed
Arabis shockleyi Shockley's rock-cress	—	—	2	None; outside known geographic range (only local occurrences on desert-facing slopes)
Arenaria lanuginosa ssp. *Saxosa* Rock sandwort	—	—	2	Moderate; marginally suitable habitat
Arenaria ursina Big Bear Valley sandwort	FT	—	1B	High; suitable habitat
Astragalus albens Cushenbury milk-vetch	FE	—	1B	None; no suitable habitat (carbonate soils)
Astragalus bicristatus Crested milk-vetch	—	—	4	High; suitable habitat
Astragalus lentiginosus var. *Sierrae* Big Bear Valley milk-vetch	—	—	1B	High; suitable habitat
Astragalus leucolobus Big Bear Valley woollypod	—	—	1B	Observed
Atriplex parishii Parish's smallscale	—	—	1B	None; no suitable habitat (alkali sink)

TABLE 2 (continued)
SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT REGION

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Berberis fremontii Fremont's barberry	—	—	3	None; no suitable habitat (presumed extinct in Cushionbury area)
Botrychium crenulatum Scalloped moonwort	—	—	2	None; no suitable habitat (marshes, bogs)
Calochortus palmeri var. *palmeri* Palmer's mariposa lily	—	—	1B	Moderate; marginally suitable habitat
Calochortus plummerae Plummer's mariposa lily	—	—	1B	None; above known elevation range
Castilleja cinerea Ash-gray Indian paintbrush	FT	—	1B	Observed
Castilleja lasiorhyncha San Bernardino Mountain owl's clover	—	—	1B	High; suitable habitat
Dryopteris filix-mas Male fern	—	—	2	Low; local rarity; outside known range
Dudleya abramsii ssp. *affinis* San Bernardino Mountains dudleya	—	—	1B	Moderate; marginally suitable habitat
Erigeron breweri var. *jacinteus* San Jacinto Mountains daisy	—	—	4	None; below known elevation range
Erigeron parishii Parish's daisy	FT	—	1B	None; no suitable habitat (carbonate soils)
Erigeron unicaulis Limestone daisy	—	—	2	None; outside known geographic range (local reports erroneous)
Eriogonum foliosum Leafy buckwheat	—	—	1B	High; suitable habitat
Eriogonum kennedyi var. *austromontanum* Southern mountain buckwheat	FT	—	1B	Low; suitable habitat (see text)
Eriogonum ovalifolium var. *vineum* Cushenbury buckwheat	FE	—	1B	None; no suitable habitat (carbonate soils)
Eriophyllum lanatum var. obovatum Southern Sierra wooly sunflower	—	—	4	Low; margin of known geographic range
Fimbristylis thermalis Hot springs fimbristylis	—	—	4	None; no suitable habitat (alkaline meadows, hot springs)
Galium jepsonii Jepson's bedstraw	—	—	4	High; suitable habitat
Galium johnsttonii Johnston's bedstraw	—	—	4	High; suitable habitat
Gentiana fremontii Moss gentian	—	—	2	None; below known elevation range
Gilia leptantha ssp. *leptantha* San Bernardino Mountains gilia	—	—	1B	Low (see text)
Helianthus nuttalli ssp. *parishii* Los Angeles sunflower	—	—	1A	None; presumed extinct, above known elevation range
Heuchura hirsutissima Shaggy-haired alum root	—	—	1B	Low; limited suitable habitat
Heuchura parishii Parish's alumroot	—	—	1B	Low; limited suitable habitat
Horkelia wilderae Barton Flats horkelia	—	—	1B	None; outside known geographic range, endemic to Barton Flats area

TABLE 2 (continued)
SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT REGION

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Hulsea vestita ssp. *parryi* Parry's sunflower	—	—	4	None; outside known geographic range (only occurs on desert-facing slopes)
Hulsea vestita ssp. *pygmaea* Pygmy hulsea	—	—	1B	None; below elevation range
Ivesia argyrocoma Silver-haired ivesia	—	—	1B	Observed
Juncus duranii Duran's rush	—	—	4	High; suitable habitat
Lesquerella kingii var. *bernardina* San Bernardino Mountains bladderpod	FE	—	1B	None; no suitable habitat (carbonate soils)
Lewisia brachycalyx Short-sepaled lewisia	—	—	2	Moderate; limited suitable habitat
Lilium humbodtii ssp. *ocellatum* *Ocellated Humboldt lily*	—	—	4	None; above known elevation range
Lillium parryi Lemon lily	—	—	1B	Low; limited suitable habitat
Linanthus killipii Baldwin Lake linanthus	—	—	1B	High; suitable habitat
Malaxiis monohyllos ssp. *brachypoda* Adder's mouth	—	—	2	None; below known elevation range
Mimulus exiguus San Bernardino Mountain monkeyflower	—	—	1B	High; suitable habitat
Mimulus purpureus var. *purpureus* Purple monkeyflower	—	—	2	High; suitable habitat
Monardella macrantha ssp. *hallii* Hall's monardella	—	—	1B	None; outside known geographic range
Navarretia peninsularis Baja navarretia	—	—	1B	Low; limited suitable habitat
Oxytheca caryophylloides Chickweed oxytheca	—	—	4	High; suitable habitat
Oxytheca parishii var. *cienegensis* Cienega seca oxytheca	—	—	1B	None; outside known geographic range
Oxytheca parishii var. *goodmaniana* Cushenbury oxytheca	FE	—	1B	None; no suitable habitat (carbonate soils)
Oxytropis oreophila Mountain oxytrope	—	—	2	None; below known elevation range
Perideridia parishii ssp. *parishii* Parish's yampah	—	—	2	High; suitable habitat
Phacelia exilis Transverse Range phacelia	—	—	4	High; suitable habitat
Phacelia mohavensis Mojave phacelia	—	—	4	High; suitable habitat
Phlox dolichantha Bear Valley phlox	—	—	1B	High; suitable habitat
Poa atropurpurea San Bernardino bluegrass	FE	—	1B	High; suitable habitat
Poliomintha incana Frosted mint	—	—	1A	None; no suitable habitat (dunes and sandy flats), above known elevation range

TABLE 2 (continued)
SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT REGION

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Polystichum kruckebergii Krukeberg's sword fern	—	—	4	None; limited suitable habitat, outside known geographic distribution
Populus angustifolia Narrow-leaved cottonwood	—	—	2	None; outside known geographic range
Pyrrocoma uniflora ssp. *gossypina* Bear Valley pyrrocoma	—	—	1B	High; suitable habitat
Rupertia rigida Parish's rupertia	—	—	4	High; suitable habitat
Scutellaria bolanderi ssp. *austromntanum* Southern mountain skullcap	—	—	1B	None, outside known geographic range, above known elevation range
Sedum niveum Davidson's stonecrop	—	—	4	None; no suitable habitat (rock ledges and cliffs)
Selaginella asprella Bluish spike-moss	—	—	4	Low; limited suitable habitat
Senecio bernardinus San Bernardino butterweed	—	—	1B	Low; limited suitable habitat
Senecio ionophyllus Tehachapi ragwort	—	—	4	Low; limited suitable habitat
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	C	R	1B	Low; limited suitable habitat
Sidalcea pedata Bird's foot checkerbloom	FE	SE	1B	Low to moderate (see text); suitable habitat
Sphenopholis obtusata Prairie wedge grass	—	—	2	High; suitable habitat
Streptanthus bernardinus Laguna Mountains jewelflower	—	—	4	High; suitable habitat
Streptanthus campestris Southern jewelflower	—	—	1B	High; suitable habitat
Swertia neglecta Pine green-gentian	—	—	4	High; suitable habitat
Taraxacum californicum California dandelion	FE	—	1B	Low to moderate (see text); suitable habitat
Thelypodium stenopetalum Slender-petaled thelypodium	FE	—	1B	None; no suitable habitat (alkaline meadows)
Trichostema micranthum Small-flowered bluecurls	—	—	4	High; suitable habitat
Viola pinetorum ssp. *grisea* Grey-leaved violet	—	—	1B	Low; outside known geographic range

TABLE 2 (continued)
SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT REGION

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
STATUS DEFINITIONS				
USFWS				
FE: Species designated as endangered under the federal Endangered Species Act. Endangered = "any species in danger of extinction throughout all or a significant portion of its range."				
FT: Species designated as threatened under the Federal Endangered Species Act. Threatened = "species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."				
FPE: Proposed for federal listing as Endangered.				
FPT: Proposed for federal listing as Threatened.				
C: Candidate for federal listing as Threatened or Endangered.				
SOC: Species of Concern				
CDFG				
ST: Threatened = "a species that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this Act" (California Endangered Species Act).				
SE: Endangered = "a species is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes."				
R: Rare				
CNPS				
1A Plants Presumed Extinct in California				
1B Plants Rare, Threatened, or Endangered in California and Elsewhere				
2 Plants Rare, Threatened, or Endangered in California But More Common Elsewhere				
3 Plants About Which We Need More Information- A Review List				
4 Plants of Limited Distribution - A Watch List				

TABLE 3
SPECIAL STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT REGION

Species	Status[1]		Likelihood for Occurrence
	USFWS	CDFG	
Invertebrates			
Euchloe hyantis ssp. *andrewsi* Andrews' marble butterfly	SOC	—	Low; above known elevation range, limited suitable habitat
Amphibians			
Ensatina escholtzii croceater Yellow-blotched salamander	SOC	SSC	Low; limited marginally suitable habitat
Ensatina escholtzii klauberi Large-blotched salamander	SOC	SSC	None; above known elevation range, outside known geographic range
Rana muscosa Mountain yellow-legged frog	FPE	SSC	None; no suitable habitat
Scaphiopus hamondii Western spadefoot toad	SOC	SSC	None; above known elevation range
Taricha torosa torosa Coast range newt	SOC	SSC	None; no suitable habitat, above known elevation range
Reptiles			
Anniella pulchra pulchra Silvery legless lizard	SOC	SSC	Low; above known elevation range
Charina bottae umbricata Southern rubber boa	SOC	ST	Low; limited suitable habitat
Cnemidophorus tigris multiscutatus Coastal western whiptail	SOC	—	Moderate; suitable habitat
Coleonyx variegatus abbotti San Diego banded gecko	SOC	—	None; above known elevation range, no suitable habitat
Diadophis punctatus modestus San Bernardino ringneck snake	SOC	—	Low; limited suitable habitat
Lampropeltis zonata parvirubra San Bernardino Mountain kingsnake	SOC	—	Moderate; marginally suitable habitat
Lichanura trivirgata roseofusca Coastal rosy boa	SOC	—	None; above known elevation range
Phrynosoma coronatum ssp. *blainvillei* San Diego coast horned lizard	SOC	SSC/P	None; above known elevation, lack of suitable habitat
Sceloporus graciosus vendenbergianus Southern sagebrush lizard	SOC	—	Observed
Salvadora hexalepis virgultea Coast patch-nosed snake	SOC	SSC	None; lack of suitable habitat, above known elevation
Thamnophis hammondii hammondii Two-striped garter snake	—	SSC	None; no suitable habitat

TABLE 3 (continued)
SPECIAL STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT REGION

Species	Status[1]		Likelihood for Occurrence
	USFWS	CDFG	
Birds			
Accipiter cooperii Cooper's hawk	–	SSC	Nesting: Moderate Foraging: High
Accipiter gentilis Northern goshawk	SOC	SSC	Nesting: None Foraging: Moderate
Accipiter striatus Sharp-shinned hawk	–	SSC	Nesting: None Foraging: High in winter
Aimophila ruficeps canescens Southern California rufous-crowned sparrow	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Amphispiza belli belli Bell's sage sparrow	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Aquila chrysaetos Golden eagle	–	SSC	Nesting: None Foraging: High
Asio otus Long-eared owl	–	SSC	Nesting: Low Foraging: Moderate
Buteo regalis Ferruginous hawk	SOC	SSC	Nesting: None Foraging: Low in winter
Circus cyaneus Northern harrier	–	SSC	Nesting: None Foraging: Low
Cypseloides niger Black swift	–	SSC	Nesting: None Foraging: Moderate
Dendroica petechia Yellow warbler	–	SSC	Nesting: None Foraging: Moderate
Elanus leucereus White-tailed kite	–	FP	Nesting: Low Foraging: Low
Empidonax traillii extimus Southwestern willow flycatcher	FE	SE	Nesting: Low Foraging: Moderate; rare migrant
Eremophila alpestris actia California horned lark	–	SSC	Nesting: None Foraging: None; above known elevation range
Falco columbaris Merlin	–	SSC	Nesting: None Foraging: Low
Falco mexicanus Prairie falcon	–	SSC	Nesting: None Foraging: Low
Falco peregrinus anatum American Peregrine falcon	–	FE	Nesting: None Foraging : Low
Haliaeetus leucocephalus Bald eagle	FE	SE	Nesting: None Foraging: Observed in winter

TABLE 3 (continued)
SPECIAL STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT REGION

Species	Status[1]		Likelihood for Occurrence
	USFWS	CDFG	
Lanius ludovicianus Loggerhead shrike	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Piranga flava Hepatic tanager	–	SSC	Nesting: Low Foraging: Low
Progne subis Purple martin	–	SSC	Nesting: Low Foraging: Low; local rarity
Strix occidentalis occidentalis California spotted owl	SOC	SSC	Nesting: Low/None observed during focused surveys Foraging: High/Observed in close proximity to project site
Vireo vicinior Gray vireo	–	SSC	Nesting: None Foraging: Low
Mammals			
Antrozus pallidus Pallid bat	–	SSC	Roosting: Low Foraging: Low
Euderma maculatum Spotted bat	SOC	SSC	Roosting: None Foraging: Moderate
Eumops perotis californicus California mastiff bat	SOC	SSC	Roosting: None Foraging: Low
Glaucomys sabrinus californicus San Bernardino Mountian flying squirrel	SOC	SSC	Breeding: Low Foraging: High
Myotis ciliolabrum Small-footed myotis	SOC	–	Roosting: Low Foraging: High
Myotis evotis Long-eared myotis	SOC	–	Roosting: High Foraging: High
Myotis lucifugus Occult little brown bat	SOC	SSC	Roosting: High Foraging: High
Myotis thysanodes Fringed myotis	SOC	–	Roosting: Low Foraging: Moderate
Myotis volans Long-legged myotis	SOC	–	Roosting: Moderate Foraging: Moderate
Myotis yumanensis Yuma myotis	SOC	–	Roosting: Low Foraging: Moderate
Onychomys torridus ramona Southern grasshopper mouse	SOC	SSC	None; no suitable habitat
Perognathus alticola alticola White-eared pocket mouse	SOC	SSC	None; presumed extinct locally
Plecotus townsendii townsendii Pacific western big-eared bat	SOC	SSC	Roosting: None Foraging: Moderate

TABLE 3 (continued)
SPECIAL STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT REGION

Species	Status[1]		Likelihood for Occurrence
	USFWS	CDFG	
Status Definitions1 USFWS FE: Species designated as Endangered under the Federal Endangered Species Act. Endangered = "any species in danger of extinction throughout all or a significant portion of its range." FT: Species designated as Threatened under the Federal Endangered Species Act. Threatened = "species likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range." FPE: Proposed for federal listing as Endangered. FPT: Proposed for federal listing as Threatened. SOC: Species of Concern CDFG SR: Rare = "a species is rare when, although not presently Threatened with extinction, it is in such small numbers throughout its range that it may become Endangered if its present environment worsens." ST: Threatened = "a species that, although not presently Threatened with extinction, is likely to become an Endangered species in the foreseeable future in the absence of the special protection and management efforts required by this Act (California Endangered Species Act)." SE: Endangered = "a species is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes." SSC: Species of Special Concern. FP: Fully Protected species are protected by special legislation and cannot be taken at any time. P: Protected species are also protected by special legislation and can only be taken with a permit issued by the CDFG.			

3.3.1 Definitions of Special Status Biological Resources

Special status habitats are vegetation types, associations, or subassociations that support concentrations of special status plant or wildlife species, are of relatively limited distribution, or are of particular value to wildlife. Although special status habitats are not afforded legal protection unless they support protected species, potential impacts on them may increase concerns and mitigation suggestions by resources agencies.

A **federally-listed Endangered species** is a species facing extinction throughout all or a significant portion of its geographic range. A **federally-listed Threatened species** is a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. The presence of any federally Threatened or Endangered species on an area proposed development leads to a CEQA documentation of "significance" and (for wildlife or, where there is a federal nexus, for plants) requires consultation with USFWS, particularly if development would result in "take" of the species or its habitat. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct. Harm in this sense can include any disturbance to habitats used by the species during any portion of its life history.

Proposed species are those officially proposed by the USFWS for addition to the federal Threatened and Endangered species list. Because proposed species may become listed as

Threatened or Endangered prior to or during implementation of a proposed development project, they are treated here as though they are listed species.

The State of California considers an **Endangered species,** a species whose prospects of survival and reproduction are in immediate jeopardy. **Threatened species** is a species in such small numbers throughout its range that it is likely to become an Endangered species in the near future in the absence of special protection or management. A **Rare species** is one present in such small numbers throughout its range that it may become Endangered if its present environment worsens. Rare species applies to California native plants listed prior to the State Endangered Species Act. State Threatened and Endangered species are fully protected against take unless an incidental take permit is obtained from the wildlife agencies.

Federal Species of Concern are species (a "term of art" for former Category 2 candidates) with an informal designation by the USFWS for some declining species that are not federal candidates for listing at this time, but are noted in the CNDDB (CDFG 2002a). This list of species is not actively maintained by the USFWS.

California Species of Special Concern is an informal designation used by the CDFG for some declining wildlife species that are not state candidates. This designation does not provide legal protection, but signifies that these species are recognized as special status by the CDFG.

Species that are **California Fully Protected** and **Protected** include those protected by special legislation for various reasons, such as the mountain lion and white-tailed kite. Fully Protected Species may not be taken or possessed at any time. California Protected Species include those species that may not be taken or possessed at any time except under special permit from the department issued pursuant to Sections 650 and 670.7 of the California Code of Regulations, or Section 2081 of the Fish and Game Code.

Special Plant and **Special Animal** are general terms that refer to all of the species the CNDDB is interested in tracking, regardless of their legal or protection status. This term includes species designated as any of the above terms but also includes species that may be considered biologically rare, restricted in distribution, declining throughout their range, are on the periphery of their range and are threatened with extirpation in California, are associated with special status habitats, or are considered by other state or federal agencies or private organizations to be sensitive or declining. Species of **Local Concern** are those that have no official status with the resource agencies, but are being watched because either there is a unique population in the region or the species is declining in the region.

The California Native Plant Society is a private organization that has developed an inventory of California's special status plant species (CNPS 2001). This inventory summarizes the distribution, rarity, and endangerment of California's vascular plants. This rare plant inventory is comprised of four lists. CNPS presumes that **List 1A** plant species are extinct in California because they have not

been seen in the wild for many years. CNPS considers **List 1B** plants as rare, threatened, or endangered throughout their range. **List 2** plant species are considered rare, threatened, or endangered in California but more common elsewhere. Plant species for which CNPS needs additional information are included on **List 3**. **List 4** plant species are those of limited distribution in California whose susceptibility to threat appears low at this time.

3.3.2 Special Status Vegetation Types

Pebble Plain

The pebble plain community found on the project site is recognized as a special status vegetation type by local, state, and federal resources agencies. Pebble plain (also called pavement plain) is endemic to a 92-square-mile area in the San Bernardino Mountains at elevations between 6,000 and 7,500 feet above msl (Stephenson and Calcarone 1999). Vegetation structure of pebble plain habitat is similar to the mat-forming structure of alpine sites at much higher elevations (Derby and Wilson 1978). Vegetation consists largely of well-spaced cushion-forming perennials and a variety of tiny annuals. Bunchgrasses and some succulents may also occur. Several special status plants, including Threatened or Endangered species, are known to occur on pebble plain and are discussed in the special status plant section.

Pebble plain on the project site occurs as a distinct open patch within the surrounding open Jeffrey pine forest. Much of the pebble plain habitat on the project site has been subjected to disturbance by unauthorized off-road vehicle use. The disturbance has reduced vegetation cover, disturbed the natural hydrologic pattern, and perhaps reduced habitat quality for special status plants. However, based on National Forest management efforts at other sites, vehicle disturbance apparently does not permanently alter habitat suitability of this vegetation type.

Montane Meadow

Small patches of meadow transitioning into upland grassland occur along the lakeshore south of Highway 38. The extent of the meadows could not be determined or mapped in 2002 due to dry conditions. Meadows in the Big Bear Valley may be perennially saturated (i.e., wet meadows) or may have seasonally saturated soils during wet years (i.e., vernal meadows). This vegetation type is generally dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.), and grasses (*Poa* spp., *Elymus* spp.). Dry meadows and the margins of wet meadows may also support big sagebrush (*Artemisia tridentata*) and timberline sagebrush (*Artemisia rothrockii*).

Meadow habitat in the San Bernardino Mountains is not officially recognized as a special status vegetation type by the CDFG but it is known to support several locally endemic plants [e.g., bird's foot checkerbloom (*Sidalcea pedata*), San Bernardino bluegrass (*Poa atropurpurea*), and California dandelion (*Taraxacum californicum*)] and is therefore considered to be of local concern.

Additionally, the San Bernardino National Forest recognizes montane meadow habitat as a rare ecological community of concern.

3.3.3 Special Status Plants

Eighty-one special status plant species are known to occur in the project region, 50 of which occur or have the potential to occur on the project site. A brief description of the special status plant species that were determined to have potential to occur on the project site are listed below alphabetically according to their scientific name. This information is also summarized in Table 2.

Coville's Dwarf Abronia (*Abronia nana* ssp. *covillei*)

Coville's dwarf abronia is a CNPS List 4 species that typically blooms from May to August. This perennial herb occurs in carbonate, sandy soils in Joshua tree woodland, pinyon-juniper woodland, subalpine coniferous forest, and upper montane coniferous forest between 5,200 and 9,200 feet above msl. This species occurs in the Inyo, Mono, and San Bernardino counties. The project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be low.

Parish's Onion (*Allium parishii*)

Parish's onion is a CNPS List 4 species that typically blooms from April to May. This perennial, bulbiferous herb occurs in rocky soils of Joshua tree woodland, Mojavean desert scrub, and pinyon-juniper woodland between 3,000 and 6,000 feet above msl. This species occurs in the Imperial, Riverside, and San Bernardino counties. The project site provides suitable habitat for this species but is above the known elevation range for this species and the potential for occurrence is considered to be low.

Parish's Rock-Cress (*Arabis parishii*)

Parish's rock cress is a CNPS List 1B species that typically blooms from April to May. This perennial herb occurs in rocky, quartzite and clay, or sometimes carbonate soils in pebble plains, pinyon-juniper woodlands, and upper montane coniferous forests from approximately 3,900 to 8,000 feet above msl. It is endemic to the San Bernardino Mountains. This species was observed uncommonly in scattered patches throughout pebble plain and open Jeffrey pine forest on the project site during botanical surveys conducted in 2002.

Rock Sandwort (*Arenaria lanuginosa* ssp. *Saxosa*)

Rock sandwort is a CNPS List 2 species that typically blooms from July to August. This perennial herb occurs in mesic, sandy soils of subalpine, coniferous forests, and upper montane coniferous forests from approximately 5,900 to 9,000 feet above msl. It is found only in the San Bernardino

Mountains in the state of California but also occcurs in Arizona, Baja California, and elsewhere. The project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be moderate.

Big Bear Valley Sandwort (*Arenaria ursina*)

Big Bear Valley sandwort is a federally-listed Threatened and CNPS List 1B species that typically blooms from May to August. This perennial herb occurs in mesic, rocky soils of pebble plain, and pinyon-juniper woodland from approximately 6,400 to 6,900 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Crested Milk-Vetch (*Astragalus bicristatus*)

Crested milk-vetch is a CNPS List 4 species that typically blooms from May to August. This perennial herb occurs in sandy or rocky soils of lower and upper montane coniferous forests from approximately 5,500 to 8,200 feet above msl. This species is found in the San Bernardino, San Gabriel, and San Jacinto mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Big Bear Valley Milk-Vetch (*Astragalus lentiginosus* var. *Sierrae*)

Big Bear Valley milk-vetch is a CNPS List 1B species that typically blooms from April to August. This perennial herb occurs in gravelly or rocky soils of desert scrub, meadows and seeps, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,800 to 8,500 feet above msl. It is found in the San Bernardino, San Gabriel, San Jacinto, and Santa Rosa mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Big Bear Valley Woollypod (*Astragalus leucolobus*)

Big Bear Valley woollypod is a CNPS List 1B species that typically blooms from May to July. This perennial herb occurs in rocky soils of lower montane coniferous forest, pebble plain, pinyon-juniper woodland, and upper montane coniferous forests from approximately 5,600 to 8,000 feet above msl. It is found in the San Bernardino, San Gabriel, San Jacinto, and Santa Rosa mountains. This species was observed throughout the project site during botanical surveys conducted in 2002.

Palmer's Mariposa Lily (*Calochortus palmeri* var. *palmeri*)

Palmer's mariposa lily is a CNPS List 1B species that typically blooms between May and July. This perennial, bulbiferous herb occurs in mesic chaparral, lower montane coniferous forest, meadows, and seeps from approximately 3,200 to 7,200 feet above msl. It is a California endemic found in the

South Coast and Transverse ranges in Kern, Los Angeles, Riverside, Santa Barbara, San Bernardino, San Luis Obispo, and Ventura counties. This species was not observed during the 2002 botanical surveys. However, it has a moderate potential to occur on the project site given the availability of marginally suitable habitat in mesic portions of Jeffrey pine forest.

Ash-Gray Indian Paintbrush (*Castilleja cinerea*)

Ash-gray Indian paintbrush is a federally-listed Threatened and CNPS List 1B species. It is a root parasite on other plants, often parasitizing the federally-listed Threatened southern mountain buckwheat and Wright's matting buckwheat. It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows, seeps, and open pinyon or Jeffrey pine forest from approximately 5,900 to 9,300 feet above msl and is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). This species was reported and mapped on the project site by Michael Brandman Associates (MBA) (MBA 2000) and the California Natural Diversity Data Base (CDFG 2001). Botanical surveys in 2002 identified populations of this species throughout approximately 11.8 acres of pebble plain and open Jeffrey pine forest in the western half of the project site where it appears to be parasitizing Wright's matting buckwheat (see Exhibit 3). Populations of this species were found to be more widespread than reported previously and would be expected to occur in higher concentrations within the mapped Wright's matting buckwheat areas during normal rainfall years.

San Bernardino Mountain Owl's Clover (*Castilleja applegateii* ssp. *martinii*)

San Bernardino Mountain owl's clover is a CNPS List 1B species that typically blooms between June and August. This hemiparasitic, annual herb occurs in mesic chaparral, meadows and seeps, pebble plain, and upper montane coniferous forests from approximately 4,200 to 7,850 feet above msl. It is a California endemic found in Riverside and San Bernardino counties. This species was not observed during the 2002 botanical surveys. However, it has a high potential to occur on the project site given the availability of suitable habitat throughout the project site, especially within pebble plains and open Jeffrey pine forest where Wright's matting buckwheat occurs.

Male Fern (*Dryopteris filix-mas*)

Male fern is a CNPS List 2 species that is typically fertile from July to September. This rhizomatous, perennial herb occurs in granitc, rocky soils of upper montane coniferous forests from approximately 7,800 to 10,200 feet above msl. This species is known from only two locations in the White Mountains and Holcomb Valley in Inyo and San Bernardino counties respectively. The project site provides suitable habitat; however, the project site is outside the known range of this local rarity and the potential for occurrence is considered to be low.

San Bernardino Mountains Dudleya (*Dudleya abramsii* ssp. *affinis*)

The San Bernardino Mountains dudleya is a CNPS List 1B species that typically blooms from April to June. This perennial herb occurs in granitic, quartzite, or carbonate soils of pebble plain, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,800 to 8,500 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be moderate.

Leafy Buckwheat (*Eriogonum foliosum*)

Leafy buckwheat is a CNPS List 1B species that typically blooms from July to October. This annual herb occurs in sandy soils of chaparral, lower montane coniferous forest, and pinyon-juniper woodland from approximately 3,900 to 7,200 feet above msl. This species is found in scattered locations from Big Bear Valley south to Baja California. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Southern Mountain Buckwheat (*Eriogonum kennedyi* var. *austromontanum*)

Southern mountain buckwheat is a federally-listed Threatened and CNPS List 1B species that typically blooms between June and August. It is a mat-forming, woody perennial endemic to pebble plain habitats in Big Bear and Holcomb valleys in the San Bernardino Mountains from approximately 5,800 to 7,500 feet above msl. This species often serves as a host plant for the hemi-parasitic ash-gray Indian paintbrush and is also a food plant for the recently described, locally-endemic San Bernardino blue butterfly (*Euphilotes bernardino bernardino*). It is very similar to the more common Wright's matting buckwheat which is common on the project site. Southern mountain buckwheat was not seen during the 2002 botanical surveys and it has not been reported on the project site by other botanists (MBA 2000; CDFG 2001). However, it is considered to have a low potential to occur given that suitable habitat occurs within pebble plains on the project site.

Southern Sierra Woolly Sunflower (*Eriophyllum lanatum* var. *obovatum*)

Southern Sierra woolly sunflower is a CNPS List 4 species that typically blooms from June to July. This perennial herb occurs in lower and upper montane coniferous forest from approximately 4,200 to 8,100 feet above msl. This species is found in the southern Sierra Nevada and western San Bernardino mountains. The project site provides suitable habitat for this species; however, the project site is on the margin of this species geographic range and the potential for occurrence is considered to be low.

Jepson's Bedstraw (*Galium jepsonii*)

Jepson's bedstraw is a CNPS List 4 species that typically blooms from July to August. This rhizomatous, perennial herb occurs in granitic, rocky or gravelly soils in lower and upper montane coniferous forests from approximately 6,500 to 8,100 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Johnston's Bedstraw (*Galium johnstonii*)

Johnston's bedstraw is a CNPS List 4 species that typically blooms from June to July. This perennial herb occurs in chaparral, lower montane coniferous forest, pinyon-juniper woodland, and riparian woodland from approximately 5,300 to 7,500 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

San Bernardino Mountains Gilia (*Gilia leptantha* ssp. *leptantha*)

San Bernardino Mountains gilia is a List 1B species that typically blooms from June to August. This annual herb occurs in sandy or gravelly soils of lower montane coniferous forests from approximately 5,000 to 7,700 feet above msl. This species is endemic to the upper Santa Ana River watershed in the San Bernardino Mountains. The project site provides suitable habitat for this species; however, it has not been recorded in the Big Bear valley and the potential for occurrence is considered to be low.

Shaggy-Haired Alumroot (*Heuchera hirsutissima*)

Shaggy-haired alumroot is a CNPS List 1B species that typically blooms from May to July. This rhizomatous, perennial herb occurs in rocky soils of subalpine coniferous forest, and upper montane coniferous forest above approximately 7,200 feet above msl. This species is endemic to the San Jacinto and Santa Rosa mountains with one uncomfirmed record for the San Bernardino Mountains. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be low.

Parish's Alumroot (*Heuchera parishii*)

Parish's alumroot is a CNPS List 1B species that typically blooms from June to July. It is a rhizomatous perennial herb that occurs in rocky soils of alpine boulder and rock fields, lower montane coniferous forest, subalpine coniferous forest, and upper montane coniferous forest above approximately 4,800 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be low.

Silver-Haired Ivesia (*Ivesia argyrocoma*)

Silver-haired ivesia is a CNPS List 1B species that typically blooms between June and August. This perennial herb occurs in alkaline meadows and seeps, pebble plains, and upper montane coniferous forest from approximately 4,900 to 8,800 feet above msl. It occurs in the San Bernardino Mountains and a disjunct population occurs in the mountains of Baja California. This species was reported on the project site by MBA (MBA 2000) and was observed throughout mapped pebble plain habitat on the project site during the 2002 botanical surveys.

Duran's Rush (*Juncus duranii*)

Duran's rush is a CNPS List 4 species that typically blooms from July to August. It is a rhizomatous, perennial herb that occurs in mexic soils of lower montane coniferous forest, meadows and seeps, and upper montane coniferous forest from approximately 5,800 feet to 9,000 feet above msl. This species is found in the San Bernardino, San Gabriel, and San Jacinto mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Short-Sepaled Lewisia (*Lewisia brachycalyx*)

Short-sepaled lewisia is a CNPS List 2 species that typically blooms from May to June. It is a perennial herb that occurs in mesic meadows and seeps, and lower montane coniferous forest from 4,500 to 7,500 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be moderate.

Lemon Lily (*Lilium parryi*)

Lemon lily is CNPS List 1B species that typically blooms from July to August. It is a bulbiferous, perennial herb that occurs in lower and upper montane coniferous forests, meadows and seeps, and riparian scrub above approximately 4,000 feet above msl. This species is found in the mountain ranges of southern California and southeastern Arizona. The project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be low.

Baldwin Lake Linanthus (*Linanthus killipii*)

The Baldwin Lake linanthus is a CNPS List 1B species that blooms from May to July. It is an annual herb that occurs in alkaline meadows and seeps, pebble plain, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,500 to 7,800 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

San Bernardino Mountain Monkeyflower (*Mimulus exiguus*)

The San Bernardino Mountain monkeyflower is a CNPS List 1B species that typically blooms from June to July. It is an annual herb that occurs in mesic, clay soils of meadows and seeps, pebble plain, and upper montane coniferous forest between approximately 5,800 and 7,500 feet above msl. This species is found in the San Bernardino Mountains and high mountains of Baja California. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Purple Monkeyflower (*Mimulus purpureus* var. *purpureus*)

Purple monkeyflower is a CNPS List 2 species that typically blooms from May to July. It is an annual herb that occurs in meadows and seeps, pebble plain, and upper montane coniferous forest from approximately 6,100 to 7,500 feet above msl. This species is found in the San Bernardino Mountains and high mountains of Baja California. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Baja Navarretia (*Navarretia peninsularis*)

Baja navarretia is a CNPS List 1B species that blooms from July to September. It is an annual herb that occurs in mesic, sandy soils in chaparral and lower montane coniferous forests between approximately 4,800 and 7,500 feet above msl. This species is found in the mountains of central and southern California and north Baja California. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be low.

Chickweed Oxytheca (*Oxytheca caryophylloides*)

Chickweed oxytheca is a CNPS List 4 species that typically blooms from July to September. It is an annual herb that occurs in sandy soils of lower montane coniferous forest from approximately 3,900 to 8,500 feet above msl. This species is found in the southern Sierra Nevada, Transverse Ranges, and San Jacinto Mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Cienega Seca Oxytheca (*Oxytheca parishii* var. *cienegensis*)

The cienega seca oxytheca is a CNPS List 1B species that typically blooms from June to September. It is an annual herb that occurs in sandy, granitic soils in upper montane coniferous forest from approximately 7,000 to 8,000 feet above msl. This species is found along Coon Creek and Cienega Seca Creek in San Bernardino County. The project site provides suitable habitat for this species; however, the project site is well outside the known geographic range for this species and the potential for occurrence is considered to be low.

Parish's Yampah (*Perideridia parishii* ssp. *parishii*)

Parish's yampah is a CNPS List 2 species that typically blooms from June to August. It is a perennial herb that occurs in lower and upper montane coniferous forests, and meadows and seeps above approximately 6,500 feet above msl. This species is found in the San Bernardino Mountains and in disjunct populations in Arizona and New Mexico. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Transverse Range Phacelia (*Phacelia exilis*)

The Transverse Range phacelia is a CNPS List 4 species that typically blooms from May to August. It is an annual herb that occurs in sandy or gravelly soils in lower and upper montane coniferous forests, and meadows and seeps from approximately 3,500 to 8,500 feet above msl. This species is found in the southern Sierra Nevada and Transverse Ranges. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Mojave Phacelia (*Phacelia mohavensis*)

The Mojave phacelia is a CNPS List 4 species that typically blooms from April to August. It is an annual herb that occurs in sandy or gravelly soils of cismontane woodland, lower montane coniferous forest, meadows and seeps, and pinyon-juniper woodland from approximately 4,500 to 8,100 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Bear Valley Phlox (*Phlox dolichantha*)

The Bear Valley phlox is a CNPS List 1B species that blooms from June to July. It is a perennial herb that occurs in pebble plain, and upper montane coniferous forest from approximately 6,500 to 8,800 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

San Bernardino Bluegrass (*Poa atropurpurea*)

San Bernardino bluegrass is a federally-listed Endangered and CNPS List 1B species that typically blooms from May to June. It is a rhizomatous, perennial herb that occurs in mesic meadows and seeps between approximately 4,800 and 7,200 feet above msl. This species is found in the San Bernardino and Laguna mountains (San Diego). The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Bear Valley Pyrrocoma (*Pyrrocoma uniflora* ssp. *gosssypina*)

Bear Valley pyrrocoma is a CNPS List 1B species that typically blooms from July to August. It is a perennial herb that occurs in meadows and seeps, and pebble plain from approximately 5,200 to 7,600 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Parish's Rupertia (*Rupertia rigida*)

Parish's rupertia is a CNPS List 4 species that typically blooms from June to July. It is a perennial herb that occurs in chaparral, cismontane woodland, and lower montane coniferous forest below approximately 8,100 feet above msl. This species is found in the San Bernardino Mountains, Peninsular Ranges, and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Bluish Spike-Moss (*Selaginella asprella*)

Bluish spike-moss is a CNPS List 4 species that typically blooms in July. It is a rhizomatous, perennial herb that occurs in granitic, rocky soils of cismontane woodland, lower and upper montane coniferous forests, pinyon-juniper woodland, and subalpine coniferous forest between approximately 5,200 to 8,800 feet above msl. This species occurs throughout southern California mountain ranges and Baja California. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be low.

San Bernardino Butterweed (*Senecio bernardinus*)

San Bernardino butterweed is a CNPS List 1B species that typically blooms from May to July. It is a perennial herb that occurs in meadows and seeps, pebble plain, and upper montane coniferous forest between approximately 5,800 to 7,500 feet above msl. This species is endemic to the San Bernardino Mountains and is known from fewer than twenty occurrences. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be low.

Parish's Checkerbloom (*Sidalcea hickmanii* ssp. *parishii*)

Parish's checkerbloom is a federal Candidate for listing as Threatened or Endangered, state Rare, and CNPS List 1B species that typically blooms from June to July. It is a perennial herb that occurs in chaparral, cismontane woodland, and lower montane coniferous forest between 3,200 and 8,200 feet above msl. This species is found mainly in the San Bernardino Mountains and in a few localities in the Santa Ynez Mountains. The project site provides limited suitable habitat for this species and potential for occurrence is considered to be low.

Bird's Foot Checkerbloom (*Sidalcea pedata*)

Bird's foot checkerbloom is a federally- and state-listed Endangered and CNPS 1B species that typically blooms from May to July. It is a perennial herb that occurs in meadows and seeps, and pebble plain between approximately 5,200 and 8,100 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides marginally suitable habitat for this species and the potential to occur is considered to be low to moderate.

Prairie Wedge Grass (*Sphenopholis obtusata*)

Prairie wedge grass is a CNPS List 2 species that typically blooms from April to July. It is a perennial herb that occurs in mesic soils of cismontane woodland, meadows and seeps between approximately 1,000 and 6,550 feet above msl. This species is found in a few widely scattered locations in Amador, Fresno, Inyo, Mono, Riverside, and San Bernardino counties in California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Laguna Mountains Jewelflower (*Streptanthus bernardinus*)

The Laguna Mountains jewelflower is a CNPS List 4 species that typically blooms from June to July. It is a perennial herb that occurs in chaparral, and lower montane coniferous forest between approximately 3,900 and 8,100 feet above msl. This species is found in the Transverse and Peninsular ranges and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Southern Jewelflower (*Streptanthus campestris*)

The southern jewelflower is CNPS List 1B species that typically blooms from May to July. It is a perennial herb that occurs in rocky soils of chaparral, lower montane coniferous forest, and pinyon-juniper woodland from approximately 2,900 to 7,500 feet above msl. This species is known from fewer than twenty occurrences in Riverside, San Bernardino, and San Diego counties, and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Pine Green-Gentian (*Swertia neglecta*)

Pine green-gentian is a CNPS List 4 species that typically blooms from May to July. It is a perennial herb that occurs in lower and upper montane coniferous forests, and pinyon-juniper woodlands from approximately 4,500 to 8,100 feet above msl. This species is found in the South Coastal and Transverse ranges within Los Angeles, San Bernardino, and Ventura counties. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

California Dandelion (*Taraxacum californicum*)

The California dandelion is a federally-listed Endangered and CNPS List 1B species that typically blooms from May to July. It is a perennial herb that occurs in mesic meadows and seeps from approximately 6,300 to 7,800 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be low to moderate.

Slender-Petaled Thelypodium (*Thelypodium stenopetalum*)

Slender-petaled thelypodium is a federally- and state-listed Endangered and CNPS List 1B species that typically blooms from June to July. It is a perennial herb that occurs in mesic, alkaline meadows and seeps from approximately 6,200 to 7,200 feet above msl. This species is endemic to the San Bernardino Mountains with less than eight known populations in the Big Bear and Holcomb valleys. The project site contains marginally suitable habitat for this species and the potential to occur is considered to be low.

Small-Flowered Bluecurls (*Trichostema micranthum*)

Small-flowered bluecurls is a CNPS List 4 species that typically blooms from July to September. It is an annual herb that occurs mesic soils in lower montane coniferous forest, and meadows and seeps from 6,500 to 7,500 feet above msl. This species is found in the San Bernardino Mountains and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Grey-Leaved Violet (*Viola pinetorum* ssp. *grisea*)

Grey-leaved violet is a CNPS List 1B species that typically blooms in April. It is a perennial herb that occurs in meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest from approximately 4,800 to 11,100 feet above msl. This species is known from ten occurrences in Fresno, Kern, San Bernardino, and Tulare counties. There is disagreement about the range of this species. The project site provides suitable habitat for this species; however, the project site is outside the known geographic range for this species and the potential to occur is considered to be low.

3.3.4 Special Status Wildlife

Fifty-three special status wildlife species are known to occur within the region, 39 of which have the potential to occur within the project site. Focused surveys for the bald eagle, California spotted owl, southwestern willow flycatcher, and southern rubber boa were conducted in the winter, spring, summer, and fall of 2002 (Appendices B-E). A brief description of the special status wildlife species that were determined to have potential to occur on the project site are listed below. Wildlife species

are grouped by type and listed alphabetically according to their scientific name. These species are summarized in Table 3.

Invertebrates

Andrew's Marble Butterfly (*Euchloe hyantis* ssp. *andrewsi*)

Andrew's marble butterfly is a federal Species of Concern. This species is found at elevations above 5,000 feet above msl near Lake Arrowhead and Big Bear Lake, and in other locations across the San Bernardino Mountains crest and north slopes. It is found primarily in pine and mixed conifer forests (Murphy 1990). The larval host plants for this subspecies are the Laguna Mountains jewelflower and *Arabis holboellii*. The project site provides limited suitable habitat for this species; however, the project site is above the known elevation range. The potential for this butterfly species to occur is considered to be low.

Amphibians

Yellow-Blotched Salamander (*Ensatina escholtziii croceater*)

The yellow-blotched salamander is a federal Species of Concern and state Species of Special Concern. This species is found at elevations up to 8,000 feet above msl among rotting logs and leaf litter in mixed stands of oaks and conifers. The project site provides limited, marginally suitable habitat and the potential for it to occur is considered to be low.

Reptiles

Silvery Legless Lizard (*Anniella pulchra pulchra)*

The silvery legless lizard is a federal Species of Concern and a state Species of Special Concern. The silvery legless lizard inhabits areas with moist sandy soil, including dry washes, woodlands, riparian, and scrub communities at elevations ranging from sea level to about 5,000 feet above msl (Stebbins 1985). The project site provides a limited amount of potentially suitable habitat for this species; however, the project site is above the known elevation range for this species and its potential to occur is considered to be low.

Southern Rubber Boa (*Charina bottae umbbricata*)

The southern rubber boa is a federal Species of Concern and state-listed Threatened species found in the San Bernardino and San Jacinto mountains at elevations between 4,900 and 7,900 feet above msl. The majority of the localities for this species are in a 10-mile long strip between Twin Peaks in the west to Green Valley in the east of the San Bernardino Mountains (Stewart 1988). Known locations for this species occur on the north-facing slopes immediately south of Big Bear

Lake. This species usually occurs in moist woodlands and coniferous forests with deep, well developed soils (Loe 1985). It is a burrower and also commonly makes use of rock out crops for hibernation. Large downed logs and a well-developed litter layer are considered important for cover and for maintaining soil moisture. Surveys for this species were conducted in the spring and summer of 2002 by BonTerra Consulting. The final survey report is presented in Appendix B. No southern rubber boas were encountered during surveys. Given the lack of historical records in the immediate vicinity of the project site, and the negative results of two independent focused survey techniques, the southern rubber boa is not expected to occur on the project site.

Coastal Western Whiptail (*Cnemidophorus tigris multiscutatus*)

The coastal western whiptail is a federal Species of Concern. It is a moderately large, slender lizard typically found in open scrub, chaparral, and woodland communities in semi-arid areas or where vegetation is sparse, from below sea level to 7,000 feet above msl (Stebbins 1985). This species is restricted to the western coast of North America from Ventura County south through the northern two-thirds of the Baja California peninsula. The project site provides suitable habitat for this species; however, it is at the maximum elevation for this species and its potential to occur is considered to be moderate.

San Bernardino Ringneck Snake *(Diadophis punctatus modestus*)

The San Bernardino ringneck snake is a federal Species of Concern and is considered locally rare in southwestern California. It inhabits scrub, chaparral, native grassland, and woodland communities. This species is difficult to detect due to its secretive behavior. It occurs in elevations from sea level to 7,000 feet above msl (Stebbins 1985). The project site provides limited suitable habitat for this species and its potential to occur is considered to be low.

San Bernardino Mountain Kingsnake (*Lampropeltis zonata parvirubra*)

The San Bernardino mountain kingsnake is a federal Species of Concern that occurs in the San Jacinto, San Bernardino, and San Gabriel mountains. This species typically occurs in open stands of ponderosa pine, Jeffrey pine, Coulter pine, and/or black oak at elevations ranging from 4,500 to 6,500 feet above msl. This species occurs at higher elevations, but is less common. Partially shaded rock outcrops appear to be an important microhabitat element for refugia and basking sites (McGurty 1988). The project site provides marginally suitable habitat for this species and its potential to occur is considered to be moderate.

Southern Sagebrush Lizard (*Sceloporus graciosus vandenbergianus*)

The southern sagebrush lizard is a federal Species of Concern that occurs in open coniferous forests and shrubland above 3,000 feet above msl. Its known range extends from Mount Pinos south to Baja California. This species inhabits mixed conifer forest, black oak woodlands, montane

chaparral, and pinyon-juniper woodlands (Zeiner et al. 1988). This species was observed frequently on the project site.

Birds

Cooper's Hawk (*Accipiter cooperii*)

The Cooper's hawk is a state Species of Special Concern. Both resident and migratory populations exist in San Bernardino County. Wintering Cooper's hawks are often seen in wooded urban areas and native woodland communities. Preferred nesting habitats include riparian forests, mountain canyons, and oak woodlands. Cooper's hawks in the region prey on small birds and rodents that live in woodland and, occasionally, scrub and chaparral communities. Breeding residents have been observed in the vicinity of Big Bear Lake. The project site provides suitable foraging habitat, but a limited amount of nesting habitat for this raptor. Therefore, its overall potential to occur is considered to be high, although the potential for nesting is moderate.

Northern Goshawk (*Accipiter gentilis*)

The northern goshawk is a federal Species of Concern and state Species of Special Concern. Rare in southern California, goshawks have been observed during the breeding season only on Mount Abel, Mount Pinos, and in the San Bernardino and San Jacinto mountains (Garrettt and Dunn 1981). Breeding has not been documented in the San Bernardino Mountains, although goshawks have been observed near Big Bear Lake (Garrett and Dunn 1981). Goshawks occur in a variety of coniferous forest communities, including ponderosa and Jeffrey pine, mixed conifer, white fire and lodgepole pine. Large snags and downed logs are believed to be important habitat elements because they increase the abundance of small- to medium sized birds and mammals composing this species prey base (Reynolds et al. 1992). Limited suitable foraging habitat is present on the project site and the potential for this species is considered moderate for foraging, but no potential for nesting.

Sharp-shinned Hawk (*Accipiter striatus*)

The sharp-shinned hawk is a state Species of Special Concern. This raptor is a fairly common winter visitor throughout southern California (Garrett and Dunn 1981). It prefers woodland communities, but can also be found in virtually any habitat as it passes through the area during migration. The sharp-shinned hawk is a fairly common winter visitor in the Big Bear Lake vicinity, and its potential to occur for foraging is considered to be high. However, the project site provides no nesting habitat for this raptor.

Golden Eagle (*Aquila chryysaetos*)

The golden eagle is a state Species of Special Concern. This raptor is uncommon, but widely distributed throughout foothill, lower montane, and desert montane habitats in southern California. Golden eagles nest primarily on cliffs and hunt for rabbits and other small mammals in open habitats succh as grasslands, oak savannas, and open shrublands. No nesting habitat is present on the project site; however, the potential for foraging on the project site is considered high.

Long-eared Owl (*Asio otus)*

The long-eared owl is a state Species of Special Concern. It breeds and roosts in riparian forests and woodlands or other dense forest habitats. This owl forages at night in open habitats including marshes, grasslands, and agricultural fields. It occurs throughout North America but is an increasingly rare breeder in southern California. The project site provides moderate suitable foraging habitat and limited nesting habitat, for this species.

Ferruginous Hawk (*Buteo regalis*)

The ferruginous hawk is a federal Species of Concern and a state Species of Special Concern. Ferruginous hawks occur from mid-fall through early spring in coastal southern California. They forage over grasslands and the ecotone between scrub and grasslands. The project site provides a limited amount of suitable foraging habitat, but no nesting habitat, for this species. Therefore, its potential to occur on the project site is considered to be low for foraging, with no potential for nesting.

Northern Harrier (*Circus cyaneus*)

The northern harrier is a state Species of Special Concern. It is a regular winter migrant that occasionally breeds along the coast of southern California. Foraging habitat consists of marsh, grassland, and scrub habitats. The project site provides limited suitable foraging habitat, but no nesting habitat, for this raptor. Therefore, its potential to forage on the project site is considered to be low.

Black Swift (*Cypseloides niger*)

The black swift is a state Species of Special Concern. It is known to breed in the San Gabriel Mountains, Mill Creek Canyon in the San Bernardino Mountains, and the San Jacinto Mountains. This species occurs in mountain and foothill canyons where it nests in rocky cliffs behind waterfalls. No suitable nesting habitat is present on the project site; however, this project site could provide suitable foraging habitat and the potential for this species to forage on the project site is considered moderate.

Yellow Warbler (*Dendroica petechia*)

The western yellow-warbler is a California Species of Special Concern. This subspecies of yellow warbler that breeds in southern California is the western yellow warbler (*D.p. brewsteri*) (Dunn and Garrett 1997). This subspecies occurs in coastal areas from northwestern Washington south to western Baja California (Dunn and Garrett 1997). In southern California, yellow warblers breed locally in riparian woodlands. The yellow warbler is an abundant migrant and would be expected to occur in spring and fall during migration. No suitable nesting habitat is present on the project site; however, the potential for foraging migrants on the project site is considered moderate.

White-Tailed Kite (*Elanus leucereus*)

The white-tailed kite is a California Fully Protected species. This raptor typically nests in oaks, willows, and sycamores, and forages within adjacent grassland and scrub habitats. White-tailed kites show strong site fidelity to nest groves and trees. The most abundant prey species for this raptor includes the California vole, western harvest mouse, and house mouse. The project site provides limited suitable foraging and nesting habitat for this raptor. Therefore, its potential to occur on the project site is considered to be low for nesting and foraging.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The southwestern willow flycatcher is a federally- and state-listed Endangered species. This subspecies has declined drastically due to a loss of breeding habitat and nest parasitism by brown-headed cowbirds. This species occurs in riparian habitats along rivers, streams, or other wetlands where dense growths of willows (*Salix* sp.), baccharis (*Baccharis* sp.), arrowweed (*Pluchea* sp.), tamarisk (*Tamarix* sp.), or other plants are present, often with a scattered overstory of cottonwood (*Populus* sp.) (USFWS February 27, 1995). The potential for this species to occur on the project site as a foraging migrant is considered to be high, but its potential to nest on the project site is considered low. Surveys for this species were conducted in the spring and summer of 2002 by BonTerra Consulting. No breeding or individual southwestern willow flycatchers were detected during the surveys. Willows along the shoreline are patchy and lack the dense growth or willow thicket favored by this species as territorial or breeding habitat. Therefore, breeding southwestern willow flycatchers are not expected to occur on the project site.

Merlin (*Falco columbaris*)

The merlin is a state Species of Special Concern. In California, the merlin prefers vast open space areas such as estuaries, grasslands, and deserts where it hunts small flocking birds such as sandpipers, larks, sparrows, and pipits. The merlin is a very rare winter visitor to the Big Bear Lake area. The project site provides suitable foraging habitat and perching locations, but no nesting habitat, for this raptor. Therefore, its potential to occur for foraging is considered to be low, and there is no potential for nesting.

Prairie Falcon (*Falco mexicanus*)

The prairie falcon is a state Species of Special Concern. It is now a rare visitor to the coastal plain of southern California. Foraging habitat for this species consists of open habitats such as deserts, grasslands, rangelands, and marshes. For nesting, this large falcon uses ledges of cliff faces. The project site provides suitable foraging habitat for this raptor, but no potentially suitable nesting habitat. Therefore, its potential to occur is considered to be low for foraging only.

American Peregrine Falcon (*Peregrinus anatum*)

The peregrine falcon is a state-listed Endangered species that, due to recent population gains, has been recently delisted as Endangered by the USFWS. No such delisting has been proposed by the state. Peregrine falcons prey almost exclusively on birds and use a variety of habitats, particularly wetlands and coastal areas, and nest on cliffs or building ledges. The project site provides limited suitable foraging habitat for the peregrine falcon, but no potentially suitable nesting habitat. Therefore, its potential to occur on the project site is considered to be low for foraging only.

Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is a state- and federally-listed Endangered species. This raptor typically overwinters in small numbers in southern California near lakes and reservoirs where they feed on fish, coots, and waterfowl (Garrett and Dunn 1981). The largest known wintering population in southern California is at Big Bear Lake in the San Bernardino Mountains, where twenty to thirty eagles typically congregate from November to March. This species is known to be present on the project site in winter but is not expected to nest on the project site. Surveys and records searches were conducted on the project site in the winter of 2002 by BonTerra Consulting to determine bald eagle use of perch trees and favored roosting locations. The final survey report is presented in Appendix E. The surveys found that the site was used extensively by bald eagles. Bald eagle perch and roost locations were recorded and individual trees were marked with numbered tags. Tree locations are shown on Exhibit 3. The records search confirmed extensive use of the project site by bald eagles and found that the most commonly recorded use of a single tree was also on the project site.

Hepatic Tanager (*Piranga flava*)

The hepatic tanager is a state Species of Special Concern. In southern California, this species is known to breed only in the San Bernardino Mountains (Garrett and Dunn 1981). Breeding habitat consists of mature pinyon pine woodland with a mixture of taller conifers such as white fir or Jeffrey pine. Johnson and Garrett (1974) suggest this species may also occur in pine and deciduous oak woodlands on warm, arid slopes. The project site provides limited suitable foraging and nesting habitat for this species and potential for occurrence is considered to be low for foraging and nesting.

Purple Martin (*Progne subis*)

The purple martin is a state Species of Special Concern that historically occurred throughout all of the major mountain ranges in southern California. Many historic localities are no longer occupied and there are no known active localities in the San Bernardino Mountains (Garrett and Dunn 1981). This species is a secondary cavity nester of hardwood and conifer forests. The project site provides suitable habitat for this species; however, given the lack of records in the vicinity, the potential for occurrence is considered to be low for foraging and nesting.

California Spotted Owl (*Strix occidentalis occidentalis*)

The California spotted owl is a federal Species of Concern and state Species of Special Concern. This species occurs in all of the major mountain ranges in southern California, although some ranges support very few pairs. It is found at elevations ranging from below 1,000 feet to 8,500 feet above msl in mature forests typically with a dense, multi-layered canopy. Its prey base consists of woodrats (i.e., *Neotoma* spp.) and other rodents. Surveys were conducted for this species on the project site by BonTerra Consulting in the spring and summer of 2002. The final survey report is provided in Appendix D. Although one male spotted owl was detected approximately one mile to the northwest of the project site, no nesting pairs or individuals were observed on the project site. Therefore, no nesting pairs presently occur on the project site; however, individuals have a high potential to forage on the project site.

Gray Vireo (*Vireo vicinior*)

The gray vireo is a state Species of Special Concern. This species is a summer resident in a few highly localized areas on the coastal mountain ranges in southern California. It occurs on dry, desert-facing slopes in the San Gabriel, San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981). This species prefers stands of dense, mature chaparral dominated by chamise or redshank or on brushy slopes in pinyon-juniper woodlands. The project provides limited, marginal habitat for this species. The potential for occurrence is considered to be low for foraging but there is no potential for breeding on the project site.

Mammals

Pallid Bat (*Antrozus pallidus*)

The pallid bat is a California Species of Special Concern that most commonly occurs in mixed oak and grassland habitats. This large bat roosts in rock crevices and in cavities of trees, especially oaks. The project site provides potentially suitable roosting and foraging habitat for this species and it has a low potential to occur.

Spotted Bat (*Euderma maculatum*)

The spotted bat is a federal Species of Concern and state Species of Special Concern. Little is known about its distribution. Spotted bats forage in a wide variety of habitats but roost strictly in cliffs. The project site would provide foraging habitat for this species and it has a moderate potential to occur for foraging; however, no suitable roosting habitat is present.

California Mastiff Bat (*Eumops perotis californicus*)

The California mastiff bat, the largest bat in the United States, is a federal Species of Concern and a California Species of Special Concern. This species is a very wide-ranging and high-flying insectivore that typically forages in open areas with high cliffs. It roosts in crevices in small colonies. The project site would provide limited foraging habitat for this species and it has a low potential to occur for foraging; however, no suitable roosting habitat is present.

San Bernardino Mountain Flying Squirrel (*Glaucomys sabrinus californicus*)

The San Bernardino Mountain flying squirrel is a federal Species of Concern and state Species of Special Concern. It occurs in the San Bernardino Mountains between 5,200 and 8,500 feet above msl. This species prefers mid- to upper-elevation, dense, mature coniferous forest habitats, particularly those containing white fir. They use cavities in large trees, snags, and logs for cover. The project site provides suitable foraging habitat for this species and the potential for occurrence is considered high; however, the potential for this species to breed on the project site is considered to be low as this species prefers to breed in relatively dense coniferous forests in proximity to riparian areas.

Small-footed Myotis (*Myotis ciliolabrum*)

The small-footed myotis is a federal Species of Concern that occurs throughout much of the western United States, occupying a variety of habitats. This species feeds among trees or over brush, and roosts in cavities of cliffs, trees, or rocks and within caves or mine shafts. The project site provide potentially suitable roosting and foraging habitat for this species and the potential for occurrence is considered to be low for roosting and high for foraging.

Long-eared Myotis (*Myotis evotis*)

The long-eared myotis is a federal Species of Concern that is restricted to high-elevation habitats. It is known to occur in Coon Creek in the San Bernardino National Forest. This species can occur in a variety of habitats, but are usually associated with coniferous forests where they roost under exfoliating tree bark. The project site provides potentially suitable roosting and foraging habitat for this species and the potential for occurrence is considered to be high for foraging and roosting.

Occult Little Brown Bat (*Myotis lucifugus*)

The occult little brown bat is a federal Species of Concern and state Species of Special Concern that is restricted to high-elevation habitats. This species occurs in pine forests at elevations ranging from 6,000 to 9,000 feet above msl. It roosts in buildings, trees, and cliffs and feeds over water or open sites. The project site provides suitable roosting and foraging habitat and the potential for this species to occur is considered to be high for foraging and roosting.

Fringed Myotis (*Myotis thysanodes*)

The fringed myotis is a federal Species of Concern that is restricted to high-elevation habitats. This species has been observed on Arrastre Creek on the San Bernardino National Forest (USDA 1999). It occurs in a wide variety of habitats but is most commonly found in dry pine or mixed conifer forests and pinyon-juniper woodlands where it will roost in caves, buildings, mine shafts, rock crevices in cliff faces, trees, and bridges. Hibernation has only been documented in buildings and mines (Miner and Brown 1996). The project site provides marginally suitable roosting and foraging habitat for this species and potential for occurrence is considered to be moderate for foraging and low for roosting.

Long-legged Myotis (*Myotis volans*)

The long-legged myotis is a federal Species of Concern that is restricted to high-elevation habitats. This species has been observed on Arrastre Creek on the San Bernardino National Forest (USDA 1999). It is primarily a bat of coniferous forests but also occurs seasonally in riparian and desert habitats. It uses abandoned buildings, cliff crevices, exfoliating tree bark, and hollows within snags as summer day roosts; caves and mine tunnels for hibernation. The project site provides marginally suitable foraging and roosting habitat for this species and its potential to occur on the project site is considered to be moderate for foraging and roosting.

Yuma Myotis (*Myotis yumanensis*)

The Yuma myotis is a federal Species of Concern and a relatively small bat that occurs statewide. This species is closely associated with water and wooded canyon bottoms throughout its range. Caves and old buildings are preferred roosting habitats, with roosts numbering up to 2,000 individuals. The project site provides potentially suitable foraging habitat for this species and the potential for this species to forage on the project site is considered to be moderate; however, this species is not expected to roost on the project site.

Pacific Western Big-eared Bat (*Plecotus townsendii pallescens*)

The Pacific western big-eared bat occurs throughout California and is a federal Species of Concern and state Species of Special Concern. In the southern portion of the state, the subspecies, *P. T.*

pallescens (Hall 1981), occupies a variety of communities, including oak woodlands, arid deserts, grasslands, and high-elevation forests and meadows. Known roosting sites in California include mines, caves, and buildings. The project site would provide foraging habitat for this species and it has a moderate potential to forage on the project site; however, no suitable roosting habitat is present.

3.3.5 Applicable Regional and Local Policies and Plans

San Bernardino Valley Multi-Species Habitat Conservation Plan

The draft Multi-Species Habitat Conservation Plan (MSHCP) encompasses approximately 500 square miles in the valley floor of the southwestern corner of San Bernardino County. The draft MSHCP area contains six unique habitat types, thirteen federally-listed Endangered or Threatened species, six state-listed Endangered or Threatened species, and fifty-three species of concern to federal and state agencies. San Bernardino County, through their Natural History Museum Staff, has been conducting biological and botanical surveys for the past several years in order to identify habitat needs and requirements for various sensitive species. The project site is not encompassed by the draft MSHCP and would not be subject to its policies and provisions.

County of San Bernardino General Plan

The County of San Bernardino general plan contains goals and policies/actions designed to preserve biological resources that apply to development within the County's jurisdiction. The general plan contains a list of Rare, Endangered and Threatened species that occur in San Bernardino County, adverse effects on which result in a mandatory finding of significant effect pursuant to State CEQA Guidelines, Section 15065 if individuals are adversely affected by County land use map changes and discretionary land use approvals, thereby requiring the preparation of an Environmental Impact Report (EIR). Listed plant species identified within the General Plan with potential to occur on the project site include Parish's checkerbloom and bird's foot checkerbloom. Listed wildlife species identified within the General Plan with potential to occur on the project site include the southern rubber boa and bald eagle. This biological technical report has been prepared as supporting documentation for the proposed Moon Camp project EIR which satisfies the requirements of the County of San Bernardino General Plan.

County of San Bernardino Biotic Resources Overlay District

The project site lies within a County of San Bernardino Biotic Resources (BR) Overlay District. The purpose of the BR Overlay District is to "implement General Plan policies regarding the protection and conservation of beneficial rare and endangered plants and animal resources and their habitats which have been identified within unincorporated areas of the county" (Article 2, 85.030201). The County General Plan implements the intent of the BR Overlay District by requiring all proposed land uses with a minimum of 25 percent of the total proposed development area within the BR Overlay

District to prepare a biological technical report identifying impacts to biological resources and mitigation measures designed to reduce or eliminate project related impacts. This biological technical report is intended to satisfy the requirements of the BR Overlay District.

Plant Protection and Management Ordinance – County of San Bernardino Municipal Code

The County of San Bernardino dictates under Chapter 8, Division 9 of the Municipal Code (Plant Protection and Management) that development on all private and public lands within the unincorporated areas of San Bernardino County is subject to specific requirements. Removal of any native plant from unincorporated areas of San Bernardino requires the approval of a removal permit. Additionally, the following sections of the ordinance would apply to native plants on the project site:

89.0110(a) The provisions of this Division shall not authorize the removal of perch trees within identified American Bald eagle habitat.

89.0115(c) The reviewing authority may require certification from an appropriate tree expert or native plant expert that such tree removals are appropriate, supportive of a healthy environment and are in compliance with the provisions of this chapter.

89.0205 Any coniferous tree or portion thereof, including stumps, shall be treated in accordance with one of the methods specified in Sections 89.0205 and 89.0210 within fifteen (15) days after such a tree or portion of such a tree has been cut.

Migratory Bird Treaty Act (MBTA)

The MBTA established in 1918 the federal prohibition, unless permitted by regulations, to pursue, hunt, take, capture, or kill any migratory bird species or any part, nest, or egg of any such migratory bird species covered by the act. Impacts to any bird (or its nest) listed by the MBTA are considered punishable by fines and/or imprisonment. Additionally, impacts to nesting MBTA-listed species is considered a significant impact by CEQA per guideline section .

4.0 PROJECT IMPACTS

4.1 INTRODUCTION

The determination of impacts in this analysis is based on a comparison of maps depicting project grading limits and maps of onsite biological resources. All construction activities, including staging and equipment areas, are assumed to be contained within the limits of grading. Both direct and indirect impacts on biological resource have been evaluated. Direct impacts are those that involve the initial loss of habitats due to grading and construction. Indirect impacts are those that would be related to disturbance from construction activities (e.g., noise, dust) and use of the project site.

Biological impacts associated with the proposed project were evaluated with respect to the following special status biological issues:

- Federally- or state-listed Endangered or Threatened species of plant or wildlife;
- Non-listed species that meet the criteria in the definition of Rare or Endangered in the California Environmental Quality Act (CEQA) Guidelines;
- Streambeds, wetlands, and their associated vegetation;
- Habitats suitable to support a federally- or state-listed Endangered or Threatened species of plant or wildlife;
- Species designated as California Species of Special Concern or federal Species of Concern;
- Habitat, other than wetlands, considered special status by regulatory agencies (USFWS, CDFG) or resource conservation organizations; and
- Other species or issues of concern to regulatory agencies or conservation organizations.

The actual and potential occurrence of these resources within the project site was correlated with the following significance criteria to determine whether the impacts of the proposed project on these resources would be considered significant.

4.2 SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines contains the Initial Study Environmental Checklist form which includes questions relating to biological resources. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this Section. Accordingly, a project may create a significant environmental impact if one or more of the following occurs:

- If the project has a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS.
- If the project has a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFG or USFWS.
- If the project has a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh,

vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

- If the project interferes substantially with the movement of any native or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedes the use of native wildlife nursery sites.

- If the project conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

- If the project conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Section 15065(a), *Mandatory Findings of Significance*, of the CEQA Guidelines states that a project may have a significant effect on the environment if "...the project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species..."

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would substantially diminish, or result in the loss of, an important biological resource or those that would obviously conflict with local, State or Federal resource conservation plans, goals, or regulations. Impacts are sometimes locally adverse but not significant because, although they would result in an adverse alteration of existing conditions, they would not substantially diminish or result in the permanent loss of an important resource on a population- or region-wide basis.

Section 15380 of CEQA indicates that a lead agency can consider a non-listed species to be Rare or Endangered for the purposes of CEQA if the species can be shown to meet the criteria in the definition of Rare or Endangered. For the purposes of this discussion, the current scientific knowledge on the population size and distribution for each special status species was considered according to the definitions for Rare and Endangered listed in Section 15380 of CEQA.

The actual and potential occurrence of these resources within the project vicinity was correlated with the previously identified significance criteria to determine whether the impacts of the proposed project on these resources would be significant.

Potential impacts are grouped below according to topic. The numbered mitigation measures at the end of this section directly correspond with the numbered impact statements.

4.3 DIRECT IMPACTS

4.3.1 Flora and Vegetation Type Impacts

A total of 61.87 acres of native and non-native vegetation types, including developed areas, would be impacted by the proposed project. These areas are discussed below, summarized in Table 4 and illustrated in Exhibit 4.

Jeffrey Pine Forest

A total of 54.91 acres of Jeffrey pine forest, including 17.38 acres of open Jeffrey pine forest, would be impacted by project implementation. Approximately 58,526 acres of Jeffrey pine forest occurs in the San Bernardino National Forest and 141,604 acres in the Cleveland, San Bernardino, Angeles and Los Padres National Forests collectively (Stephenson and Calcarone 1999). Impacts on this vegetation type would be considered less than significant since this vegetation type is common throughout the San Bernardino Mountains and other mountain ranges in the region.

Lake Shoreline

A total of 4.14 acres of lake shoreline would be impacted by project implementation. Man-made lakes are essentially distinct ecosystems, with an aquatic fauna and flora that bears little resemblance to what naturally occurs in the streams that formed them. Impacts on this vegetation type would be considered less than significant since Big Bear Lake is a man-made reservoir created by the construction of Bear Valley Dam. Montane meadow habitat may occur within the lake shoreline vegetation type. Impacts to montane meadow are discussed in Section 4.3.3, Special Status Biological Resources Impacts.

Pebble Plains

A total of 0.69 acre of pebble plain habitat would be impacted by project implementation. Impacts to pebble plain habitat are discussed in Section 4.3.3, Special Status Biological Resources Impacts.

Developed

A total of 2.82 acres of disturbed vegetation and developed areas would be impacted by project implementation. Impacts on this vegetation type would not be considered significant since this vegetation type is considered to have a low biological value.

4.3.2 Fauna Impacts

To assess impacts on wildlife, the total impact on a given vegetation type that provides habitat for wildlife was evaluated. Exhibit 4 illustrates the vegetation types (i.e., wildlife habitat) that would be impacted as a result of construction of the proposed project. The following discussion of wildlife impacts focuses on the common species occurring in the study area. Impacts on special status wildlife species are discussed separately in Section 4.3.3 of this report.

General Habitat Loss, Wildlife Loss, Wildlife Movement, and Habitat Fragmentation

Construction of the proposed project would result in the loss of approximately 60 acres of native habitats that provide nesting, foraging, roosting, and denning opportunities for a wide variety of wildlife species. Removing or altering habitats on the project site would result in the loss of small mammals, reptiles, amphibians, and other animals of slow mobility that live in the proposed project's direct impact area. More mobile wildlife species now using the project site would be forced into remaining areas of open space, consequently increasing competition for available resources in those areas. This situation would result in the loss of individuals that cannot successfully compete. However, direct impacts on the project site would be considered less than significant because they would not significantly reduce wildlife populations in the region.

Construction of the proposed project would further fragment existing wildlife habitat on and adjacent to the project site. Both common and special status amphibian, reptile, and small mammal species populations on and in the vicinity of the project site would have reduced opportunities for genetic exchange. Birds and larger mammal species, which are capable of crossing larger areas of inhospitable habitat would be affected to a lesser extent. Specifically, project implementation would displace many individuals of a wide range of species that currently use the site into native and non-native habitats that would be retained in the: 1) open space within the project site; and 2) remaining areas of open space in the vicinity of the project site. In addition, appropriate habitat for some species may not be available on the project site after construction. As a result, some species may be extirpated from the project site.

The loss of habitat, loss of wildlife, wildlife displacement, and habitat fragmentation that would result from construction of the proposed project would not be considered significant because these impacts would not substantially diminish habitat for wildlife in the region nor reduce any specific wildlife populations in the region to below self-sustaining numbers.

The development of the project site would not impact wildlife corridors, by definition, but may affect local travel routes. Construction of the residential areas and realignment of Highway 38 would result in reduced connectivity between Big Bear Lake as a water source to the contiguous open spaces on and to the north of the project site. Additionally, construction of the proposed project would result in increased traffic on the project site by residents which would further impede movement of terrestrial wildlife currently crossing the site and Highway 38. Although this impact is considered locally

adverse, it is not considered significant because the impact does not substantially affect a regionally important wildlife movement corridor.

4.3.3 Special Status Biological Resources Impacts

Vegetation Types

Pebble Plains

A total of 0.69 acre of pebble plain habitat would be impacted by project implementation. Approximately 379 acres of pebble plain are known to exist in the San Bernardino Mountains, 60 percent (227 acres) of which occurs on public lands. Development of the project site would remove 0.18 percent of the remaining acreage of pebble plain known to occur on both public and private lands. Impacts on this vegetation type would be considered less than significant given the small area impacted by the proposed project relative to the amount of this vegetation type within the San Bernardino Mountains. Nevertheless, these impacts would be mitigated by Mitigation Measure 6.

Montane Meadows

Botanical surveys during 2002 were limited on the project site and throughout southern California due to a very low rainfall year. Many plant species indicative of the montane meadow vegetation type are either annual (i.e., complete their life cycles in a single year and then die) or perennial herbs (i.e., die back to the ground level each year and persist as underground bulbs or rootcrowns). In poor rainfall years, annual and perennial herbs may not be visible, though they may exist on a site as an inactive seed, bulb, or rootcrown. Therefore, the extent of montane meadow on the project site could not be determined during the 2002 botanical survey. However, implementation of Mitigation Measure 1 (MM-1) would reduce impacts to this vegetation type to a level considered less than significant.

Plants

Project implementation would result in impacts on four special status plant species known to occur on the project site, including one federally-listed Threatened and CNPS List 1B species, ash-gray Indian paintbrush; and three CNPS List 1B species, Parish's rock cress, Big Bear Valley woollypod, and silver-haired ivesia. Additionally, project implementation may result in impacts to special status species potentially occurring on the project site, including six Threatened or Endangered species and 20 CNPS Lists 1B and 2 species. Project implementation also has the potential to impact potentially suitable habitat for 15 CNPS List 4 species.

Special Status Plant Species Known to Occur on the Project Site

One federally-listed Threatened and CNPS List 1B species, ash-gray Indian paintbrush; and three CNPS List 1B species, Parish's rock cress, Big Bear Valley woollypod, and silver-haired ivesia, were observed on the project site during the 2002 botanical surveys conducted by BonTerra Consulting. Populations of ash-gray Indian paintbrush and Parish's rock cress were found to be widespread throughout an approximately 11.8 acre area of open Jeffrey pine forest with an herbaceous layer of Wright's matting buckwheat in the western half of the project site. The approximately 0.64 acre of pebble plain habitat was included in this area. Silver haired ivesia was found to be concentrated entirely within the mapped pebble plain habitat. Bear Valley woollypod was found in patches scattered throughout Jeffrey pine forest habitat on the project site. It is expected that population sizes for these species on the project site would be larger during a normal rainfall year (i.e., at least 40 percent of average annual precipitation).

Impacts on these species would be considered significant according to CEQA Guideline Section 15065. However, implementation of MM-1 would reduce impacts to a level considered less than significant.

Special Status Plant Species Potentially Occurring on the Project Site

Botanical surveys during 2002 were limited on the project site and throughout southern California due to a very low rainfall year. Many plant species are either annual (i.e., complete their life cycles in a single year and then die) or perennial herbs (i.e., die back to the ground level each year and persist as underground bulbs or rootcrowns). In poor rainfall years, annual and perennial herbs may not be visible, though they may exist on a site as an inactive seed, bulb, or rootcrown. Most of the special status plants of the Big Bear area are perennial herbs, making a conclusive determination of "presence" or "absence" based on field surveys difficult during low rainfall years. However, previous reports of presence and determination of habitat quality can be used to estimate the probability that a special status plant species might occur on the project site.

There is potential for several special status plants on the project site that were not detectable this spring due to dry conditions. Special status plants potentially occurring on the project site include six listed Threatened or Endangered species (bird's foot checkerbloom, San Bernardino bluegrass, California dandelion, Big Bear Valley sandwort, southern mountain buckwheat, and slender-petalled thelypodium); one CNPS List 1B and state-listed Rare species and Candidate for federal listing as Threatened or Endangered (Parish's checkerbloom); and 26 CNPS List 1B or 2 species (rock sandwort, Big Bear Valley milk vetch, Palmer's mariposa lily, San Bernardino Mountain owl's clover, male fern, San Bernardino Mountains dudleya, leafy buckwheat, San Bernardino Mountain gilia, shaggy-haired alum root, Parish's alumroot, short-sepaled lewisia, lemon lily, Baldwin Lake linanthus, San Bernardino Mountain monkeyflower, purple monkeyflower, Baja navarretia, Parish's yampah, Bear Valley phlox, Bear Valley pyrrocoma, San Bernardino butterweed, prairie wedge

grass, southern jewelflower, and grey-leaved violet). Surveys during a normal rainfall year would be required to determine presence or absence and the extent of these species on the project site.

The loss of potential habitat for these species would be considered significant according to CEQA Guideline Section 15065. However, implementation of MM-1 would reduce impacts to a level considered less than significant.

There is potential for fifteen CNPS List 4 species on the project site. The plants in the CNPS List 4 category are of limited distribution or infrequent throughout a broad area in California, and their vulnerability or susceptibility to threat appears relatively low at this time. CNPS is actively monitoring populations of the List 4 species and they will be transferred to a more appropriate list if the degree of endangerment or rarity of these species should change. The CNPS List 4 species present on the project site do not meet the definitions of Rare, Threatened, or Endangered according to CEQA Guideline Section 15065. However, they are addressed in this biological technical study given the number of species potentially present on the project site. No significant impacts to CNPS List 4 species are anticipated at present.

Wildlife

The proposed project would result in the loss of potential habitat for several special status wildlife species potentially present on the project site. For those species expected to occur, potential impacts were evaluated for the habitat which the species is expected to occupy.

Invertebrates

Project implementation may result in impacts on one special status invertebrate species, the Andrews' marble butterfly. Although not observed during general wildlife surveys, the Andrews' marble butterfly has potential to occur on the project site. Potential habitat for this species is present among plants in the pebble plain habitat on the project site. The loss of potential habitat for this species would be considered less than significant due to the limited amount of habitat loss relative to the availability of habitat for this species throughout the San Bernardino Mountains.

Amphibians

Project implementation may result in impacts on special status amphibian species. No federally- or state-listed amphibian species have potential to occur on the project site. One species that is a federal Species of Concern and state Species of Special Concern, the yellow-blotched salamander, has potential to occur on the project site. Potential habitat for this species occurs on the project site in mesic areas with rotting logs and leaf litter. The loss of potential habitat for this species would be considered less than significant due to the limited amount of habitat loss relative to the availability of habitat for this species in the region.

Reptiles

Project implementation may result in impacts on special status reptile species. One federal Species of Concern, the southern sagebrush lizard, has been observed on the project site. Four additional species that are federal Species of Concern and/or state Species of Special Concern have potential to occur on the project site. These species are the silvery legless lizard, coastal western whiptail, San Bernardino ringneck snake, and San Bernardino Mountain kingsnake. The loss of potential habitat for these species would be considered less than significant due to the limited amount of habitat loss relative to the availability of habitat for these species in the region.

Intensive surveys for the state-listed Threatened southern rubber boa were conducted on the project site in the spring and summer of 2002. Given the negative results of two independent focused survey techniques and the lack of historical records in the immediate vicinity of the project site, the survey report concluded that this species is not expected to occur on the project site. Therefore, no impacts to this species are anticipated.

Birds

Project implementation may result in impacts on special status bird species. Two federally- and/or state-listed Endangered species have potential to occur on the project site, the American peregrine falcon and bald eagle. One Fully Protected species, the white-tailed kite, has potential to occur on the project site. In addition, 16 federal Species of Concern and/or state Species of Special Concern have potential to occur on the project site and are discussed below.

Bald Eagle

The bald eagle rarely nests in southern California. However, small wintering populations of bald eagle often occur in scattered montane locations in the region. Big Bear Lake supports the largest wintering population of bald eagle and may include as many as 30 individuals in peak years. The bald eagle was observed using several trees on the project site for perch and roost locations. A records search also demonstrated that some of the most utilized perch and roost trees on the north shore of the lake are located on the project site. Given the limited distribution of wintering populations of bald eagles in southern California, removal of these trees and/or construction of uses in proximity to trees such that they would lose their perching or roosting habitat value for wintering bald eagles would be considered a significant impact. Implementation of Mitigation Measures 2 and 3 (MM-2 and MM-3) would reduce impacts to this species. However, impacts would remain significant following implementation of mitigation.

Cooper's Hawk, Northern Goshawk, Sharp-shinned Hawk, Golden Eagle, Long-eared Owl, Ferruginous Hawk, Northern Harrier, White-tailed Kite, Merlin, American Peregrine Falcon, Prairie Falcon, and California Spotted Owl

Project implementation would reduce the amount of foraging habitat for these species. This impact would contribute to the cumulative loss of foraging habitat for these raptor species. However, the loss of potential foraging habitat for these species would be considered adverse, but less than significant due to the limited amount of habitat loss relative to the availability of foraging habitat for these species in the San Bernardino Mountains and National Forest.

The Cooper's hawk, long-eared owl, white-tailed kite, and California spotted owl also have potential to nest on the project site. If an active raptor nest (common or special status species) were found on the project site, the loss of the nest would be considered a violation of the California Fish and Game Code Sections 3503, 3503.5, and 3513. The loss of any active raptor nest occurring on the project site would be considered significant. The potential impact on these species would be reduced to a level considered less than significant with the implementation of Mitigation Measure 4 (MM-4).

Black Swift, Yellow Warbler, Hepatic Tanager, Purple Martin, and Gray Vireo

Project implementation would reduce the amount of foraging habitat for these species. In addition, the hepatic tanager and purple martin have potential to nest on the project site and implementation of the project may impact active nests. The loss of potential habitat for these species would be considered adverse, but less than significant due to the limited amount of habitat loss relative to the availability of habitat for these species in the San Bernardino Mountains and National Forest. However, impacts to individual nests would result in a violation of the MBTA and would be considered a significant impact. However, implementation of Mitigation Measure 5 (MM-5) would reduce impacts to a level considered less than significant.

Mammals

Project implementation may result in impacts on special status mammal species. No federally- and/or state-listed species have potential to occur on the project site. However, 11 federal Species of Concern and/or state Species of Special Concern have potential to occur on the project site and are discussed below.

Pallid Bat, Spotted Bat, California Mastiff Bat, Small-Footed Myotis, Long-Eared Myotis, Occult Little Brown Bat, Fringed Myotis, Long-Legged Myotis, Yuma Myotis, and Pacific Western Big-Eared Bat

The proposed project provides suitable foraging habitat for these bat species. Project implementation would reduce the amount of foraging habitat for these species. The pallid bat, small-footed myotis, long-eared myotis, Occult little brown bat, fringed myotis, long-legged myotis,

and Yuma myotis, also have potential to roost on the project site. This impact would contribute to the cumulative loss of foraging and roosting habitat for these bat species. However, the loss of potential habitat for these species would be considered adverse, but less than significant, due to the limited amount of habitat loss relative to the availability of foraging and roosting habitat for these species in the San Bernardino Mountains and National Forest.

San Bernardino Mountain Flying Squirrel

The project site provides suitable foraging and breeding habitat for this species. Project implementation would impact habitat for this species. However, the loss of potential habitat would be considered adverse, but less than significant, due to the limited amount of habitat loss relative to the availability of habitat for this species in the San Bernardino Mountains and National Forest.

4.3.4 Applicable Regional and Local Policies and Plans

San Bernardino Valley Multi-Species Habitat Conservation Plan (MSHCP)

The project site is not encompassed by the MSHCP and is not subject to its policies and provisions. Therefore, no conflicts with the policies of the MSHCP are anticipated.

County of San Bernardino General Plan

The project site is located in unincorporated San Bernardino County and is subject to the provisions and policies of the County of San Bernardino General Plan. The General Plan contains a list of species considered Rare, Threatened, or Endangered by the County. Projects potentially impacting County-listed species must prepare an EIR to determine the significance of impacts on these species. Two plant species identified within the General Plan, Parish's checkerbloom and bird's foot checkerbloom, have the potential to occur on the project site. Presence or absence of these species could not be determined on the project site during the 2002 botanical surveys due to a low rainfall year. Therefore, impacts on these species were assessed according to the presence of suitable habitat. Implementation of MM-1 would determine specific population impacts and provides mitigation for these species.

County of San Bernardino Biotic Resources Overlay District

The intent of the BR Overlay District is to require the preparation of a biological technical report for projects within the BR Overlay District identifying impacts to biological resources and mitigation measures designed to reduce or eliminate project-related impacts. This biological technical report is intended to satisfy the requirements of the BR Overlay District.

Plant Protection and Management Ordinance – County of San Bernardino Municipal Code

Chapter 8, Division 9 of the San Bernardino Municipal Code contains policies and requirements applicable to the project site including Section 89.0110(a), 89.0115(c), and 89.0205.

Section 89.0110(a) dictates that perch trees within identified American bald eagle habitat shall not be removed under any circumstances. Implementation of Mitigation Measures 2 and 3 (MM-2 and MM-3) would ensure the project's compliance with this section.

Section 89.0115(c) dictates that the County "may require certification from an appropriate tree expert or native plant expert that such tree removals are appropriate, supportive of a healthy environment and are in compliance with the provisions of this chapter". The Forester's Report (Appendix F) and the Botanical Survey Letter Report (Appendix A) are intended to satisfy the requirements of this section. The County shall make a determination based on the evidence presented herein and in the Forester's Report as to the significance of the proposed project impacts to native plants and compliance with the provisions of Chapter 8, Division 9 of the Municipal Code.

The intent of Section 89.0205 is to treat coniferous tree species such that they don't present a risk of fire, and spread tree insect pests and infection. Compliance with this Section would be enforced by the County standard conditions and requirements during construction of the proposed project. Implementation of standard condition of approval 3 (SCA-3) would reduce impacts to a level considered less than significant.

Migratory Bird Treaty Act (MBTA)

Implementation of the proposed project may impact the nests of species covered by the MBTA, including the Cooper's hawk, purple martin, and hepatic tanager. However, implementation of MM-4 and MM-5 would reduce impacts to these species to a level considered less than significant.

4.4 INDIRECT IMPACTS

Indirect impacts are those related to disturbance by construction (such as noise, dust, and urban pollutants) and long-term use of the project site and its effect on the adjacent habitat areas. The indirect impact discussion below includes a general assessment of the potential indirect affects (noise, dust and urban pollutants, lighting, human activity, and non-native species introduction) of the construction and operation of the proposed project. Particular focus is placed on the indirect effects on the natural open space area on the project site collectively referred to as edge effects.

Edge effects occur where development, including roads, takes place adjacent to natural open space areas. Edge effects threaten the ecological integrity, recreational experience, aesthetic quality, public investment, and safety operations of preserved or undeveloped natural areas located adjacent to developed areas. When development is configured in a manner that creates a high ratio

of development edge to natural open space, there is an increase in the potential impacts caused by human use (indirect impacts). These indirect effects that address both the short-term construction and long-term use of the project site are outlined below.

Noise Impacts

Noise levels on the project site would increase over present levels during and upon completion of construction of the proposed project. During construction, temporary noise impacts have the potential to disrupt foraging, nesting, roosting, and denning activities for a variety of wildlife species. Upon completion of construction, noise levels on the project site would increase as a result of increased human activity associated with residential uses. Both short and long-term noise impacts could potentially disrupt the foraging and roosting potential of the site for the bald eagle. Any interruption of the foraging and/or roosting behavior of the bald eagle would be considered a significant impact.

Short-term construction noise impacts on the bald eagle could be avoided by prohibiting grading and construction activities when wintering populations are present (between November and March). However, given restrictions on construction resulting from mitigation for direct impacts (i.e., MM-4 and MM-5) construction activities would be limited strictly to the month of October. Consequently, no feasible mitigation could be determined at this time. Therefore, both short- and long-term residential noise impacts on the bald eagle would be considered an unavoidable significant impact of the proposed project.

Increased Dust and Urban Pollutants

Grading activities would disturb soils and result in the accumulation of dust on the surface of the leaves of trees, shrubs, and herbs in the natural open space areas adjacent to the project site. The respiratory function of the plants in these areas would be impaired when dust accumulation is excessive. These impacts are considered adverse, though less than significant.

Additional impacts on biological resources in the area may occur as a result of changes in water quality. Urban runoff from the proposed project containing petroleum residues and the potential for improper disposal of petroleum and chemical products from construction equipment (temporary) or infrastructure areas (e.g., vehicles, improper disposal of chemicals) (permanent) could affect water quality onsite and offsite, including Big Bear Lake potentially affecting populations of aquatic species. Water quality could also be affected by runoff of nutrients from landscape features of the proposed project. Mitigation would require that the applicant apply for coverage under the State Water Resources Control Board's General Permit for Storm Water Discharge Associated with Construction Activity and comply with all of the provisions of the permit, including the development of a Storm Water Pollution Prevention Plan (which includes provisions for the implementation of Best Management Practices and erosion control measures).

Night Lighting

Lighting of the residential units would inadvertently result in an indirect effect on the behavioral patterns of nocturnal and crepuscular (i.e., active at dawn and dusk) wildlife that are present along the boundaries of the natural areas of the project site. Of particular concern is the effect on small ground-dwelling animals that use the darkness to hide from predators, and on owls, which are specialized night foragers. In addition, the increase in night lighting could discourage nesting and roosting along the lake shore. Most notably, lighting associated with the proposed project could disrupt roosting behavior of the bald eagle on the project site. This increased lighting, in conjunction with the increased noise and habitat loss, would be considered potentially significant. Implementation of Mitigation Measures 7 and 8 (MM-7 and MM-8) would reduce this impact.

Human Activity

The increase in human activity (i.e., noise, foot traffic) would increase the disturbance of natural open space adjacent to the project site. Human disturbance could disrupt normal foraging and breeding behavior of wildlife remaining in adjacent areas, diminishing the value of these open space habitat areas. Most notably, residential activity associated with the proposed project could disrupt foraging and roosting behavior of the bald eagle on the project site. Implementation of Mitigation Measures 7, 8, and 9 (MM-7, MM-8, and MM-9) would reduce impacts.

Non-native Species Introduction

The native habitat types within the natural open space areas adjacent to the project site would be subject to greater pressure from non-native plant species within the developed portions of the project site. Areas that have undergone disturbance generally contain a high number of non-native grasses and forbs that can successfully out-compete the native plants in the region. This will be especially true after initial project grading of the project site. Should non-native plants establish themselves in these areas prior to the establishment of native plant species or non-native/non-invasive plant species in the landscape areas, the non-natives may become invasive in the natural open space areas. Left uncontrolled, these "weeds" may begin encroaching into the adjacent natural areas. These impacts could become significant if uncontrolled. Implementation of Mitigation Measure 10 (MM-10) would reduce impacts to a level considered less than significant.

5.0 MITIGATION PROGRAM

Potential impacts to Biological Resources from project implementation would be addressed through a two-category mitigation program consisting of Standard Conditions of Approval and Mitigation Measures. Conditions/Measures within each category are described below.

5.1 STANDARD CONDITIONS OF APPROVAL

This section identifies Standard Conditions of Approval (SCA) that would offset the biological impact of clearing existing vegetation types for individual lot development. The majority of the SCAs would be enforced by the County of San Bernardino during the entitlement process and are discussed to demonstrate project consistency with local and regional policies and plans applicable to the proposed project.

SCA-1 Tree replanting will be required on a 2 to 1 basis as per San Bernardino County's Plant Protection and Management Ordinance along road cuts and fills. Spacing between planted trees should be no closer than 20 feet. Low volume, fire resistant shrubs and ground cover are also recommended for planting on roadside slopes. A Professional Forester or ISA Certified Arborist with experience in the San Bernardino Mountain's should review the landscaping plan before submittal to the County.

SCA-2 The landscape plan shall include tree protection guidelines which state that all construction activities should be limited to the late summer or early fall period. Heavy equipment shall be confined to skid trails, building sites, driveway pads, and parking areas. Heavy vehicle grading over two inches, operation, service, storage, placement of fill six inches or deeper, waste disposal, and construction of concrete or asphalt pads shall not take place within the dripline of remaining trees. Utility construction and foundation footings should also remain outside the dripline (if not possible, consult a professional arborist regarding if roots should be cut, tree removed, or if other preventative measures are possible). All measures should be taken to prevent damage to roots and provide subsequent treatment if injury occurs.

SCA-3 Logs shall be removed from the site within 15 days to reduce the potential for bark beetle infestations. California Forest Practice Rules allow chipping, debarking, sealing with clear plastic for four to six months, or lopping of limbs from stems greater than three inches in diameter and scattering so that all material has maximum exposure to solar radiation. Spraying of individual pine trees with carbaryl insecticide prior to construction is considered advantageous.

5.2 MITIGATION MEASURES

This section proposes mitigation measures (MM) for those impacts of the proposed project that are considered significant or potentially significant.

5.2.1 Special Status Plants

MM-1 Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed during a year with precipitation at least 40 percent of average for the area to determine presence or absence of special status plant species and vegetation types. Surveys will

focus on listed special status vegetation types, and Threatened or Endangered, and CNPS List 1B and 2 species whose presence could not be determined during surveys due to lack of rainfall. The location and extent of special status species populations will be mapped and the size of the populations accurately documented.

The project applicant will pay compensation for the loss of special status botanical resources identified on the project site by the survey by funding the purchase and management of off-site habitat through contributions to a fund established by the California Wildlife Foundation on behalf of the CDFG. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat containing the same species as those identified within resources impacted by the proposed project will be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development).

If additional surveys during a year with precipitation at least 40 percent of average do not encounter additional special status plant resources, the project applicant is responsible for the mitigation of a minimum of 11.8-acres of pebble plain and open Jeffrey pine forest in the western half of the project site that is known to be occupied by the federally-listed Threatened ash-gray Indian paintbrush (i.e., would be required to fund the purchase of 35.4-acres of offsite habitat from the California Wildlife Foundation if the agreed mitigation ratio is 3:1).

5.2.2 Special Status Wildlife

MM-2 Trees identified on Exhibits 3 and 4 and the Bald Eagle Survey Report (Appendix E) as eagle perch locations shall be preserved in place upon project completion. Any development that may occur within the project site and in the individual lots must avoid impacts to these trees and their root structures. These restrictions on development of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow.

MM-3 Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed to identify all large trees (i.e., greater than 20-inches in diameter at four feet from the ground) within 600 feet from the high water line. Trees identified on the project site as having a diameter in excess of 20-inches at four feet from the ground within 600 feet of the shoreline shall be documented and tagged. Any development that may occur within the project site and in the individual lots must avoid impacts to tagged trees and their root structures. These restrictions on development of the individual tentative tracts must be

clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow.

MM-4 Seven days prior to the onset of construction activities, a qualified biologist will survey within the limits of project disturbance for the presence of any active raptor nests. Any nest found during survey efforts will be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys will be provided to the CDFG.

If nesting activity is present at any raptor nest site, the active site will be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for raptors in the region of the project site normally occurs from February 1 to June 30. To protect any nest site, the following restrictions on construction are required between February 1 and June 30 (or until nests are no longer active as determined by a qualified biologist): (1) clearing limits will be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying will not be allowed within 200 feet of any occupied nest. Any encroachment into the 300/200 foot buffer area around the known nest will only be allowed if it is determined by a qualified biologist that the proposed activity will not disturb the nest occupants. Construction during the nesting season can occur only at the sites if a qualified biologist has determined that fledglings have left the nest.

MM-5 Vegetation removal, clearing, and grading on the project site will be performed outside of the breeding and nesting season (between March and September) to minimize the effects of these activities on breeding activities of migratory bird and other species.

5.2.3 Special Status Vegetation Types

MM-6 The project applicant will pay compensation for the loss of pebble plain habitat identified on the site by the survey by contributing to the funding of purchase and management of off-site habitat through a fund established by the California Wildlife Foundation on behalf of the CDFG. The California Wildlife Foundation is an independent 501(c)3 nonprofit corporation founded to assist the CDFG and other governmental agencies in the management of funds and mitigation banks designed to offset the impact of development on California's native flora and fauna. Off-site habitat will be purchased at a ratio agreed upon by the County of San Bernardino, San Bernardino National Forest, USFWS, and CDFG. The typical mitigation ratio is 3:1 (i.e., three acres of habitat purchased for preservation for each acre impacted by development. An area containing no less than 2.1 acres of pebble plain habitat in an area located adjacent to other open space areas within the project vicinity will be preserved in perpetuity. The preserved areas shall be protected from future development through a conservation easement or other appropriate mechanism.

5.2.4 Wildlife Impacts/Indirect Impacts

MM-7 Street lamps on the project site shall not exceed 20 feet in height, will be fully shielded to focus light onto the street surface and will avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights will utilize low color temperature lighting (e.g., red or orange).

MM-8 Outdoor lighting for proposed homes on the individual tentative tracts shall not exceed 1,000 lumens. Furthermore, residential outdoor lighting shall not exceed 20 feet in height and must be shielded and focused downward to avoid lighting spillover onto adjacent open space or properties. These restrictions on outdoor lighting of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow.

MM-9 To limit the amount of human disturbance to adjacent natural open space areas, signs will be posted along the northeastern and eastern perimeter of the project site where the property boundary abuts open space directing people to keep out of the adjacent natural open space areas and to keep dogs leashed in areas adjacent to natural open space areas.

MM-10 Prior to the issuance of individual building permits, landscaping designs will be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review will determine that no invasive, exotic plant species are to be used in the proposed landscaping. The biologist should suggest appropriate substitutes.

6.0 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of the proposed mitigation measures would reduce impacts to biological resources to a level considered less than significant. However, impacts to the following species will remain significant following implementation of mitigation:

Bald Eagle

Implementation of the proposed project would remove trees from the project site that could provide perching and roosting habitat for the federally- and state-listed Endangered bald eagle. The bald eagle rarely nests in southern California. Big Bear Lake supports the largest wintering population of bald eagle and may include as many as 30 individuals in peak years. Bald eagles were observed using several trees on the project site for perch and roost locations. A records search also demonstrated that some of the most utilized perch and roost trees on the north shore of the lake are located on the project site. Implementation of MM-2 would preserve the trees used most often by the bald eagle on the project site. However, thinning of the tree canopy and/or construction of uses in proximity to trees such that they could lose their perching or roosting habitat value for wintering

bald eagles would remain a significant impact. Additionally, although impacts to bald eagle roosting and perching habitat resulting from increased human activity and lighting on the project site would be reduced by MM-6 and MM-7, the reduced impacts would contribute to the overall decline of habitat value for this species on the project site.

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VIA FACSIMILE AND MAIL
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Subject: Biological Constraints Report for the County of San Bernardino Land Use Services Department, Moon Camp Environmental Impact Report

Dear Glenn:

BonTerra Consulting ecologists Brian Leatherman and Scott White conducted a field survey of the Moon Camp project site on December 10, 2001. The project site is located in Fawnskin, on the northern shore of Big Bear Lake, in San Bernardino County, California. The emphasis of the field survey was to evaluate the habitat suitability for special status plant and wildlife species and determine the need for further focused biological surveys. During the field survey, weather was partly cloudy and cold (31˚F) with light to moderate wind. This letter report briefly describes the vegetation and habitat found on the property, and offers recommendations for further surveys to meet the documentation requirements of the California Environmental Quality Act (CEQA). The discussion presented in this letter report is limited to listed Threatened or Endangered plant and wildlife species and a few others of special local concern (California spotted owl [*Strix occidentalis occidentalis*], San Bernardino Mountains flying squirrel [*Glaucomys sabrinus californicus*], and white-eared pocket mouse [*Perognathus alticola alticola*]). Many other special status plant and wildlife species are known from the region, and some of these may occur on the site. These species would be addressed in more detail in the Biological Resource section of the Environmental Impact Report (EIR) for the proposed project. Appendix A contains a list of all special status plant and wildlife species within the of the region.

Vegetation and Habitat

Most of the site is open Jeffrey pine (*Pinus jeffreyi*) forest with scattered western juniper (*Juniperus occidentalis*) and California black oak (*Quercus kelloggii*) in the overstory. The tree canopy is especially open in the western half of the site. In the eastern half, especially around a mapped ephemeral stream, overstory canopy is higher. Beneath the trees, there is an open shrub layer consisting of Great Basin sagebrush (*Artemisia tridentata*), curlleaf mountain mahogany (*Cercocarpus ledifolius*), birchleaf mountain mahogany (*C. betuloides*), cupleaf ceanothus (*Ceanothus greggii*) and a few other species. The herbaceous layer includes a variety of grasses and other species, most of which could not be identified this time of year. Standing dead trees, fallen trees, and leaf litter are fairly common, especially in the eastern half of the site.

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Patches of meadow and riparian habitat occur along the southern margin of the site, between Highway 38 and the lake shore. Most plants could not be identified, but dominant herbaceous species present include sedges (*Carex* spp.), rushes (*Juncus* spp.) and grasses (genera unknown). Shrubby willow trees (*Salix* sp.) occur in scattered patches.

Special Status Wildlife

In general, habitat on the site is marginally suitable for several special status wildlife species of the San Bernardino Mountains. The discussion below is limited to listed Threatened or Endangered wildlife species and a few others of special local concern.

California Spotted Owl

The California spotted owl generally does not nest in open forest habitat, but is likely to forage on the project site. The nest of a dusky-footed woodrat (*Neotoma fuscipes*), which is the owl's primary prey, was observed on the site. The California spotted owl has a low potential to nest on the site due to the lack of dense conifer, oak, or riparian forest onsite.

Southern Rubber Boa

Southern rubber boa (*Charina bottae umbratica*), a state-listed Threatened snake, generally occurs in mesic forest habitat with rocky outcrops where it hibernates. This species is extremely secretive and lives underground for much of the time and can be very difficult to detect. The southern rubber boa has a low probability of occurring on the site.

San Bernardino Mountains Flying Squirrel

San Bernardino Mountains flying squirrel generally occurs where black oak and white fir (*Abies concolor*) are more common that currently present on the project site. This species is not expected to nest on the site but likely forages in the area.

White-eared Pocket Mouse

The white-eared pocket mouse historically occurred in the San Bernardino Mountains but has not been recorded in this area in decades. It apparently occurred in pine forest with bracken fern understory, and thus would not be expected on the project site.

Mountain Yellow-legged Frog

The U.S. Geologic Service-designated blue line stream near the eastern border of the project site does not provide suitable habitat for the mountain yellow-legged frog (*Rana muscosa*), a species proposed for federal listing as Endangered. This species is not expected due to the lack of suitable habitat.

Bald Eagle

Bald eagles (*Haliaeetus leucocephalus*) overwinter at Big Bear Lake. They are commonly observed during winter roosting in trees in the immediate vicinity of the project site, and probably on the site itself, which offers a wide view of the lake surface. Hunting eagles use perches in trees on the lake shore to watch for prey (fish, waterfowl) on the lake. Although this species is not expected to nest onsite, it is expected to occur onsite during winter to forage on the adjacent lake.

Southwestern Willow Flycatcher

Patches of willow trees along the lake shore could support breeding southwestern willow flycatchers, a state and federally listed Endangered migratory bird.

Special Status Plants

Open areas in the western portion of the project site match published descriptions of "pebble plains" (Derby & Wilson 1978; 1979), a unique habitat type supporting several listed Threatened or Endangered plant species. One Threatened species, ash-gray Indian paintbrush (*Castilleja cinera*), has been recorded on the site (MBA 2000). The site survey confirmed the occurrence of ash-gray Indian paintbrush and noted other low growing plants which could not be identified this time of year. One species on the site is a matting buckwheat, either Wright's buckwheat (*Eriogonum wrightii* ssp. *subscaposum*, a common species) or southern mountain buckwheat (*E. kennedyi* var. *austromontanum,* federally listed as Threatened). One other listed pebble plains endemic plant which could occur, but could not be documented during winter, is Bear Valley Sandwort (*Arenaria ursina*). In addition, several other special status plants not listed as Threatened or Endangered could likely occur in this habitat. These species are listed in Appendix A.

Patches of meadow and riparian habitat occur along the southern margin of the site, between Highway 38 and the lake shore. There are four federally listed plants endemic to meadows in the Big Bear Valley; these include San Bernardino bluegrass (*Poa atropurpurea*), bird's foot checkerbloom (*Sidalcea pedata*), California dandelion (*Taraxacum californicum*), and slender-petaled thelypodium (*Thelypodium stenopetalum*). These species all have a potential to occur on the project site.

Recommendations

Adverse impacts to any of the listed Threatened or Endangered species mentioned above, or to some other species not listed (California spotted owl, white-eared pocket mouse) may meet CEQA significance criteria. To evaluate the proposed project's impacts in terms of CEQA, it will be necessary to determine, to the extent possible, the presence or absence of each of the above species. Focused biological surveys that are recommended or those surveys that are not warranted for each of the species discussed above are outlined below.

California Spotted Owl

The California spotted owl has a low potential to nest on the site. Therefore focused surveys following U.S. Fish and Wildlife Service (USFWS) protocol are recommended. The site should be visited at night six times during the breeding season. (Note that the California spotted owl is not on state or federal Endangered species lists but has been petitioned for listing and its local population is in steep decline [Noon & McKelvey 1992; LaHaye et al. 1994]).

Southern Rubber Boa

The western half of the site is not suitable habitat for the southern rubber boa due to open, dry conditions with little leaf litter or other cover material. The eastern half is marginally suitable, with moderate leaf cover and numerous down logs. No rock outcrops (normally used for hibernation) occur on the site. The site is mapped as potential habitat by the California Department of Fish and Game (CDFG). The CDFG has developed a draft survey protocol that recommends three years of intensive surveys, but has not yet released the protocol. In the absence of any formal protocol, it is recommended that a survey for the rubber boa be conducted using three pitfall trap arrays, all in the eastern half of the property. Please note that failure to detect the southern rubber boa will

not enable us to reach a conclusion of "absent" because of this species secretive nature. However, a focused trapping effort will at least provide basis for a conclusion that they are unlikely to occur.

San Bernardino Mountains Flying Squirrel

Flying squirrels are uncommon and difficult to find. The site does not support their favored forest tree species in high densities and is likely only marginal habitat. Flying squirrels are almost never seen except when deliberately trapped (e.g., William La Haye, in 15 years of nocturnal spotted owl surveys, has seen only one flying squirrel). There is no formal survey protocol, but presence or absence determinations would necessitate nocturnal live-trapping surveys carried out over several nights, using fruit and/or fungi as trap bait. BonTerra does not recommend focused trapping surveys because (1) the species is not listed Threatened or Endangered and does not appear to meet this criteria under CEQA guidelines and (2) no recognized survey methodology exists, so failure to find flying squirrels may not support a determination of "absent". We recognize that San Bernardino County may request focused surveys of some type, and will design a methodology to comply if requested.

White-eared Pocket Mouse

This pocket mouse has been considered extinct locally, but little effort has been made to substantiate this presumption. Impacts, if they occur, would probably meet CEQA significance criteria. The site does not support their favored forest understory composition (bracken fern) and is likely not suitable habitat. As described above for San Bernardino Mountains flying squirrel, there is no formal survey protocol. Surveys would likely require warm-season nocturnal live-trapping surveys carried out over several nights, using grain, peanut butter, or oats as trap bait. We do not recommend focused trapping surveys for the same reasons described above for San Bernardino Mountains flying squirrel.

Mountain Yellow-legged Frog

This species is not expected on the project site due to the lack of suitable habitat. Therefore, no focused surveys are recommended for this species.

Bald Eagle

BonTerra does not recommend surveys, since bald eagle use of perch trees in the area has already been well documented. BonTerra recommends, instead, designing a mitigation plan to minimize loss of suitable perch trees within view of the lake (especially along the lake border) and minimize noise and other human-related disturbance in the areas of suitable perch trees.

Southwestern Willow Flycatcher

Following USFWS protocol, patches of willow scrub habitat along the lake shore should be visited five times during breeding season to determine presence or absence.

Special Status Plants

The site should be thoroughly surveyed by a qualified botanist familiar with the local flora at least three times during the spring and summer, scheduled to coincide with the flowering seasons of listed species potentially occurring in the area. BonTerra recommends scheduling the field visits as follows: (1) early spring (late April or early May) to survey for San Bernardino bluegrass (it may flower through August, but is best searched for early because two very similar and abundant species, *P. pratensis* and *P. palustris* begin flowering in June); (2) late spring, to coincide with the

height of flowering season for the area; and (3) mid-summer (late July or later), to coincide with flowering season of southern mountain buckwheat.

Thank you for the opportunity to work on this project. If you have any questions about this report, please feel free to call me at (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Associate Principal, Biological Services

Attachments: Appendix A

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APPENDIX A

Table 1. Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Abronia nana* ssp. *covillei **Coville's dwarf abronia**	Carbonate and sandy soils within pinon-juniper woodlands; San Bernardino Mts. and mountains of E Mojave, ±5200-9200 ft.	May - August	Fed: none Calif: S3.2 CNPS: List 4 R-E-D:1-2-1	**Low** (marginally suitable habitat)
Allium parishii **Parish's onion**	Open shrublands & woodlands, gen. loose soil of bajada or mountain slopes, often carbonate soils, about 3000 - 6000 ft. elev.	Apr - May	Fed: none Calif: S3.3? CNPS: List 4 R-E-D:1-1-2	**Low** (suitable habitat, but above known elev. range)
Antennaria marginata **White-margined everlasting**	Dry places in conifer forests, above about 4500 ft. elev.; Arizona to Colorado, Texas, and Sonora, disjunct to San Bernardino Mts (Barton Flats area)	May - August	Fed: none Calif: S1.3 CNPS: List 2 R-E-D:3-1-1	**Low** (margin of geogr. range, distant from only known S.B. Mts. locn.)
Arabis breweri* var. *pecuniaria **San Bernardino rock-cress**	Only two known occurrences, on rocky ledges in San Gorgonio Wilderness above about 9000 ft. elev.	Mar - Aug	Fed: none Calif: S1.2 CNPS: List 1B R-E-D:3-2-3	**Absent** (well below elev. range)
Arabis dispar **Pinyon rock-cress**	Granitic gravelly soils, Joshua tree woodland, pinyon-juniper woodland, desert shrubland; about 3900 - 8000 ft. elev.; Mojave Desert & adjacent Mts.	March - June	Fed: none Calif: S2.3 CNPS: List 2 R-E-D:2-1-1	**Low** (poorly suitable habitat)
Arabis parishii **Parish's rock cress**	Pebble plains; open dry sites in coniferous forest; about 6300-9500 ft. elev.; San Bernardino Mts. endemic	April - May	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Arabis shockleyi **Shockley's rock-cress**	Carbonate or quartzite soil, pinyon-juniper woodland; about 3000 to 7000 ft. elev.; N slope of San Bernardino Mts and disjunct to Inyo Co., Nevada, Utah	May - June	Fed: none Calif: S 2.2 CNPS: List 2 R-E-D:3-2-1	**Low** (poorly suitable habitat)
***Arenaria lanuginosa* ssp. *saxosa* (*A. confusa*)** **Rock sandwort**	Streamsides, sandy soils in meadows, about 5900 to 9000 ft. elev.; San Bernardino Mts. and mts. of N Baja Calif.	July - Aug	Fed: none Calif: S1.3 CNPS: 2 R-E-D:3-1-1	**Moderate** (moderately suitable habitat)
Arenaria ursina **Bear Valley sandwort**	Pebble plains, carbonate soils, about 6400 - 6900 ft. elev.; San Bernardino Mts. endemic	June - July	Fed: **THR** Calif: S2.1 CNPS: 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Astragalus albens **Cushenbury milk vetch**	Carbonate outcrops and alluvial / colluvial deposits to about 6000 ft. elev.; San Bernardino Mts endemic	March - May	**Fed: END** Calif: S1.1 CNPS: List 1B R-E-D:3-3-3	**Absent** (no suitable habitat)

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Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Astragalus bicristatus **Crested milk vetch**	Rocky slopes, montane coniferous forests; 5500-8200 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mts	May - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Astragalus lentiginosus **var. *sierrae*** **Big Bear Valley milk vetch**	Rocky meadows, pine woodlands, 5800-8500 ft. elev.; San Bernardino Mts. endemic	April - August	Fed: none Calif: S1? CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Astragalus leucolobus **Bear Valley woollypod**	Rocky soils, pine forests and sagebrush scrub, 5600-8000 ft. elev.; San Bernardino, San Gabriel, San Jacinto, and Sta Rosa Mts.	May - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Occurs?** (tentative identification during winter)
Atriplex parishii **Parish's smallscale**	Alkali sink, saltbush scrub; Central Valley, Palm Springs, Big Bear Valley; presumed extinct until recent rediscovery in San Jacinto Valley	June - October	Fed: none Calif: S1.1 CNPS: List 1B R-E-D:3-3-2	**Absent** (no suitable habitat)
Berberis fremontii **Fremont's barberry**	Rocky areas; Joshua tree, pinyon and juniper woodl, about 3000-6000 ft.; Mojave Des (CA, AZ, UT, NM) and Peninsular Ranges; historic record on Big Bear City quad now presumed extinct	April - June	Fed: none Calif: S2? CNPS: List 3 R-E-D:?-?-1	**Absent** (no suitable habitat, above elev. range)
Botrychium crenulatum **Scalloped moonwort**	Freshwater meadows, marshes, bogs, 4800-8100 ft. elev.; high mts. throughout Calif., to Washington and Utah	June - July	Fed: none Calif:S2.2 CNPS: List 2 R-E-D:2-2-1	**Absent** (no suitable habitat)
Calochortus palmeri **var. *palmeri*** **Palmer's mariposa lily**	Meadows and other sites where water available in spring, ±3900-7200 ft. elev.; S Coast Ranges, Transverse Ranges	May - June	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-3	**Moderate** (marginally suitable habitat)
Calochortus plummerae **Plummer's mariposa lily**	Chaparral, alluvial fans, pine forest, below ±5500 ft. elev.; widespread but uncommon throughout S. Calif. mtns., foothills & valleys	May - July	Fed: none Calif: S3.2 CNPS: List 1B R-E-D:2-2-3	**Absent** (above elev. range)
Castilleja cinerea **Ash-gray Indian paintbrush**	Pebble plains, dry meadows, about 5900 to 9100 ft. elev.; San Bernardino Mountains endemic	May - August	Fed: **THR** Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Occurs** (see text)
Castilleja lasiorhyncha **(syn. *Orthocarpus l.*)** **San Bernardino Mountain owl's clover**	Meadows, streamsides, seeps, other mesic sites, ±4200-7500 ft. elev.; S Calif. mtns.	June - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)

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Dryopteris filix-mas **Male fern**	Widespread in N hemisphere, esp. at high latitudes; only two widely separated locations in Calif., incl. one in Holcomb Valley	July - Sept.	Fed: none Calif: S1.3 CNPS: List 2 R-E-D:3-1-1	**Low** (local rarity)
Dudleya abramsii **ssp.** ***affinis*** **San Bernardino Mts. dudleya**	Pebble plains & rocky outcrops (often on carbonate); pinyon woodland, open pine forests, 5800-8500 ft. elev.; San Bernardino Mts. endemic	April - June	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Moderate** (marginal habitat)
Erigeron breweri **var.** ***jacinteus*** **San Jacinto Mts. daisy**	Open rocky places on mountain slopes and ridgetops, above about 8800 ft. elev.; San Jacinto, San Bernardino, and San Gabriel Mts	June - Sept.	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Absent** (below elev. range)
Erigeron parishii **Parish's daisy**	Carbonate soils to 6400 feet elev., San Bernardino Mountains endemic	May - June	**Fed: THR** Calif: 2.1 CNPS: 1B R-E-D:2-3-3	**Absent** (no suitable habitat)
Erigeron unicaulis **Limestone daisy**	Limestone soils of desert mountain ranges; eastern Calif. to Nevada; above about 6800 ft. elev. Local report probably erroneous (misidentified *E. aphanactis*?)	June - July	Fed: none Calif: S1 CNPS: List 2 R-E-D:3-2-1	**Absent** (no suitable habitat, outside geogr. range)
Eriogonum foliosum **Leafy buckwheat**	Sand; chaparral, lower montane coniferous forest, pinyon wdld., 3900-7200 ft. elev.; scattered locations, Big Bear Valley to N Baja Calif.	July - Oct.	Fed: none Calif: SH CNPS: 1B R-E-D:3-2-2	**High** (suitable habitat occurs)
Eriogonum kennedyi **var.** ***alpigenum*** **Southern alpine buckwheat**	Granitic slopes and mountaintops above about 8750 ft. elev.; Peaks of San Gabriel, San Bernardino Mts., and Mt. Pinos, also pebble plains around Big Pine Flat	July - August	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	**Absent** (below elev. range)
Eriogonum kennedyi **var.** ***austromontanum*** **Southern mountain buckwheat**	Pebble plains and similar soils, about 6200 - 6900 ft. elev.; nearly endemic to Big Bear Valley area but also occurs at Mt. Pinos	July - August	Fed: **THR** Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Absent** (field survey)
Eriogonum ovalifolium **var.** ***vineum*** **Cushenbury buckwheat**	Carbonate soils, outcrops, and talus; about 3900 to 7000 ft. elev.; San Bernardino Mountains endemic	May - June	Fed: **END** Calif: 1.1 CNPS: List 1B R-E-D:3-3-3	**Absent** (no suitable habitat)

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Eriophyllum lanatum* var. *obovatum **Southern Sierra woolly sunflower**	Open montane coniferous forests, 4200-8100 ft. elev.; S Sierra Nevada and western San Bernardino Mts.	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Low** (margin of geogr. range)
Fimbristylis thermalis **Hot springs fimbristylis**	Alkaline meadows near hot springs; San Bernardino Mts., Sierra Nevada Mts. (Kern, Mono, Inyo Cos.), Nevada, and Arizona; wide elev. range	July - Sept.	Fed: none Calif: S2.2 CNPS: List 2 R-E-D:2-2-1	**Absent** (no suitable habitat)
Galium jepsonii **(syn. *G. angustifolium* var. *subglabrum*)** **Jepson's bedstraw**	Sandy or gravelly soils, montane coniferous forest, 6500-8100 ft. elev.; San Gabriel and San Bernardino Mts	July - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Galium johnstonii **(syn. *G. angustifolium* var. *pinetorum*)** **Johnston's bedstraw**	Dry rocky slopes, open mixed conifer forest, 5300-7500 ft. elev.; San Gabriel and San Bernardino Mts.	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Gentiana fremontii **Moss gentian**	Meadows; only Calif. occurrences in San Gorgonio Wilderness above about 7800 ft. elev.; widespread in much of interior Western N America	June - August	Fed: none Calif: S2.3 CNPS: List 2 R-E-D:3-1-1	**Absent** (well below elev. range)
Gilia leptantha* ssp. *leptantha **San Bernardino Mtn. gilia**	Sandy or gravelly soils in open pine forest; endemic to San Bernardino Mts., about 5000 to 7700 ft. elev.	June - Aug	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	**High** (suitable habitat occurs)
Helianthus nuttallii* ssp. *parishii **Los Angeles sunflower**	Freshwater marsh, coastal salt marsh (Skinner & Pavlik 1994), wet ground, 1000-1500 ft. (Munz 1974); historic sites (extirpated) in LA, San Bern. and Orange Cos.	Aug. - Oct.	Fed: C1* Calif: SH CNPS: List 1A R-E-D: n/a	**Absent** (presumed extinct; no suitable habitat, well above elev. range)
Heuchera hirsutissima **Shaggy-haired alum root**	Subalpine and upper montane forests, above about 7200 ft. elev.; endemic to San Jacinto and Santa Rosa Mts (one unconfirmed record from San Bernardino Mts.)	May - July	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:3-1-3	**Low** (poorly suitable habitat)
Heuchera parishii **Parish's alumroot**	Rocky places, montane coniferous forests and alpine boulderfields, above 4800 ft. elev.; San Bernardino Mts endemic	June - July	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	**Low** (poorly suitable habitat)
Horkelia wilderae **Barton Flats horkelia**	Pine forest and chaparral, endemic to Barton Flats area; about 7000 to 10,000 ft. elev.	May - Sept.	Fed: none Calif: S1.1 CNPS: List 1B R-E-D:3-3-3	**Low** (probably outside geogr. range)

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Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Hulsea vestita* ssp. *parryi **Parry's sunflower**	Rocky sites in conifer forests, gen. loose eroding soil and talus; San Bernardino Mts and Little San Bern. Mts; about 5500-9500 ft. elev.	April - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Low** (poorly suitable habitat)
Hulsea vestita* ssp. *pygmaea **Pygmy hulsea**	Subalpine forest, gen above about 10,000 ft. elev., San Gorgonio Wilderness	Summer	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	**Absent** (well below elev. range)
Ivesia argyrocoma **Silver-haired ivesia**	Pebble plains, dry or seasonally moist meadows and drainages; ±5000-7500 ft. elev.; San Bernardino Mts and a long-disjunct site in Baja Calif mts	June - August	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-2	**Occurs** (reported by MBA 2000)
Juncus duranii **Duran's rush**	Meadows or other wet places, montane coniferous forest, 5800-9000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mts	July - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High?** (suitable habitat occurs)
Lesquerella kingii* var. *bernardina **San Bernardino Mtns. bladderpod**	Carbonate soils above about 6800 ft. elev.; San Bernardino Mts. endemic	May - June	Fed: **END** Calif: S1.1 CNPS: List 1B R-E-D:3-3-3	**Absent** (no suitable habitat)
Lewisia brachycalyx **Short-sepaled lewisia**	Wet meadows, forest openings, 4500-7500 ft. elev.; San Bernardino Mts to Baja Calif, Utah, New Mex.	May - June	Fed: none Calif: S3.2 CNPS: List 2 R-E-D:2-2-1	**Low-Moderate** (marginal habitat)
Lilium humboldtii* ssp. *ocellatum **Ocellated Humboldt lily**	Stream banks and shaded forest or chaparral, usually N-facing slopes; below about 6000 ft. elev; S and central Calif mts	June - July	Fed: none Calif: S3.2 CNPS: List 4 R-E-D:1-2-3	**Absent** (above elev. range, marginal habitat)
Lilium parryi **Lemon lily**	Meadows and streambanks above about 4000 ft. elev.; mts. of S Calif. and SE Arizona	July - August	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-2	**Low** (marginal habitat)
Linanthus killipii **Baldwin Lake linanthus**	Pebble plains, alkaline meadows, forest openings, 5500-7800 ft. elev.; San Bernardino Mts endemic	May - July	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Malaxis monophyllos* ssp. *brachypoda **Adder's mouth**	Meadows above about 7200 ft. elev., San Gorgonio Wilderness (San Bernardino Mts.); historically known from Tahquitz Meadow but evidently extinct there; widely distributed in N America	June - August	Fed: none Calif: S1.1 CNPS: List 2 R-E-D:3-3-1	**Absent** (no suitable habitat, well below local elev. range)

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Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Mimulus exiguus **San Bernardino Mountain monkeyflower**	Meadows, seeps, drainages, 5800-7500 ft. elev.; San Bernardino Mts and high mts of Baja Calif.	June - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-2	**High** (suitable habitat occurs)
Mimulus purpureus **var. *purpureus*** **Purple monkeyflower**	Meadow edges, forests, drainages, seeps, 6100-7500 ft. elev.; San Bernardino Mts and high mts of Baja Calif.	May - July	Fed: none Calif: S2.2 CNPS: List 2 R-E-D:2-2-2	**High** (suitable habitat occurs)
Monardella macrantha **ssp. *hallii*** **Hall's monardella**	Montane forests and mixed chaparral, ±2000-6500 ft. elev.; San Bernardino, San Gabriel, and Peninsular Ranges	June - August	Fed: none Calif: S3.3 CNPS: List 1B R-E-D:2-1-3	**Absent** (poorly suitable habitat, above elev. range)
Navarretia peninsularis **Baja navarretia**	Open, seasonally wet places in coniferous forests, 4800-7500 ft. elev.; mts of central and S Calif. and N Baja Calif.	June - August	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-2	**Low** (small patches of marginal habitat)
Oxytheca caryophylloides **Chickweed oxytheca**	Sandy soils in conifer forests, 3900-8500 ft. elev.; S Sierra Nevada, Transverse Ranges, San Jacinto Mts.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Oxytheca parishii **var. *cienegensis*** **Cienega seca oxytheca**	Sandy, gen. alluvial granitic soils in open, ±arid conifer forest; perhaps also on carbonate soil in pinyon woodland; about 7000-8000 ft. elev. (lower on carbonate soils?)	June - Sept.	Fed: none Calif: S1.3 CNPS: List 1B R-E-D:3-1-3	**Low** (all known occurrences well to south and east)
Oxytheca parishii **var. *goodmaniana*** **Cushenbury oxytheca**	Carbonate soils, about 4200 to 7700 ft. elev.; San Bernardino Mts. endemic; populations fluctuate widely year to year	May - Sept.	Fed: **END** Calif: S1.1 CNPS: List 1B R-E-D:3-3-3	**Absent** (no suitable habitat)
Oxytropis oreophila **Mountain oxytrope**	Alpine and subalpine forest, summit of Mt. San Gorgonio, above ca. 11,000 ft. elev.	July - Aug	Fed: none Calif: S2.3 CNPS: List 2 R-E-D:3-1-1	**Absent** (well below elev. range)
Perideridia parishii **ssp. *parishii*** **Parish's yampah**	Meadows, moist areas in coniferous forest above about 6500 ft. elev.; San Bernardino Mountains and (disjunct) Arizona and New Mex.	June - August	Fed: none Calif: S2.2? CNPS: List 2 R-E-D:2-2-1	**High** (suitable habitat occurs)
Phacelia exilis **(syn. *P. mohavensis* var. *exilis*)** **Transverse Range phacelia**	Sandy or gravelly soils, forest openings, meadows, pebble plains, 3500-8800 ft. elev.; S Sierra Nevada and Transverse Ranges	May - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)

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Table 1. Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Phacelia mohavensis **Mojave phacelia**	Sandy or gravelly soils, woodlands, conifer forests, dry meadows and streambeds, 4500-8100 ft. elev.; San Gabriel & San Bernardino Mts	April - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Phlox dolichantha **Bear Valley phlox**	Montane coniferous forest; 6500-8800 ft. elev.; San Bernardino Mts endemic	June - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Poa atropurpurea **San Bernardino bluegrass**	Open, flat meadows, 4800-7200 ft. elev.; San Bernardino Mts and Laguna Mts (San Diego Co.)	May - June	Fed: **END** Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Poliomintha incana **Frosted mint**	Subshrub; dunes, sandy soils, rocky slopes below about 5500 ft. elev.; SW states; only CA record, Cushenbury Spr, now presumed extinct	June - July	Fed: none USFS: none Calif: SH CNPS: List 1A	**Absent** (no suitable habitat, above elev. range)
Polystichum kruckebergii **Krukeberg's sword fern**	Rocky places, montane coniferous forest, 6800-10,400 ft. elev.; Calif. mts to British Columbia, Montana, Utah (occurrence in San Bernardino Mts uncertain)	June - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-1	**Absent** (poor habitat, geogr. range)
Populus angustifolia **Narrow-leaved cottonwood**	Riparian habitat in montane coniferous forests, Sierra Nevada Mts. Local report in CNPS data base presumably in error.	Mar - April	Fed: none Calif: S2S3 CNPS: List 2 R-E-D:3-2-1	**Absent** (local reports based on misidentification)
Pyrrocoma uniflora **ssp.** ***gossypina*** (*Haplopappus uniflorus* ssp. *gossypinus*) **Bear Valley pyrrocoma**	Meadows (usually alkaline), pebble plains, about 5200 - 7600 ft. elev.; San Bernardino Mts endemic	July - August	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Rupertia rigida **(syn.** ***Psoralea rigida*****)** **Parish's rupertia**	Chaparral, forests, and woodlands, below ±8100 ft. elev.; San Bernardino Mts, Peninsular Ranges, Baja Calif.	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-2	**High** (suitable habitat occurs)
Scutellaria bolanderi **ssp.** ***austromontanum*** **Southern mountain skullcap**	Stream banks and other moist sites, a few scattered sites from Victorville through San Diego Co; 1900-6500 ft. elev.	June - August	Fed: none Calif: S2.2? CNPS: List 1B R-E-D:2-2-3	**Low** (marginal habitat, above elev. range)
Sedum niveum **Davidson's stonecrop**	Rocky ledges and crevices, upper montane coniferous forest, 7100-9800 ft. elev.; San Bernardino Mts, Santa Rosa Mts	June - July	Fed: none Calif: S3.2 CNPS: List 4 R-E-D:1-2-2	**Absent** (no suitable habitat)

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Table 1. Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Selaginella asprella **Bluish spike-moss**	Rocks, crevices, & rocky soils, dry sites in coniferous forests, 5200-8800 ft. elev.; scattered mtn. ranges of cent. & S Calif., Baja Calif.	July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-2	**Low** (marginal habitat)
Senecio bernardinus **San Bernardino butterweed**	Dry meadows (sometimes alkaline), 5800-7500 ft. elev.; San Bernardino Mts endemic	May - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Low** (marginally suitable habitat)
Senecio ionophyllus **Tehachapi ragwort**	Crevices, rocky places in dry coniferous forest, 4800-8900 ft. elev.; S Sierra Nevada, San Gabriel and San Bernardino Mts	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Low** (marginally suitable habitat)
Sidalcea hickmanii **ssp. *parishii*** **Parish's checkerbloom**	Chaparral, oak shrublands, pine forests; San Bernardino Mts and a few Santa Barbara Co sites, about 3200-8200 ft. elev.	June - August	Fed: Candidate Calif: S1.2 CNPS: List 1B R-E-D:3-2-3	**Low** (marginally suitable habitat)
Sidalcea pedata **Bird's foot checkerbloom**	Meadows (freshwater or alkaline clay), sometimes streambanks, 5200-8100 ft. elev.; San Bernardino Mts endemic	May - July	Fed: **END** Calif: **END**, 1.1 CNPS: List 1B R-E-D:3-3-3	**High** (suitable habitat occurs)
Sphenopholis obtusata **Prairie wedge grass**	Riparian woodlands, wet meadows, streambanks; a few widely scattered locations in Calif. but widespread in North America	April - July	Fed: none Calif: S2.2 CNPS: List 2 R-E-D:2-2-1	**High** (suitable habitat occurs)
Streptanthus bernardinus **Laguna Mountains jewelflower**	Chaparral, hardwood forests, coniferous forest, about 3900-8100 ft. elev.; mts. of S Calif. (San Bern. Mtn. records much farther west)	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Streptanthus campestris **Southern jewelflower**	Rocky sites, chaparral, coniferous forest, pinyon woodland, 2900-7500 ft. elev.; Transverse and Peninsular Ranges, Baja Calif.	May - July	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-2	**High** (suitable habitat occurs)
Swertia neglecta **(syn. Frasera neglecta) Pine green-gentian**	Coniferous forests and pinyon wooodland., 4500-8100 ft. elev.; S Coastal Ranges and Transverse Ranges	May - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D: 1-1-3	**High** (suitable habitat occurs)
Taraxacum californicum **California dandelion**	Wet meadows, 6300-7800 ft. elev.; San Bernardino Mts endemic	May - July	Fed: **END** Calif: S2.1 CNPS: List 1B R-E-D: 3-2-3	**High** (suitable habitat occurs)

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Table 1. Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Thelypodium stenopetalum **Slender-petaled thelypodium**	Meadows (mesic, usually alkaline clay), about 6200 - 7200 ft. elev.; San Bernardino Mts endemic; all populations in Big Bear and Holcomb Valleys	June - July	Fed: **END** Calif: **END**, 1.1 CNPS: List 1B R-E-D:3-3-3	**High** (suitable habitat occurs)
Trichostema micranthum **Small-flowered bluecurls**	Dry margins of lakes, meadows, and streams, 6500-7500 ft. elev., San Bernardino Mts and Baja Calif.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-1	**High** (suitable habitat occurs)
Viola pinetorum **ssp.** ***grisea*** **Grey-leaved violet**	Coniferous forests, about 4800-11,100 ft. elev.; S Sierra Nevada Mts and possibly San Bernardinos [Skinner & Pavlik include SB Mtns in range but Hickman (ed.) does not]	April	Fed: none Calif: S1.3 CNPS: List 1B R-E-D:3-1-3	**Low** (geographic range)

General references: CDFG 2001, CNPS 2001, Rarefind 2000, Hickman (ed.) 1993, Munz 1974, Sanders et al. 1995, Tibor 2001, US Fish and Wildlife Service 1999.

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

Special Status Invertebrates	Habitat and Distribution	Activity season	Status Designation	Occurrence Probability
Euchloe hyantis ssp. andrewsi **Andrews' marble butterfly**	Montane chaparral and woodlands, 5000'-6000' elev. in the San Bernardino Mountains	Spring and summer	Fed: FSC Calif: None	**Low** (above known elev., marginal habitat)

General References: Emmel and Emmel 1973; Garth and Tilden 1986; CDFG 2000b

Sensitive Amphibian and Reptile Species	Habitat and Distribution	Activity season	Status Designation	Occurrence Probability
Taricha torosa torosa **Coast Range newt**	Riparian habitat along permanent or intermittent streams and adj. uplands, breeds in streams	Winter Spring	Fed: None Calif: CSC	**Absent** (no habitat, above elevation)
Ensatina escholtzii klauberi **Large-blotched salamander**	Moist sites in forests, e.g. beneath fallen logs; Peninsular Ranges	Spring	Fed: FSC Calif: CSC, S2S3	**Low**
Ensatina escholtzii croceater **Yellow-blotched salamander**	Moist sites in forests, e.g. beneath fallen logs; Transverse Ranges	Spring	Fed: FSC Calif: CSC, S2S3	**Moderate**
Scaphiopus hamondii **Western spadefoot toad**	Grasslands, open chaparral and pine-oak woodlands, below 4,500 feet elevation	Spring Summer	Fed: FSC Calif: CSC, CP	**Absent** (above elevation)
Rana muscosa **Mountain yellow-legged frog**	Perennial mountain streams above about 6000 ft. elev.; Sierra Nevada Mts. and mts. of S. Calif. (where its elev. range historically was as low as 3000 ft.); extinct in much of range.	Just after snow-melt to August (diurnal)	Fed: proposed **END** Calif: CSC, S2S3	**Absent** (no suitable habitat)
Aniella pulchra pulchra **Silvery legless lizard**	Chaparral, pine-oak woodland, riparian vegetation, loose alluvium, leaf litter near drainages, below 6500 ft. elev.	Spring	Fed: FSC Calif: CSC	**Low** (above known elev.)
Phrynosoma coronatum* ssp. *blainvillei **San Diego horned lizard**	Forest, shrubland or grassland with sandy areas; W Calif. from LA Co. S through Baja Calif., below ±6000 ft. elev.	Spring - summer	Fed: FSC Calif: CSC S2S3	**Low** (above known elev.)
Cnemidophorus tigris multiscutatus **Coastal western whiptail**	Woodlands, shrublands; SW Calif. through much of Baja Calif. , below ±7500 ft. elev.	Spring - summer	Fed: SOC Calif: S2S3	**High**
Coleonyx variegatus abbotti **San Diego banded gecko**	Rock outcrops in shrublands, to 5000 ft. elev.; SW Calif. through much of N Baja Calif.	Spring - summer	Fed: SOC Calif: S2S3	**Absent** (above known elev., no suitable outcrops)
Sceloporus graciosus vandenbergianus **Southern sagebrush lizard**	Forest, shrubland above about 3000 ft. elev.; Transverse and Peninsular Ranges, S Calif and N Baja Calif	Spring-summer	Fed: FSC Calif: none	**Expected**

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

Sensitive Amphibian and Reptile Species	Habitat and Distribution	Activity season	Status Designation	Occurrence Probability
Lichanura trivirgata roseofusca **Coastal rosy boa**	Rocky, chaparral-covered hillsides; LA Co. through NW Baja Calif. Elevation to about 4,500 ft.	Spring - summer	Fed: FSC Calif: S3S4	**Absent** (well above known elevation)
Charina bottae umbricata **Southern rubber boa**	Moist montane forest and woodland; Mt. Pinos, San Bernardino and San Jacinto Mts; usually cool, moist areas w/ deep rocky crevices (no records in San Gabriel Mts, but habitat and elev. seem suitable)	Summer	Fed: FSC Calif: **THR** S2S3	**Low** (see text)
Salvadora hexalepis virgultea **Coast patch-nosed snake**	Shrublands, usually with open sand; Sta. Barb. Co. through SW Calif., to NW Baja Calif. Elevation to about 4,500 ft.	Spring - summer	Fed: FSC Calif: CSC S2S3	**Absent** (poor habitat, above elevation)
Diadophis punctatus modestus **San Bernardino ringneck snake**	Variety of habitats, cismontane to about 6500' elevation, typically under rocks and logs	Spring - summer	Fed: FSC Calif: None S2	**Low** (above known elev.)
Lampropeltis zonata parvirubra **San Bernardino Mountain kingsnake**	Forests and chaparral with rock outcrops or talus, often riparian, about 1200 - 8100 ft. elev.; San Gabriel, San Bernardino and San Jacinto Mts endemic	Spring - summer	Fed: FSC Calif: CSC S2?	**High** (uncommon)
Thamnophis hammondii hammondii **Two-striped garter snake** (formerly classified as ssp. of western aquatic garter snake, *T. couchii*)	In or near perennial fresh water and adjacent riparian habitat, usually about pools in streams; SW Calif and NW Baja Calif. to ±7000 ft. elev.	Spring - summer	Fed: None Calif: CSC S2	**Absent** (no suitable habitat)

General references: CDFG 2000, CDFG 2000b, Jennings and Hayes 1994, Stebbins 1985, Stephenson and Calcarone 1999; San Bernardino National Forest 2000, USFWS 1999, Zeiner et al. 1988.

Sensitive Bird Species	Habitat and Distribution	Local occur-rance	Status Designation	Occurrence Probability
Elanus leucereus **White-tailed kite**	Breeds in woodlands and riparian forests, forages over open terrain; Pacific Coast (Calif., N Baja, Oregon), other scattered localities worldwide	Spring - summer	Fed: None Calif: CFP	Nesting: **Low** Foraging: **Low**
Haliaeetus leucocephalus **Bald eagle**	Breed in large trees, usually near major rivers or lakes; wide but scattered distribution in N America; esp. coastal regions	Winter	FWS: **END** Calif: S3 **END**	Nesting: **Absent** Winter: **Expected**

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Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

Sensitive Bird Species	Habitat and Distribution	Local occur-rance	Status Designation	Occurrence Probability
Aquila chrysaetos **Golden eagle**	Nests in remote trees and cliffs; forages over shrublands and grasslands; breeds throughout W N America, winters to E coast	Year-around	Fed: None Calif: CSC S3 (year-around)	Nesting: **Absent** Foraging: **High (rare)**
Circus cyaneus **Northern harrier**	Breeds colonially in grasslands and wetlands; forages over open terrain; N America and Eurasia	Winter; rare in summer	Fed: None Calif: S3 (nesting)	Nesting: **Absent** Foraging: **Low**
Buteo regalis **Ferruginous hawk**	Forages over grassland and shrubland; winters in W and SW N Amer. (breeds in Great Basin and N plains)	Winter	Fed: FSC Calif: CSC S3S4 (wintering)	Nesting: **Absent** Winter: **Low**
Accipiter striatus **Sharp-shinned hawk**	Nests and hunts in forests and woodlands, also forages in open areas; throughout N America, parts of S Amer-ica; rarely nests in San Bernardino Mts.	Spring - early summer	Fed: None Calif: CSC S3 (nesting only)	Nesting: **Low** (local rarity) Winter: **Expected**
Accipiter cooperii **Cooper's hawk**	Nests and hunts in forests and woodlands occasionally forages in open areas; most of US, Central and S America	Year-around	Fed: None Calif: CSC S3 (nesting only)	Nesting: **Moderate** Foraging: **Expected**
Accipiter gentilis **Northern goshawk**	Dense coniferous forests; much of N Amer (Canada, Rocky Mtns, montane W US); rarely reported in San Jacinto, San Bernardino Mts..	Spring-Fall	Fed: FSC Calif: CSC S3 (nesting)	Nesting: **Absent** Foraging: **Low**
Falco peregrinus anatum **American peregrine falcon**	Nests on high cliffs, forages primarily over open lands, fresh and saltwater marshes	Spring-Fall	Fed: delisted Calif: **END** S3 (nesting)	Nesting: **Absent** Foraging: **Low**
Falco mexicanus **Prairie falcon**	Nests on high cliffs, forages primarily over open lands; occurs throughout arid western US and Mexico	Year-around	Fed: none Calif: CSC S3 (nesting only)	Nesting: **Absent** Foraging: **Low**
Falco columbaris **Merlin**	Uncommon wintering species in S Calif. desert and valleys (breeds in northern N America and Eurasia)	Winter	Fed: none Calif: CSC S3 (winter)	Nesting: **Absent** Winter: **High** (rare)
Strix occidentalis occidentalis **California spotted owl**	Nests and forages year-around in dense conifer, oak, or (sometimes) riparian forest; Sierra Nevada, cent & S Coast Ranges, S Calif mts.	Year-around	Fed: FSC Calif: CSC S3	Nesting: **Low** Foraging: **High**

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

Sensitive Bird Species	Habitat and Distribution	Local occur-rance	Status Designation	Occurrence Probability
Asio otus **Long-eared owl**	Breeds and roosts in riparian forests and woodlands or other dense forest; forages (at night) over open lands; increasingly rare breeding in S Calif.; occurs through N America and Eurasia	Year-around	Fed: None Calif: S3 CSC	Nesting: **Low** Foraging: **Moderate**
Cypseloides niger **Black swift**	Mountains and along coastline; nest behind waterfalls on cliffs; capture insects in flight	Summer	Fed: None Calif: CSC S2	Nesting: **Absent** Foraging: **Low**
Empidonax traillii extimus **Southwestern willow flycatcher**	Breeds in dense riparian vegetation, willows are most commonly used, but other dense riparian vegetation is occasionally used, surface water is common but not essential	Spring - summer	Fed: **END** Calif: **END** (at species level)	Nesting: **Low-moderate** Migrant: **High (rare)**
Lanius ludovicianus **Loggerhead shrike**	Woodlands, shrublands, open areas with scattered perch sites; widespread in N America	Year-around	Fed: FSC Calif: CSC S4	**Absent** (above elevation)
Vireo vicinior **Gray vireo**	Arid chaparral, oak shrubland, and pinyon-juniper woodlands; breeds in mountains of SW US, winters in W Mexico	Spring - summer	Fed: None Calif: CSC S2	**Low** (habitat marginal at best)
Eremophila alpestris actia **California horned lark**	Grasslands, meadows, alkali flats; breeds in western Calif (San Diego Co through Humboldt Co) and Baja Calif	Summer	Fed: None Calif: CSC, S3	**Absent** (above elevation)
Progne subis **Purple martin**	Secondary cavity nester, hardwood and conifer woodlands; much of N. Amer., rare in Calif. (almost all extant S. Calif. breeding sites are montane)	Summer	Fed: None Calif: CSC S3 (nesting only)	**Low** (local rarity)
Dendroica petechia **Yellow warbler**	Breeds in riparian habitat; much of N Amer. but increasingly rare in S Calif. (habitat loss, cowbird parasitism); winters Mex. to S Amer.	Spring - summer	Fed: None Calif: CSC S2 (nesting only)	**Low-moderate**
Aimophila ruficeps canescens **Southern California rufous-crowned sparrow**	Coastal sage scrub, open chaparral; S Calif. and NW Baja Calif.	Year - around	Fed: FSC Calif: CSC S2S3	**Absent** (above elevation)
Amphispiza belli belli **Bell's sage sparrow**	Coastal sage scrub, chaparral, saltbush scrub, cismontane cent. and S Calif., NW Baja Calif.	Year - around	Fed: FSC Calif: CSC S2?	**Absent** (above elevation)
Piranga flava **Hepatic tanager**	Pinyon woodland with pockets of taller white fir and Jeffrey pine, pine oak woodlands on desert slopes	Spring - summer	Fed: None Calif: CSC S2 (nesting only)	**Low** (marginal habitat)

General references: CDFG 2000, CDFG 2000b, Ehrlich et al. 1988, Garrett & Dunn 1981, Grinnell & Miller 1944,

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

National Geographic Society 1999, Remsen 1978, USFWS 1999, Zeiner et al. 1990.

Sensitive Mammals	Habitat and Distribution	Activity season	Status Designation	Occurrence Probability
Antrozous pallidus **Pallid bat**	Rock outcrops of shrublands, mostly below about 6000 ft. elev.; Calif (exc high mts), SW N Amer through interior Oregon and Washington; hibernates in winter	Warm season	Fed: None Calif: CSC S3	Roosting: **Low** Foraging: **Low**
Euderma maculatum **Spotted bat**	Desert (cool seasons) to pine forest (summer), much of SW N Amer. but very rare; roosts in deep crevices in cliffs, feeds over open water	Unknown	Fed: FSC Calif: CSC S2S3	Roosting: **Absent** Foraging: **Unknown**
Eumops perotis californicus **Greater western mastiff bat**	Lowlands (with rare exceptions); cent. and S Calif., S Ariz., NM, SW Tex., N Mexico; roost in deep rock crevices, forage over wide area	Year-around	Fed: FSC Calif: CSC S3?	Roosting: **Absent** Foraging: **Low**
Plecotus (*Corynorhinus*) ***townsendii townsendii*** **Pacific western big-eared bat**	Many habitats throughout Calif and W N Amer, scattered pop'ns in E; day roosts in caves, tunnels, mines; feed primarily on moths	Year-around	Fed: FSC Calif: CSC S2S3	Roosting: **Absent** Foraging: **Unknown**
Myotis lucifugus **Occult little brown bat**	Gen pine forests, 6000-9000 ft. elev. (also lower elev. riparian habitat); roosts in buildings, trees, rocks, etc.; feed over water or open sites; hiber-nates in winter; SE Calif through Arizona and New Mexico	warm season	FWS: FSC Calif: CSC S2S3	Roosting: **High** Foraging: **High**
Myotis yumanensis **Yuma myotis**	W North America, British Columbia to cent. Mexico; in the US, mostly the Pacific states; roost in buildings, bridges, caves, mines; feed over open water	warm season?	Fed: FSC Calif: CSC S4?	Roosting: **Low** Foraging: **Low**
Myotis volans **Long-legged myotis**	W North America, SE Alaska to Vera Cruz, E through Rocky Mtns; forests and arid woodland above about 4000 ft. inland, to sea level in Calif.; roost in buildings, crevices, and trees; forage over water and in forest openings	warm season?	Fed: FSC Calif: S4?	Roosting: **Moderate** Foraging: **Moderate**
Myotis thysanodes **Fringed myotis**	W North America, primarily 4-corners states, also Calif. and other scattered locns.; arid forests, woodlands, gen. 4000-7000 ft. elev.; roost in caves, mines, buildings, rock crevices	warm season?	Fed: FSC Calif: S4	Roosting: **Low** Foraging: **Moderate**

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

Sensitive Mammals	Habitat and Distribution	Activity season	Status Designation	Occurrence Probability
Myotis evotis **Long-eared myotis**	W North America, British Columbia to N Baja, E to Rocky Mtns; conifer forests; roosts poorly known (use trees, buildings and caves); forage in woods & over water	Year-around	Fed: FSC Calif: S4?	Roosting: **Moderate** Foraging: **High**
Myotis ciliolabrum (*M. leibii*) **Small footed myotis**	Much of W North America, wide elev. range; roost in caves, mines, buildings, rock crevices, sometimes buildings & bridges; forage over water and in open woods	Year-around	Fed: FSC Calif: S?	Roosting: **Low** Foraging: **High**
Nyctinomops femorosaccus (syn. *Tadarida f.*) **Pocketed free-tailed bat**	Deserts and arid lowlands; E Riv and San Diego Cos, through SW US, Baja Calif., mainland Mexico; Roost mainly in crevices of high cliffs	Year-around	Fed: None Calif: CSC S2S3	Roosting: **Absent** Foraging: **Unknown**
Perognathus alticola alticola **White-eared pocket mouse**	Open pine forests with bracken fern and sage brush, historically from San Bernardino Mts, locally extirpated	Year-around	Fed: FSC Calif: CSC THSH	**Low** (habitat marginal; presumed extinct locally)
Glaucomys sabrinus californicus **San Bernardino Mountain flying squirrel**	Occurs in mixed conifer forest (white fir, black oak) above ±5200 ft. elev.; SB and San Jacinto Mts (expected in San Gabriels)	Year-around (noc-turnal)	Fed: FSC Calif: CSC, S3?	Nesting: **Low** Foraging: **High**
Onychomys torridus ramona **Southern grasshopper mouse**	Open country with grass, sagebrush, or other shrubs, sandy gravelly soils	Year-around	Fed: FSC Calif: CSC, S3S4	**Absent** (no suitable habitat)
Ovis canadensis nelsoni **Nelson's bighorn sheep**	Remote cliffs and steep rocky terrain	Year-around	Fed: None Calif: S3	**Absent**
Taxidea taxus **American badger**	Mountains, deserts, interior valleys where burrowing animals are avail as prey and soil permits digging; throughout cent and W N Amer	Year-around	Fed: None USFS: sensitive Calif: S4	Expected rarely
Felis concolor **Mountain lion**	Large natural areas where prey (primarily deer) is available; throughout W N Amer	Year-around	Fed: None USFS: sensitive Calif: none	Expected rarely

General references: Barbour & Davis 1969, CDFG 2000, CDFG2000b, Hall 1981, Ingles 1965, Williams 1976, USFWS 1999.

Federal designations: (federal Endangered Species Act, US Fish and Wildlife Service):

END: **Federally listed, endangered.**

THR: **Federally listed, threatened.**

C: Candidate for listing as threatened or endangered. Sufficient data are available to support federal listing, but not listed at this time. (Prior to 1996, FWS maintained a list of "category 2 candidates," of species for which threat and/or distribution data not sufficient to support federal listing. Some agencies, but *not* FWS, continue to report these as federal "species of concern."

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

State designations: (California Endangered Species Act, California Dept. of Fish and Game)

END: **State listed, endangered.**

THR: **State listed, threatened.**

RARE: **State listed as rare** (Listed "Rare" animals have been re-designated as Threatened, but Rare plants have retained the Rare designation.)

CDF&G Natural Diversity Data Base Designations: Applied to special status plants and sensitive plant communities; where correct category is uncertain, CDF&G uses two categories or question marks.

S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.
S1.1: Very threatened
S1.2: Threatened
S1.3: No current threats known
S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimel suffixes same as above).
S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimel suffixes same as above).
S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.
S5: Demonstrably secure or ineradicable in California. No threat rank.
SH: Presumed extinct in California.

California Native Plant Society (CNPS) designations: (Note: According to CNPS (Smith and Berg 1988), plants on Lists 1B and 2 meet definitions for listing as threatened or endangered under Section 1901, Chapter 10 of the California Fish and Game Code.)

List 1A: Plants presumed extinct in California.
List lB: Plants rare and endangered in California and throughout their range.
List 2: Plants rare, threatened or endangered in California but more common elsewhere in their range.
List 3: Plants about which we need more information; a review list.
List 4: Plants of limited distribution; a watch list.

CNPS R-E-D Code:

Rarity 1: Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
2: Occurrence confined to several populations or one extended population.
3: Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.

Endangerment 1: Not endangered.
2: Endangered in a portion of its range.
3: Endangered throughout its range.

Distribution 1: More or less widespread outside California.
2: Rare outside California.
3: Endemic to California (i.e., does not occur outside California).

Definitions of occurrence probability:

Occurs: Observed on the site during surveys described here, or recorded on-site by other qualified biologists.
High: Observed in similar habitat in region by qualified biologists, or habitat on the site is a type often utilized by the species and the site is within the known range of the species.
Moderate: Reported sightings in surrounding region, or site is within the known range of the species and habitat on the site is a type occasionally used by the species.
Low: Site is within the known range of the species but habitat on the site is rarely used by the species.
Absent: A focused study failed to detect the species, or, no suitable habitat is present.
Unknown: No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

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December 17, 2001

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618

VIA E-MAIL AND MAIL

Subject: Biological Constraints Report for the County of San Bernardino Land Use Services Department, Moon Camp Environmental Impact Report

Dear Glenn:

BonTerra Consulting ecologists Brian Leatherman and Scott White conducted a field survey of the Moon Camp project site on December 10, 2001. The project site is located in Fawnskin, on the northern shore of Big Bear Lake, in San Bernardino County, California. The emphasis of the field survey was to evaluate the habitat suitability for special status plant and wildlife species and determine the need for further focused biological surveys. During the field survey, weather was partly cloudy and cold (31˚F) with light to moderate wind. This letter report briefly describes the vegetation and habitat found on the property, and offers recommendations for further surveys to meet the documentation requirements of the California Environmental Quality Act (CEQA). The discussion presented in this letter report is limited to listed Threatened or Endangered plant and wildlife species and a few others of special local concern (California spotted owl [*Strix occidentalis occidentalis*], San Bernardino Mountains flying squirrel [*Glaucomys sabrinus californicus*], and white-eared pocket mouse [*Perognathus alticola alticola*]). Many other special status plant and wildlife species are known from the region, and some of these may occur on the site. These species would be addressed in more detail in the Biological Resource section of the Environmental Impact Report (EIR) for the proposed project. Appendix A contains a list of all special status plant and wildlife species within the region.

Vegetation and Habitat

Most of the site is open Jeffrey pine (*Pinus jeffreyi*) forest with scattered western juniper (*Juniperus occidentalis*) and California black oak (*Quercus kelloggii*) in the overstory. The tree canopy is especially open in the western half of the site. In the eastern half, especially around a mapped ephemeral stream, overstory canopy is higher. Beneath the trees, there is an open shrub layer consisting of Great Basin sagebrush (*Artemisia tridentata*), curlleaf mountain mahogany (*Cercocarpus ledifolius*), birchleaf mountain mahogany (*C. betuloides*), cupleaf ceanothus (*Ceanothus greggii*) and a few other species. The herbaceous layer includes a variety of grasses and other species, most of which could not be identified this time of year. Standing dead trees, fallen trees, and leaf litter are fairly common, especially in the eastern half of the site.

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Patches of meadow and riparian habitat occur along the southern margin of the site, between Highway 38 and the lake shore. Most plants could not be identified, but dominant herbaceous species present include sedges (*Carex* spp.), rushes (*Juncus* spp.) and grasses (genera unknown). Shrubby willow trees (*Salix* sp.) occur in scattered patches.

Special Status Wildlife

In general, habitat on the site is marginally suitable for several special status wildlife species of the San Bernardino Mountains. The discussion below is limited to listed Threatened or Endangered wildlife species and a few others of special local concern.

California Spotted Owl

The California spotted owl generally does not nest in open forest habitat, but is likely to forage on the project site. The nest of a dusky-footed woodrat (*Neotoma fuscipes*), which is the owl's primary prey, was observed on the site. The California spotted owl has a low potential to nest on the site due to the lack of dense conifer, oak, or riparian forest onsite.

Southern Rubber Boa

Southern rubber boa (*Charina bottae umbratica*), a state-listed Threatened snake, generally occurs in mesic forest habitat with rocky outcrops where it hibernates. This species is extremely secretive and lives underground for much of the time and can be very difficult to detect. The southern rubber boa has a low probability of occurring on the site.

San Bernardino Mountains Flying Squirrel

San Bernardino Mountains flying squirrel generally occurs where black oak and white fir (*Abies concolor*) are more common than currently present on the project site. This species is not expected to nest on the site but likely forages in the area.

White-eared Pocket Mouse

The white-eared pocket mouse historically occurred in the San Bernardino Mountains but has not been recorded in this area in decades. It apparently occurred in pine forest with bracken fern understory, and thus would not be expected on the project site.

Mountain Yellow-legged Frog

The U.S. Geologic Service-designated blue line stream near the eastern border of the project site does not provide suitable habitat for the mountain yellow-legged frog (*Rana muscosa*), a species proposed for federal listing as Endangered. This species is not expected due to the lack of suitable habitat.

Bald Eagle

Bald eagles (*Haliaeetus leucocephalus*) overwinter at Big Bear Lake. They are commonly observed during winter roosting in trees in the immediate vicinity of the project site, and probably on the site itself, which offers a wide view of the lake surface. Hunting eagles use perches in trees on the lake shore to watch for prey (fish, waterfowl) on the lake. Although this species is not expected to nest onsite, it is expected to occur onsite during winter to forage on the adjacent lake.

Southwestern Willow Flycatcher

Patches of willow trees along the lake shore could support breeding southwestern willow flycatchers, a state and federally listed Endangered migratory bird.

Special Status Plants

Open areas in the western portion of the project site match published descriptions of "pebble plains" (Derby & Wilson 1978; 1979), a unique habitat type supporting several listed Threatened or Endangered plant species. One Threatened species, ash-gray Indian paintbrush (*Castilleja cinera*), has been recorded on the site (MBA 2000). The site survey confirmed the occurrence of ash-gray Indian paintbrush and noted other low growing plants which could not be identified this time of year. One species on the site is a matting buckwheat, either Wright's buckwheat (*Eriogonum wrightii* ssp. *subscaposum*, a common species) or southern mountain buckwheat (*E. kennedyi* var. *austromontanum,* federally listed as Threatened). One other listed pebble plains endemic plant which could occur, but could not be documented during winter, is Bear Valley Sandwort (*Arenaria ursina*). In addition, several other special status plants not listed as Threatened or Endangered could likely occur in this habitat. These species are listed in Appendix A.

Patches of meadow and riparian habitat occur along the southern margin of the site, between Highway 38 and the lake shore. There are four federally listed plants endemic to meadows in the Big Bear Valley; these include San Bernardino bluegrass (*Poa atropurpurea*), bird's foot checkerbloom (*Sidalcea pedata*), California dandelion (*Taraxacum californicum*), and slender-petaled thelypodium (*Thelypodium stenopetalum*). These species all have a potential to occur on the project site.

Recommendations

Adverse impacts to any of the listed Threatened or Endangered species mentioned above, or to some other species not listed (California spotted owl, white-eared pocket mouse) may meet CEQA significance criteria. To evaluate the proposed project's impacts in terms of CEQA, it will be necessary to determine, to the extent possible, the presence or absence of each of the above species. Focused biological surveys that are recommended or those surveys that are not warranted for each of the species discussed above are outlined below.

California Spotted Owl

The California spotted owl has a low potential to nest on the site. Because this species potentially occurs onsite, focused surveys following U.S. Fish and Wildlife Service (USFWS) protocol are recommended. The site should be visited at night six times during the breeding season. (Note that the California spotted owl is not on state or federal Endangered species lists but has been petitioned for listing and its local population is in steep decline [Noon & McKelvey 1992; LaHaye et al. 1994]).

Southern Rubber Boa

The western half of the site is not suitable habitat for the southern rubber boa due to open, dry conditions with little leaf litter or other cover material. The eastern half is marginally suitable, with moderate leaf cover and numerous down logs. No rock outcrops (normally used for hibernation) occur on the site. The site is mapped as potential habitat by the California Department of Fish and Game (CDFG). The CDFG has developed a draft survey protocol that recommends three years of intensive surveys, but has not yet released the protocol. In the absence of any formal protocol, it is recommended that a survey for the rubber boa be conducted using three pitfall trap arrays, all in the eastern half of the property. Please note that failure to detect the southern rubber boa will

not enable us to reach a conclusion of "absent" because of this species secretive nature. However, a focused trapping effort will at least provide basis for a conclusion that they are unlikely to occur.

San Bernardino Mountains Flying Squirrel

Flying squirrels are uncommon and difficult to find. The site does not support their favored forest tree species in high densities and is likely only marginal habitat. Flying squirrels are almost never seen except when deliberately trapped (e.g., William La Haye, in 15 years of nocturnal spotted owl surveys, has seen only one flying squirrel). There is no formal survey protocol, but presence or absence determinations would necessitate nocturnal live-trapping surveys carried out over several nights, using fruit and/or fungi as trap bait. BonTerra does not recommend focused trapping surveys because (1) the species is not listed Threatened or Endangered and does not appear to meet this criteria under CEQA guidelines and (2) no recognized survey methodology exists, so failure to find flying squirrels may not support a determination of "absent". We recognize that San Bernardino County may request focused surveys of some type, and will design a methodology to comply if requested.

White-eared Pocket Mouse

This pocket mouse has been considered extinct locally, but little effort has been made to substantiate this presumption. Impacts, if they occur, would probably meet CEQA significance criteria. The site does not support their favored forest understory composition (bracken fern) and is likely not suitable habitat. As described above for San Bernardino Mountains flying squirrel, there is no formal survey protocol. Surveys would likely require warm-season nocturnal live-trapping surveys carried out over several nights, using grain, peanut butter, or oats as trap bait. We do not recommend focused trapping surveys for the same reasons described above for San Bernardino Mountains flying squirrel.

Mountain Yellow-legged Frog

This species is not expected on the project site due to the lack of suitable habitat. Therefore, no focused surveys are recommended for this species.

Bald Eagle

BonTerra does not recommend surveys, since bald eagle use of perch trees in the area has already been well documented. The use of the site by bald eagles will be documented in the resources section of the EIR based on recorded occurrences of eagles onsite and in the immediate vicinity, according the Forest Service information and other sources. Mitigation measures will be identified in the EIR that minimize the loss of suitable perch trees within view of the lake.

Southwestern Willow Flycatcher

Following USFWS protocol, patches of willow scrub habitat along the lake shore should be visited five times during breeding season to determine presence or absence.

Special Status Plants

The site should be thoroughly surveyed by a qualified botanist familiar with the local flora at least three times during the spring and summer, scheduled to coincide with the flowering seasons of listed species potentially occurring in the area. BonTerra recommends scheduling the field visits as follows: (1) early spring (late April or early May) to survey for San Bernardino bluegrass (it may flower through August, but is best searched for early because two very similar and abundant species, *P. pratensis* and *P. palustris* begin flowering in June); (2) late spring, to coincide with the

height of flowering season for the area; and (3) mid-summer (late July or later), to coincide with flowering season of southern mountain buckwheat.

If the EIR proceeds prior to the completion of special status species surveys listed above, a finding of potentially significant may be made for project impacts. Mitigation for these impacts will include completion of the focused surveys, and mitigation that would be required if the species were found to be present. If surveys are completed during the public review period of the environmental document, the survey findings will be incorporated into the responses to the comments on the document.

Thank you for the opportunity to work on this project. If you have any questions about this report, please feel free to call me at (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Associate Principal, Biological Services

Attachments: Appendix A

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APPENDIX A

Table 1. Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Abronia nana ssp. *covillei* Coville's dwarf abronia	Carbonate and sandy soils within pinon-juniper woodlands; San Bernardino Mts. and mountains of E Mojave, ±5200-9200 ft.	May - August	Fed: none Calif: S3.2 CNPS: List 4 R-E-D:1-2-1	Low (marginally suitable habitat)
Allium parishii Parish's onion	Open shrublands & woodlands, gen. loose soil of bajada or mountain slopes, often carbonate soils, about 3000 - 6000 ft. elev.	Apr - May	Fed: none Calif: S3.3? CNPS: List 4 R-E-D:1-1-2	Low (suitable habitat, but above known elev. range)
Antennaria marginata White-margined everlasting	Dry places in conifer forests, above about 4500 ft. elev.; Arizona to Colorado, Texas, and Sonora, disjunct to San Bernardino Mts (Barton Flats area)	May - August	Fed: none Calif: S1.3 CNPS: List 2 R-E-D:3-1-1	Low (margin of geogr. range, distant from only known S.B. Mts. locn.)
Arabis breweri var. *pecuniaria* San Bernardino rock-cress	Only two known occurrences, on rocky ledges in San Gorgonio Wilderness above about 9000 ft. elev.	Mar - Aug	Fed: none Calif: S1.2 CNPS: List 1B R-E-D:3-2-3	Absent (well below elev. range)
Arabis dispar Pinyon rock-cress	Granitic gravelly soils, Joshua tree woodland, pinyon-juniper woodland, desert shrubland; about 3900 - 8000 ft. elev.; Mojave Desert & adjacent Mts.	March - June	Fed: none Calif: S2.3 CNPS: List 2 R-E-D:2-1-1	Low (poorly suitable habitat)
Arabis parishii Parish's rock cress	Pebble plains; open dry sites in coniferous forest; about 6300-9500 ft. elev.; San Bernardino Mts. endemic	April - May	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-3	High (suitable habitat occurs)
Arabis shockleyi Shockley's rock-cress	Carbonate or quartzite soil, pinyon-juniper woodland; about 3000 to 7000 ft. elev.; N slope of San Bernardino Mts and disjunct to Inyo Co., Nevada, Utah	May - June	Fed: none Calif: S 2.2 CNPS: List 2 R-E-D:3-2-1	Low (poorly suitable habitat)
Arenaria lanuginosa ssp. *saxosa* (*A. confusa*) Rock sandwort	Streamsides, sandy soils in meadows, about 5900 to 9000 ft. elev.; San Bernardino Mts. and mts. of N Baja Calif.	July - Aug	Fed: none Calif: S1.3 CNPS: 2 R-E-D:3-1-1	Moderate (moderately suitable habitat)
Arenaria ursina Bear Valley sandwort	Pebble plains, carbonate soils, about 6400 - 6900 ft. elev.; San Bernardino Mts. endemic	June - July	Fed: THR Calif: S2.1 CNPS: 1B R-E-D:2-2-3	High (suitable habitat occurs)
Astragalus albens Cushenbury milk vetch	Carbonate outcrops and alluvial / colluvial deposits to about 6000 ft. elev.; San Bernardino Mts endemic	March - May	Fed: END Calif: S1.1 CNPS: List 1B R-E-D:3-3-3	Absent (no suitable habitat)

APPENDIX A

Table 1. Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Astragalus bicristatus **Crested milk vetch**	Rocky slopes, montane coniferous forests; 5500-8200 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mts	May - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Astragalus lentiginosus **var. *sierrae*** **Big Bear Valley milk vetch**	Rocky meadows, pine woodlands, 5800-8500 ft. elev.; San Bernardino Mts. endemic	April - August	Fed: none Calif: S1? CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Astragalus leucolobus **Bear Valley woollypod**	Rocky soils, pine forests and sagebrush scrub, 5600-8000 ft. elev.; San Bernardino, San Gabriel, San Jacinto, and Sta Rosa Mts.	May - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Occurs?** (tentative identification during winter)
Atriplex parishii **Parish's smallscale**	Alkali sink, saltbush scrub; Central Valley, Palm Springs, Big Bear Valley; presumed extinct until recent rediscovery in San Jacinto Valley	June - October	Fed: none Calif: S1.1 CNPS: List 1B R-E-D:3-3-2	**Absent** (no suitable habitat)
Berberis fremontii **Fremont's barberry**	Rocky areas; Joshua tree, pinyon and juniper woodl, about 3000-6000 ft.; Mojave Des (CA, AZ, UT, NM) and Peninsular Ranges; historic record on Big Bear City quad now presumed extinct	April - June	Fed: none Calif: S2? CNPS: List 3 R-E-D:?-?-1	**Absent** (no suitable habitat, above elev. range)
Botrychium crenulatum **Scalloped moonwort**	Freshwater meadows, marshes, bogs, 4800-8100 ft. elev.; high mts. throughout Calif., to Washington and Utah	June - July	Fed: none Calif:S2.2 CNPS: List 2 R-E-D:2-2-1	**Absent** (no suitable habitat)
Calochortus palmeri **var. *palmeri*** **Palmer's mariposa lily**	Meadows and other sites where water available in spring, ±3900-7200 ft. elev.; S Coast Ranges, Transverse Ranges	May - June	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-3	**Moderate** (marginally suitable habitat)
Calochortus plummerae **Plummer's mariposa lily**	Chaparral, alluvial fans, pine forest, below ±5500 ft. elev.; widespread but uncommon throughout S. Calif. mtns., foothills & valleys	May - July	Fed: none Calif: S3.2 CNPS: List 1B R-E-D:2-2-3	**Absent** (above elev. range)
Castilleja cinerea **Ash-gray Indian paintbrush**	Pebble plains, dry meadows, about 5900 to 9100 ft. elev.; San Bernardino Mountains endemic	May - August	Fed: **THR** Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Occurs** (see text)
Castilleja lasiorhyncha **(syn. *Orthocarpus l.*)** **San Bernardino Mountain owl's clover**	Meadows, streamsides, seeps, other mesic sites, ±4200-7500 ft. elev.; S Calif. mtns.	June - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)

APPENDIX A

Table 1. Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Dryopteris filix-mas Male fern	Widespread in N hemisphere, esp. at high latitudes; only two widely separated locations in Calif., incl. one in Holcomb Valley	July - Sept.	Fed: none Calif: S1.3 CNPS: List 2 R-E-D:3-1-1	**Low** (local rarity)
Dudleya abramsii* ssp. *affinis San Bernardino Mts. dudleya	Pebble plains & rocky outcrops (often on carbonate); pinyon woodland, open pine forests, 5800-8500 ft. elev.; San Bernardino Mts. endemic	April - June	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Moderate** (marginal habitat)
Erigeron breweri* var. *jacinteus San Jacinto Mts. daisy	Open rocky places on mountain slopes and ridgetops, above about 8800 ft. elev.; San Jacinto, San Bernardino, and San Gabriel Mts	June - Sept.	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Absent** (below elev. range)
Erigeron parishii Parish's daisy	Carbonate soils to 6400 feet elev., San Bernardino Mountains endemic	May - June	**Fed: THR** Calif: 2.1 CNPS: 1B R-E-D:2-3-3	**Absent** (no suitable habitat)
Erigeron unicaulis Limestone daisy	Limestone soils of desert mountain ranges; eastern Calif. to Nevada; above about 6800 ft. elev. Local report probably erroneous (misidentified *E. aphanactis*?)	June - July	Fed: none Calif: S1 CNPS: List 2 R-E-D:3-2-1	**Absent** (no suitable habitat, outside geogr. range)
Eriogonum foliosum Leafy buckwheat	Sand; chaparral, lower montane coniferous forest, pinyon wdld., 3900-7200 ft. elev.; scattered locations, Big Bear Valley to N Baja Calif.	July - Oct.	Fed: none Calif: SH CNPS: 1B R-E-D:3-2-2	**High** (suitable habitat occurs)
Eriogonum kennedyi* var. *alpigenum Southern alpine buckwheat	Granitic slopes and mountaintops above about 8750 ft. elev.; Peaks of San Gabriel, San Bernardino Mts., and Mt. Pinos, also pebble plains around Big Pine Flat	July - August	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	**Absent** (below elev. range)
Eriogonum kennedyi* var. *austromontanum Southern mountain buckwheat	Pebble plains and similar soils, about 6200 - 6900 ft. elev.; nearly endemic to Big Bear Valley area but also occurs at Mt. Pinos	July - August	Fed: **THR** Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Absent** (field survey)
Eriogonum ovalifolium* var. *vineum Cushenbury buckwheat	Carbonate soils, outcrops, and talus; about 3900 to 7000 ft. elev.; San Bernardino Mountains endemic	May - June	Fed: **END** Calif: 1.1 CNPS: List 1B R-E-D:3-3-3	**Absent** (no suitable habitat)

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Table 1. Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Eriophyllum lanatum var. *obovatum* Southern Sierra woolly sunflower	Open montane coniferous forests, 4200-8100 ft. elev.; S Sierra Nevada and western San Bernardino Mts.	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Low** (margin of geogr. range)
Fimbristylis thermalis Hot springs fimbristylis	Alkaline meadows near hot springs; San Bernardino Mts., Sierra Nevada Mts. (Kern, Mono, Inyo Cos.), Nevada, and Arizona; wide elev. range	July - Sept.	Fed: none Calif: S2.2 CNPS: List 2 R-E-D:2-2-1	**Absent** (no suitable habitat)
Galium jepsonii (syn. *G. angustifolium* var. *subglabrum*) Jepson's bedstraw	Sandy or gravelly soils, montane coniferous forest, 6500-8100 ft. elev.; San Gabriel and San Bernardino Mts	July - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Galium johnstonii (syn. *G. angustifolium* var. *pinetorum*) Johnston's bedstraw	Dry rocky slopes, open mixed conifer forest, 5300-7500 ft. elev.; San Gabriel and San Bernardino Mts.	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Gentiana fremontii Moss gentian	Meadows; only Calif. occurrences in San Gorgonio Wilderness above about 7800 ft. elev.; widespread in much of interior Western N America	June - August	Fed: none Calif: S2.3 CNPS: List 2 R-E-D:3-1-1	**Absent** (well below elev. range)
Gilia leptantha ssp. *leptantha* San Bernardino Mtn. gilia	Sandy or gravelly soils in open pine forest; endemic to San Bernardino Mts., about 5000 to 7700 ft. elev.	June - Aug	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	**High** (suitable habitat occurs)
Helianthus nuttallii ssp. *parishii* Los Angeles sunflower	Freshwater marsh, coastal salt marsh (Skinner & Pavlik 1994), wet ground, 1000-1500 ft. (Munz 1974); historic sites (extirpated) in LA, San Bern. and Orange Cos.	Aug. - Oct.	Fed: C1* Calif: SH CNPS: List 1A R-E-D: n/a	**Absent** (presumed extinct; no suitable habitat, well above elev. range)
Heuchera hirsutissima Shaggy-haired alum root	Subalpine and upper montane forests, above about 7200 ft. elev.; endemic to San Jacinto and Santa Rosa Mts (one unconfirmed record from San Bernardino Mts.)	May - July	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:3-1-3	**Low** (poorly suitable habitat)
Heuchera parishii Parish's alumroot	Rocky places, montane coniferous forests and alpine boulderfields, above 4800 ft. elev.; San Bernardino Mts endemic	June - July	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	**Low** (poorly suitable habitat)
Horkelia wilderae Barton Flats horkelia	Pine forest and chaparral, endemic to Barton Flats area; about 7000 to 10,000 ft. elev.	May - Sept.	Fed: none Calif: S1.1 CNPS: List 1B R-E-D:3-3-3	**Low** (probably outside geogr. range)

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Hulsea vestita* ssp. *parryi **Parry's sunflower**	Rocky sites in conifer forests, gen. loose eroding soil and talus; San Bernardino Mts and Little San Bern. Mts; about 5500-9500 ft. elev.	April - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Low** (poorly suitable habitat)
Hulsea vestita* ssp. *pygmaea **Pygmy hulsea**	Subalpine forest, gen above about 10,000 ft. elev., San Gorgonio Wilderness	Summer	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	**Absent** (well below elev. range)
Ivesia argyrocoma **Silver-haired ivesia**	Pebble plains, dry or seasonally moist meadows and drainages; ±5000-7500 ft. elev.; San Bernardino Mts and a long-disjunct site in Baja Calif mts	June - August	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-2	**Occurs** (reported by MBA 2000)
Juncus duranii **Duran's rush**	Meadows or other wet places, montane coniferous forest, 5800-9000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mts	July - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High?** (suitable habitat occurs)
Lesquerella kingii* var. *bernardina **San Bernardino Mtns. bladderpod**	Carbonate soils above about 6800 ft. elev.; San Bernardino Mts. endemic	May - June	Fed: **END** Calif: S1.1 CNPS: List 1B R-E-D:3-3-3	**Absent** (no suitable habitat)
Lewisia brachycalyx **Short-sepaled lewisia**	Wet meadows, forest openings, 4500-7500 ft. elev.; San Bernardino Mts to Baja Calif, Utah, New Mex.	May - June	Fed: none Calif: S3.2 CNPS: List 2 R-E-D:2-2-1	**Low-Moderate** (marginal habitat)
Lilium humboldtii* ssp. *ocellatum **Ocellated Humboldt lily**	Stream banks and shaded forest or chaparral, usually N-facing slopes; below about 6000 ft. elev; S and central Calif mts	June - July	Fed: none Calif: S3.2 CNPS: List 4 R-E-D:1-2-3	**Absent** (above elev. range, marginal habitat)
Lilium parryi **Lemon lily**	Meadows and streambanks above about 4000 ft. elev.; mts. of S Calif. and SE Arizona	July - August	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-2	**Low** (marginal habitat)
Linanthus killipii **Baldwin Lake linanthus**	Pebble plains, alkaline meadows, forest openings, 5500-7800 ft. elev.; San Bernardino Mts endemic	May - July	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Malaxis monophyllos* ssp. *brachypoda **Adder's mouth**	Meadows above about 7200 ft. elev., San Gorgonio Wilderness (San Bernardino Mts.); historically known from Tahquitz Meadow but evidently extinct there; widely distributed in N America	June - August	Fed: none Calif: S1.1 CNPS: List 2 R-E-D:3-3-1	**Absent** (no suitable habitat, well below local elev. range)

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Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Mimulus exiguus San Bernardino Mountain monkeyflower	Meadows, seeps, drainages, 5800-7500 ft. elev.; San Bernardino Mts and high mts of Baja Calif.	June - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-2	**High** (suitable habitat occurs)
Mimulus purpureus var. *purpureus* Purple monkeyflower	Meadow edges, forests, drainages, seeps, 6100-7500 ft. elev.; San Bernardino Mts and high mts of Baja Calif.	May - July	Fed: none Calif: S2.2 CNPS: List 2 R-E-D:2-2-2	**High** (suitable habitat occurs)
Monardella macrantha ssp. *hallii* Hall's monardella	Montane forests and mixed chaparral, ±2000-6500 ft. elev.; San Bernardino, San Gabriel, and Peninsular Ranges	June - August	Fed: none Calif: S3.3 CNPS: List 1B R-E-D:2-1-3	**Absent** (poorly suitable habitat, above elev. range)
Navarretia peninsularis Baja navarretia	Open, seasonally wet places in coniferous forests, 4800-7500 ft. elev.; mts of central and S Calif. and N Baja Calif.	June - August	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-2	**Low** (small patches of marginal habitat)
Oxytheca caryophylloides Chickweed oxytheca	Sandy soils in conifer forests, 3900-8500 ft. elev.; S Sierra Nevada, Transverse Ranges, San Jacinto Mts.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Oxytheca parishii var. *cienegensis* Cienega seca oxytheca	Sandy, gen. alluvial granitic soils in open, ±arid conifer forest; perhaps also on carbonate soil in pinyon woodland; about 7000-8000 ft. elev. (lower on carbonate soils?)	June - Sept.	Fed: none Calif: S1.3 CNPS: List 1B R-E-D:3-1-3	**Low** (all known occurrences well to south and east)
Oxytheca parishii var. *goodmaniana* Cushenbury oxytheca	Carbonate soils, about 4200 to 7700 ft. elev.; San Bernardino Mts. endemic; populations fluctuate widely year to year	May - Sept.	Fed: **END** Calif: S1.1 CNPS: List 1B R-E-D:3-3-3	**Absent** (no suitable habitat)
Oxytropis oreophila Mountain oxytrope	Alpine and subalpine forest, summit of Mt. San Gorgonio, above ca. 11,000 ft. elev.	July - Aug	Fed: none Calif: S2.3 CNPS: List 2 R-E-D:3-1-1	**Absent** (well below elev. range)
Perideridia parishii ssp. *parishii* Parish's yampah	Meadows, moist areas in coniferous forest above about 6500 ft. elev.; San Bernardino Mountains and (disjunct) Arizona and New Mex.	June - August	Fed: none Calif: S2.2? CNPS: List 2 R-E-D:2-2-1	**High** (suitable habitat occurs)
Phacelia exilis (syn. *P. mohavensis* var. *exilis*) Transverse Range phacelia	Sandy or gravelly soils, forest openings, meadows, pebble plains, 3500-8800 ft. elev.; S Sierra Nevada and Transverse Ranges	May - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)

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Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Phacelia mohavensis **Mojave phacelia**	Sandy or gravelly soils, woodlands, conifer forests, dry meadows and streambeds, 4500-8100 ft. elev.; San Gabriel & San Bernardino Mts	April - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Phlox dolichantha **Bear Valley phlox**	Montane coniferous forest; 6500-8800 ft. elev.; San Bernardino Mts endemic	June - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Poa atropurpurea **San Bernardino bluegrass**	Open, flat meadows, 4800-7200 ft. elev.; San Bernardino Mts and Laguna Mts (San Diego Co.)	May - June	Fed: **END** Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Poliomintha incana **Frosted mint**	Subshrub; dunes, sandy soils, rocky slopes below about 5500 ft. elev.; SW states; only CA record, Cushenbury Spr, now presumed extinct	June - July	Fed: none USFS: none Calif: SH CNPS: List 1A	**Absent** (no suitable habitat, above elev. range)
Polystichum kruckebergii **Krukeberg's sword fern**	Rocky places, montane coniferous forest, 6800-10,400 ft. elev.; Calif. mts to British Columbia, Montana, Utah (occurrence in San Bernardino Mts uncertain)	June - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-1	**Absent** (poor habitat, geogr. range)
Populus angustifolia **Narrow-leaved cottonwood**	Riparian habitat in montane coniferous forests, Sierra Nevada Mts. Local report in CNPS data base presumably in error.	Mar - April	Fed: none Calif: S2S3 CNPS: List 2 R-E-D:3-2-1	**Absent** (local reports based on misidentification)
Pyrrocoma uniflora **ssp.** ***gossypina*** **(*Haplopappus uniflorus* ssp. *gossypinus*)** **Bear Valley pyrrocoma**	Meadows (usually alkaline), pebble plains, about 5200 - 7600 ft. elev.; San Bernardino Mts endemic	July - August	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Rupertia rigida **(syn.** ***Psoralea rigida*****)** **Parish's rupertia**	Chaparral, forests, and woodlands, below ±8100 ft. elev.; San Bernardino Mts, Peninsular Ranges, Baja Calif.	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-2	**High** (suitable habitat occurs)
Scutellaria bolanderi **ssp.** ***austromontanum*** **Southern mountain skullcap**	Stream banks and other moist sites, a few scattered sites from Victorville through San Diego Co; 1900-6500 ft. elev.	June - August	Fed: none Calif: S2.2? CNPS: List 1B R-E-D:2-2-3	**Low** (marginal habitat, above elev. range)
Sedum niveum **Davidson's stonecrop**	Rocky ledges and crevices, upper montane coniferous forest, 7100-9800 ft. elev.; San Bernardino Mts, Santa Rosa Mts	June - July	Fed: none Calif: S3.2 CNPS: List 4 R-E-D:1-2-2	**Absent** (no suitable habitat)

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Table 1. Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Selaginella asprella **Bluish spike-moss**	Rocks, crevices, & rocky soils, dry sites in coniferous forests, 5200-8800 ft. elev.; scattered mtn. ranges of cent. & S Calif., Baja Calif.	July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-2	**Low** (marginal habitat)
Senecio bernardinus **San Bernardino butterweed**	Dry meadows (sometimes alkaline), 5800-7500 ft. elev.; San Bernardino Mts endemic	May - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Low** (marginally suitable habitat)
Senecio ionophyllus **Tehachapi ragwort**	Crevices, rocky places in dry coniferous forest, 4800-8900 ft. elev.; S Sierra Nevada, San Gabriel and San Bernardino Mts	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Low** (marginally suitable habitat)
Sidalcea hickmanii **ssp. *parishii*** **Parish's checkerbloom**	Chaparral, oak shrublands, pine forests; San Bernardino Mts and a few Santa Barbara Co sites, about 3200-8200 ft. elev.	June - August	Fed: Candidate Calif: S1.2 CNPS: List 1B R-E-D:3-2-3	**Low** (marginally suitable habitat)
Sidalcea pedata **Bird's foot checkerbloom**	Meadows (freshwater or alkaline clay), sometimes streambanks, 5200-8100 ft. elev.; San Bernardino Mts endemic	May - July	Fed: **END** Calif: **END**, 1.1 CNPS: List 1B R-E-D:3-3-3	**High** (suitable habitat occurs)
Sphenopholis obtusata **Prairie wedge grass**	Riparian woodlands, wet meadows, streambanks; a few widely scattered locations in Calif. but widespread in North America	April - July	Fed: none Calif: S2.2 CNPS: List 2 R-E-D:2-2-1	**High** (suitable habitat occurs)
Streptanthus bernardinus **Laguna Mountains jewelflower**	Chaparral, hardwood forests, coniferous forest, about 3900-8100 ft. elev.; mts. of S Calif. (San Bern. Mtn. records much farther west)	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Streptanthus campestris **Southern jewelflower**	Rocky sites, chaparral, coniferous forest, pinyon woodland, 2900-7500 ft. elev.; Transverse and Peninsular Ranges, Baja Calif.	May - July	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-2	**High** (suitable habitat occurs)
Swertia neglecta **(syn. Frasera neglecta)** **Pine green-gentian**	Coniferous forests and pinyon wooodland., 4500-8100 ft. elev.; S Coastal Ranges and Transverse Ranges	May - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D: 1-1-3	**High** (suitable habitat occurs)
Taraxacum californicum **California dandelion**	Wet meadows, 6300-7800 ft. elev.; San Bernardino Mts endemic	May - July	Fed: **END** Calif: S2.1 CNPS: List 1B R-E-D: 3-2-3	**High** (suitable habitat occurs)

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Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Thelypodium stenopetalum **Slender-petaled thelypodium**	Meadows (mesic, usually alkaline clay), about 6200 - 7200 ft. elev.; San Bernardino Mts endemic; all populations in Big Bear and Holcomb Valleys	June - July	Fed: **END** Calif: **END**, 1.1 CNPS: List 1B R-E-D:3-3-3	**High** (suitable habitat occurs)
Trichostema micranthum **Small-flowered bluecurls**	Dry margins of lakes, meadows, and streams, 6500-7500 ft. elev., San Bernardino Mts and Baja Calif.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-1	**High** (suitable habitat occurs)
Viola pinetorum **ssp.** ***grisea*** **Grey-leaved violet**	Coniferous forests, about 4800-11,100 ft. elev.; S Sierra Nevada Mts and possibly San Bernardinos [Skinner & Pavlik include SB Mtns in range but Hickman (ed.) does not]	April	Fed: none Calif: S1.3 CNPS: List 1B R-E-D:3-1-3	**Low** (geographic range)

General references: CDFG 2001, CNPS 2001, Rarefind 2000, Hickman (ed.) 1993, Munz 1974, Sanders et al. 1995, Tibor 2001, US Fish and Wildlife Service 1999.

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

Special Status Invertebrates	Habitat and Distribution	Activity season	Status Designation	Occurrence Probability
Euchloe hyantis ssp. andrewsi Andrews' marble butterfly	Montane chaparral and woodlands, 5000'-6000' elev. in the San Bernardino Mountains	Spring and summer	Fed: FSC Calif: None	Low (above known elev., marginal habitat)

General References: Emmel and Emmel 1973; Garth and Tilden 1986; CDFG 2000b

Sensitive Amphibian and Reptile Species	Habitat and Distribution	Activity season	Status Designation	Occurrence Probability
Taricha torosa torosa Coast Range newt	Riparian habitat along permanent or intermittent streams and adj. uplands, breeds in streams	Winter Spring	Fed: None Calif: CSC	Absent (no habitat, above elevation)
Ensatina escholtzii klauberi Large-blotched salamander	Moist sites in forests, e.g. beneath fallen logs; Peninsular Ranges	Spring	Fed: FSC Calif: CSC, S2S3	Low
Ensatina escholtzii croceater Yellow-blotched salamander	Moist sites in forests, e.g. beneath fallen logs; Transverse Ranges	Spring	Fed: FSC Calif: CSC, S2S3	Moderate
Scaphiopus hamondii Western spadefoot toad	Grasslands, open chaparral and pine-oak woodlands, below 4,500 feet elevation	Spring Summer	Fed: FSC Calif: CSC, CP	Absent (above elevation)
Rana muscosa Mountain yellow-legged frog	Perennial mountain streams above about 6000 ft. elev.; Sierra Nevada Mts. and mts. of S. Calif. (where its elev. range historically was as low as 3000 ft.); extinct in much of range.	Just after snow-melt to August (diurnal)	Fed: proposed END Calif: CSC, S2S3	Absent (no suitable habitat)
Aniella pulchra pulchra Silvery legless lizard	Chaparral, pine-oak woodland, riparian vegetation, loose alluvium, leaf litter near drainages, below 6500 ft. elev.	Spring	Fed: FSC Calif: CSC	Low (above known elev.)
Phrynosoma coronatum ssp. *blainvillei* San Diego horned lizard	Forest, shrubland or grassland with sandy areas; W Calif. from LA Co. S through Baja Calif., below ±6000 ft. elev.	Spring - summer	Fed: FSC Calif: CSC S2S3	Low (above known elev.)
Cnemidophorus tigris multiscutatus Coastal western whiptail	Woodlands, shrublands; SW Calif. through much of Baja Calif. , below ±7500 ft. elev.	Spring - summer	Fed: SOC Calif: S2S3	High
Coleonyx variegatus abbotti San Diego banded gecko	Rock outcrops in shrublands, to 5000 ft. elev.; SW Calif. through much of N Baja Calif.	Spring - summer	Fed: SOC Calif: S2S3	Absent (above known elev., no suitable outcrops)
Sceloporus graciosus vandenbergianus Southern sagebrush lizard	Forest, shrubland above about 3000 ft. elev.; Transverse and Peninsular Ranges, S Calif and N Baja Calif	Spring-summer	Fed: FSC Calif: none	Expected

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

Sensitive Amphibian and Reptile Species	Habitat and Distribution	Activity season	Status Designation	Occurrence Probability
Lichanura trivirgata roseofusca Coastal rosy boa	Rocky, chaparral-covered hillsides; LA Co. through NW Baja Calif. Elevation to about 4,500 ft.	Spring - summer	Fed: FSC Calif: S3S4	**Absent** (well above known elevation)
Charina bottae umbricata. Southern rubber boa	Moist montane forest and woodland; Mt. Pinos, San Bernardino and San Jacinto Mts; usually cool, moist areas w/ deep rocky crevices (no records in San Gabriel Mts, but habitat and elev. seem suitable)	Summer	Fed: FSC Calif: **THR** S2S3	**Low** (see text)
Salvadora hexalepis virgultea Coast patch-nosed snake	Shrublands, usually with open sand; Sta. Barb. Co. through SW Calif., to NW Baja Calif. Elevation to about 4,500 ft.	Spring - summer	Fed: FSC Calif: CSC S2S3	**Absent** (poor habitat, above elevation)
Diadophis punctatus modestus San Bernardino ringneck snake	Variety of habitats, cismontane to about 6500' elevation, typically under rocks and logs	Spring - summer	Fed: FSC Calif: None S2	**Low** (above known elev.)
Lampropeltis zonata parvirubra San Bernardino Mountain kingsnake	Forests and chaparral with rock outcrops or talus, often riparian, about 1200 - 8100 ft. elev.; San Gabriel, San Bernardino and San Jacinto Mts endemic	Spring - summer	Fed: FSC Calif: CSC S2?	**High** (uncommon)
Thamnophis hammondii hammondii Two-striped garter snake (formerly classified as ssp. of western aquatic garter snake, *T. couchii*)	In or near perennial fresh water and adjacent riparian habitat, usually about pools in streams; SW Calif and NW Baja Calif. to ±7000 ft. elev.	Spring - summer	Fed: None Calif: CSC S2	**Absent** (no suitable habitat)

General references: CDFG 2000, CDFG 2000b, Jennings and Hayes 1994, Stebbins 1985, Stephenson and Calcarone 1999; San Bernardino National Forest 2000, USFWS 1999, Zeiner et al. 1988.

Sensitive Bird Species	Habitat and Distribution	Local occur-rance	Status Designation	Occurrence Probability
Elanus leucereus White-tailed kite	Breeds in woodlands and riparian forests, forages over open terrain; Pacific Coast (Calif., N Baja, Oregon), other scattered localities worldwide	Spring - summer	Fed: None Calif: CFP	Nesting: **Low** Foraging: **Low**
Haliaeetus leucocephalus Bald eagle	Breed in large trees, usually near major rivers or lakes; wide but scattered distribution in N America; esp. coastal regions	Winter	FWS: **END** Calif: S3 **END**	Nesting: **Absent** Winter: **Expected**

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

Sensitive Bird Species	Habitat and Distribution	Local occur-rance	Status Designation	Occurrence Probability
Aquila chrysaetos **Golden eagle**	Nests in remote trees and cliffs; forages over shrublands and grasslands; breeds throughout W N America, winters to E coast	Year-around	Fed: None Calif: CSC S3 (year-around)	Nesting: **Absent** Foraging: **High (rare)**
Circus cyaneus **Northern harrier**	Breeds colonially in grasslands and wetlands; forages over open terrain; N America and Eurasia	Winter; rare in summer	Fed: None Calif: S3 (nesting)	Nesting: **Absent** Foraging: **Low**
Buteo regalis **Ferruginous hawk**	Forages over grassland and shrubland; winters in W and SW N Amer. (breeds in Great Basin and N plains)	Winter	Fed: FSC Calif: CSC S3S4 (wintering)	Nesting: **Absent** Winter: **Low**
Accipiter striatus **Sharp-shinned hawk**	Nests and hunts in forests and woodlands, also forages in open areas; throughout N America, parts of S America; rarely nests in San Bernardino Mts.	Spring - early summer	Fed: None Calif: CSC S3 (nesting only)	Nesting: **Low** (local rarity) Winter: **Expected**
Accipiter cooperii **Cooper's hawk**	Nests and hunts in forests and woodlands occasionally forages in open areas; most of US, Central and S America	Year-around	Fed: None Calif: CSC S3 (nesting only)	Nesting: **Moderate** Foraging: **Expected**
Accipiter gentilis **Northern goshawk**	Dense coniferous forests; much of N Amer (Canada, Rocky Mtns, montane W US); rarely reported in San Jacinto, San Bernardino Mts..	Spring-Fall	Fed: FSC Calif: CSC S3 (nesting)	Nesting: **Absent** Foraging: **Low**
Falco peregrinus anatum **American peregrine falcon**	Nests on high cliffs, forages primarily over open lands, fresh and saltwater marshes	Spring-Fall	Fed: delisted Calif: **END** S3 (nesting)	Nesting: **Absent** Foraging: **Low**
Falco mexicanus **Prairie falcon**	Nests on high cliffs, forages primarily over open lands; occurs throughout arid western US and Mexico	Year-around	Fed: none Calif: CSC S3 (nesting only)	Nesting: **Absent** Foraging: **Low**
Falco columbaris **Merlin**	Uncommon wintering species in S Calif. desert and valleys (breeds in northern N America and Eurasia)	Winter	Fed: none Calif: CSC S3 (winter)	Nesting: **Absent** Winter: **High** (rare)
Strix occidentalis occidentalis **California spotted owl**	Nests and forages year-around in dense conifer, oak, or (sometimes) riparian forest; Sierra Nevada, cent & S Coast Ranges, S Calif mts.	Year-around	Fed: FSC Calif: CSC S3	Nesting: **Low** Foraging: **High**

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

Sensitive Bird Species	Habitat and Distribution	Local occur-rance	Status Designation	Occurrence Probability
Asio otus Long-eared owl	Breeds and roosts in riparian forests and woodlands or other dense forest; forages (at night) over open lands; increasingly rare breeding in S Calif.; occurs through N America and Eurasia	Year-around	Fed: None Calif: S3 CSC	Nesting: Low Foraging: Moderate
Cypseloides niger Black swift	Mountains and along coastline; nest behind waterfalls on cliffs; capture insects in flight	Summer	Fed: None Calif: CSC S2	Nesting: Absent Foraging: Low
Empidonax traillii extimus Southwestern willow flycatcher	Breeds in dense riparian vegetation, willows are most commonly used, but other dense riparian vegetation is occasionally used, surface water is common but not essential	Spring - summer	Fed: END Calif: END (at species level)	Nesting: Low-moderate Migrant: High (rare)
Lanius ludovicianus Loggerhead shrike	Woodlands, shrublands, open areas with scattered perch sites; widespread in N America	Year-around	Fed: FSC Calif: CSC S4	Absent (above elevation)
Vireo vicinior Gray vireo	Arid chaparral, oak shrubland, and pinyon-juniper woodlands; breeds in mountains of SW US, winters in W Mexico	Spring - summer	Fed: None Calif: CSC S2	Low (habitat marginal at best)
Eremophila alpestris actia California horned lark	Grasslands, meadows, alkali flats; breeds in western Calif (San Diego Co through Humboldt Co) and Baja Calif	Summer	Fed: None Calif: CSC, S3	Absent (above elevation)
Progne subis Purple martin	Secondary cavity nester, hardwood and conifer woodlands; much of N. Amer., rare in Calif. (almost all extant S. Calif. breeding sites are montane)	Summer	Fed: None Calif: CSC S3 (nesting only)	Low (local rarity)
Dendroica petechia Yellow warbler	Breeds in riparian habitat; much of N Amer. but increasingly rare in S Calif. (habitat loss, cowbird parasitism); winters Mex. to S Amer.	Spring - summer	Fed: None Calif: CSC S2 (nesting only)	Low-moderate
Aimophila ruficeps canescens Southern California rufous-crowned sparrow	Coastal sage scrub, open chaparral; S Calif. and NW Baja Calif.	Year - around	Fed: FSC Calif: CSC S2S3	Absent (above elevation)
Amphispiza belli belli Bell's sage sparrow	Coastal sage scrub, chaparral, saltbush scrub, cismontane cent. and S Calif., NW Baja Calif.	Year - around	Fed: FSC Calif: CSC S2?	Absent (above elevation)
Piranga flava Hepatic tanager	Pinyon woodland with pockets of taller white fir and Jeffrey pine, pine oak woodlands on desert slopes	Spring - summer	Fed: None Calif: CSC S2 (nesting only)	Low (marginal habitat)

General references: CDFG 2000, CDFG 2000b, Ehrlich et al. 1988, Garrett & Dunn 1981, Grinnell & Miller 1944,

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

National Geographic Society 1999, Remsen 1978, USFWS 1999, Zeiner et al. 1990.

Sensitive Mammals	Habitat and Distribution	Activity season	Status Designation	Occurrence Probability
Antrozous pallidus **Pallid bat**	Rock outcrops of shrublands, mostly below about 6000 ft. elev.; Calif (exc high mts), SW N Amer through interior Oregon and Washington; hibernates in winter	Warm season	Fed: None Calif: CSC S3	Roosting: **Low** Foraging: **Low**
Euderma maculatum **Spotted bat**	Desert (cool seasons) to pine forest (summer), much of SW N Amer. but very rare; roosts in deep crevices in cliffs, feeds over open water	Unknown	Fed: FSC Calif: CSC S2S3	Roosting: **Absent** Foraging: **Unknown**
Eumops perotis californicus **Greater western mastiff bat**	Lowlands (with rare exceptions); cent. and S Calif., S Ariz., NM, SW Tex., N Mexico; roost in deep rock crevices, forage over wide area	Year-around	Fed: FSC Calif: CSC S3?	Roosting: **Absent** Foraging: **Low**
Plecotus (*Corynorhinus*) *townsendii townsendii* **Pacific western big-eared bat**	Many habitats throughout Calif and W N Amer, scattered pop'ns in E; day roosts in caves, tunnels, mines; feed primarily on moths	Year-around	Fed: FSC Calif: CSC S2S3	Roosting: **Absent** Foraging: **Unknown**
Myotis lucifugus **Occult little brown bat**	Gen pine forests, 6000-9000 ft. elev. (also lower elev. riparian habitat); roosts in buildings, trees, rocks, etc.; feed over water or open sites; hiber-nates in winter; SE Calif through Arizona and New Mexico	warm season	FWS: FSC Calif: CSC S2S3	Roosting: **High** Foraging: **High**
Myotis yumanensis **Yuma myotis**	W North America, British Columbia to cent. Mexico; in the US, mostly the Pacific states; roost in buildings, bridges, caves, mines; feed over open water	warm season?	Fed: FSC Calif: CSC S4?	Roosting: **Low** Foraging: **Low**
Myotis volans **Long-legged myotis**	W North America, SE Alaska to Vera Cruz, E through Rocky Mtns; forests and arid woodland above about 4000 ft. inland, to sea level in Calif.; roost in buildings, crevices, and trees; forage over water and in forest openings	warm season?	Fed: FSC Calif: S4?	Roosting: **Moderate** Foraging: **Moderate**
Myotis thysanodes **Fringed myotis**	W North America, primarily 4-corners states, also Calif. and other scattered locns.; arid forests, woodlands, gen. 4000-7000 ft. elev.; roost in caves, mines, buildings, rock crevices	warm season?	Fed: FSC Calif: S4	Roosting: **Low** Foraging: **Moderate**

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

Sensitive Mammals	Habitat and Distribution	Activity season	Status Designation	Occurrence Probability
Myotis evotis Long-eared myotis	W North America, British Columbia to N Baja, E to Rocky Mtns; conifer forests; roosts poorly known (use trees, buildings and caves); forage in woods & over water	Year-around	Fed: FSC Calif: S4?	Roosting: **Moderate** Foraging: **High**
Myotis ciliolabrum (*M. leibii*) Small footed myotis	Much of W North America, wide elev. range; roost in caves, mines, buildings, rock crevices, sometimes buildings & bridges; forage over water and in open woods	Year-around	Fed: FSC Calif: S?	Roosting: **Low** Foraging: **High**
Nyctinomops femorosaccus (syn. *Tadarida f.*) Pocketed free-tailed bat	Deserts and arid lowlands; E Riv and San Diego Cos, through SW US, Baja Calif., mainland Mexico; Roost mainly in crevices of high cliffs	Year-around	Fed: None Calif: CSC S2S3	Roosting: **Absent** Foraging: **Unknown**
Perognathus alticola alticola White-eared pocket mouse	Open pine forests with bracken fern and sage brush, historically from San Bernardino Mts, locally extirpated	Year-around	Fed: FSC Calif: CSC THSH	**Low** (habitat marginal; presumed extinct locally)
Glaucomys sabrinus californicus San Bernardino Mountain flying squirrel	Occurs in mixed conifer forest (white fir, black oak) above ±5200 ft. elev.; SB and San Jacinto Mts (expected in San Gabriels)	Year-around (nocturnal)	Fed: FSC Calif: CSC, S3?	Nesting: **Low** Foraging: **High**
Onychomys torridus ramona Southern grasshopper mouse	Open country with grass, sagebrush, or other shrubs, sandy gravelly soils	Year-around	Fed: FSC Calif: CSC, S3S4	**Absent** (no suitable habitat)
Ovis canadensis nelsoni Nelson's bighorn sheep	Remote cliffs and steep rocky terrain	Year-around	Fed: None Calif: S3	**Absent**
Taxidea taxus American badger	Mountains, deserts, interior valleys where burrowing animals are avail as prey and soil permits digging; throughout cent and W N Amer	Year-around	Fed: None USFS: sensitive Calif: S4	Expected rarely
Felis concolor Mountain lion	Large natural areas where prey (primarily deer) is available; throughout W N Amer	Year-around	Fed: None USFS: sensitive Calif: none	Expected rarely

General references: Barbour & Davis 1969, CDFG 2000, CDFG2000b, Hall 1981, Ingles 1965, Williams 1976, USFWS 1999.

Federal designations: (federal Endangered Species Act, US Fish and Wildlife Service):

END: **Federally listed, endangered.**

THR: **Federally listed, threatened.**

C: Candidate for listing as threatened or endangered. Sufficient data are available to support federal listing, but not listed at this time. (Prior to 1996, FWS maintained a list of "category 2 candidates," of species for which threat and/or distribution data not sufficient to support federal listing. Some agencies, but *not* FWS, continue to report these as federal "species of concern."

Table 2. Special Status Animals of the Big Bear Valley and Surrounding Mountains

State designations: (California Endangered Species Act, California Dept. of Fish and Game)

END: **State listed, endangered.**
THR: **State listed, threatened.**
RARE: **State listed as rare** (Listed "Rare" animals have been re-designated as Threatened, but Rare plants have retained the Rare designation.)

CDF&G Natural Diversity Data Base Designations: Applied to special status plants and sensitive plant communities; where correct category is uncertain, CDF&G uses two categories or question marks.

S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.
S1.1: Very threatened
S1.2: Threatened
S1.3: No current threats known
S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimel suffixes same as above).
S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimel suffixes same as above).
S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.
S5: Demonstrably secure or ineradicable in California. No threat rank.
SH: Presumed extinct in California.

California Native Plant Society (CNPS) designations: (Note: According to CNPS (Smith and Berg 1988), plants on Lists 1B and 2 meet definitions for listing as threatened or endangered under Section 1901, Chapter 10 of the California Fish and Game Code.)

List 1A: Plants presumed extinct in California.
List lB: Plants rare and endangered in California and throughout their range.
List 2: Plants rare, threatened or endangered in California but more common elsewhere in their range.
List 3: Plants about which we need more information; a review list.
List 4: Plants of limited distribution; a watch list.

CNPS R-E-D Code:

Rarity l: Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
2: Occurrence confined to several populations or one extended population.
3: Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.
Endangerment 1: Not endangered.
2: Endangered in a portion of its range.
3: Endangered throughout its range.
Distribution 1: More or less widespread outside California.
2: Rare outside California.
3: Endemic to California (i.e., does not occur outside California).

Definitions of occurrence probability:

Occurs: Observed on the site during surveys described here, or recorded on-site by other qualified biologists.
High: Observed in similar habitat in region by qualified biologists, or habitat on the site is a type often utilized by the species and the site is within the known range of the species.
Moderate: Reported sightings in surrounding region, or site is within the known range of the species and habitat on the site is a type occasionally used by the species.
Low: Site is within the known range of the species but habitat on the site is rarely used by the species.
Absent: A focused study failed to detect the species, or, no suitable habitat is present.
Unknown: No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

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April 16, 2002

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
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VIA FACSIMILE AND MAIL
(949) 472-8373

Subject: Results of Bald Eagle surveys on Tentative Tract 16136, Moon Camp, Fawnskin, San Bernardino County, California

Dear Mr. Lajoie:

This letter report presents the results of bald eagle (*Haliaeetus leucocephalus*) surveys performed in February 2002 by William S. La Haye and Brian Kertson on Tentative Tract 16136 in unincorporated San Bernardino County, California (hereafter referred to as the project site). In addition, a summary of a records search of historic sightings of this species on and in the vicinity of the project site is also presented.

Project Location and Description

The project site consists of an approximately 62.5-acre parcel on the north shoreline of Big Bear Lake, San Bernardino County, California. The project site is covered by U.S. Geological Survey's Fawnskin, California Quadrangle at Township 2N, Range 1E and includes portions of Sections 7 and 12. Project regional location and vicinity maps are presented in Exhibits 1 and 2, respectively.

The southwestern portion of the project site includes shoreline of Big Bear Lake and Highway 38 parallels the lakeshore on the property for approximately 1/4 mile. Historically, the project site consisted of Moon Camp, a small cabin resort which existed from the early 1920s through 1951 when a forest fire destroyed most of the buildings. At some later date, most of the remnants of the cabins and foundations were removed from the site.

The project site includes a series of low, rolling hills between approximately 6,940 feet above mean sea level (msl) and 6,740 feet above msl. The vegetation on the site is primarily open Jeffrey pine (*Pinus jeffreyi*) forest near the lake and highway and gradually transitions into mixed-conifer forest towards the northeast portion of the property. Other common trees encountered on the site consist of white fir (*Abies concolor*) and black oak (*Quercus kelloggii*).

Background

The bald eagle is a large raptor which ranges from Alaska to northern Mexico. It typically nests in large trees near lakes and rivers where its prey is plentiful. This species feeds primarily on fish and waterfowl; however, it is also known to

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scavenge large mammal carcasses. The bald eagle population declined dramatically in the 1960s due to the effects of pesticides causing egg shell thinning and reproductive failure. This species is federally-listed as Threatened and state-listed as Endangered.

The bald eagle rarely nests in southern California. However, small wintering populations are found scattered throughout the region. Big Bear Lake supports the largest of these wintering populations and may include as many as 30 individuals in peak years. This species is typically observed at Big Bear Lake between November and March.

Survey Methodology

The project site and the surrounding area was observed on four separate occasions in February 2002 for approximately four hours on each occasion. Trees on the property were visually scanned using binoculars and a spotting scope. Observations were conducted from various vantage points on the property, as well as from Windy Point, approximately 1/2 mile west of the property across Grout Bay. All trees utilized by eagles for perching and/or roosting during these surveys were marked with numbered, circular tree tags. Additionally, the San Bernardino National Forest Service was contacted and a review of their historic records of bald eagle use on the north shore of Big Bear Lake was completed.

Survey Results

Bald eagle observations were performed on February 7, 12, 14, and 21, 2002. Bald eagles were observed on the project site on all four occasions. A minimum of nine, seven, three, and four individual bald eagles were seen on the four observation dates, respectively. Bald eagles were observed perching in three, eight, two, and two separate trees on the project site on the respective observation dates. Nine individual trees were used on the project site by bald eagles during surveys. The sizes and descriptions of the trees used for perching are provided in Table 1. Tree locations on the project site are presented in Exhibit 3.

The best and most reliable data for reviewing historical use of the project site by bald eagles was an unpublished report by Devaud and Devaud in 1990 which presented the findings of surveys conducted during the winter of 1989-1990. The Devauds observed, mapped, and photographed bald eagle perch trees along the north shoreline of Big Bear Lake between December 10 and April 6 of that winter. Eighty of the 176 mapped eagle sightings (45 percent) were located on the project site. The most commonly recorded use of a single perch tree was also on the project site with 51 sightings (i.e., tree number 886). This is clearly the most important eagle perch tree on the project site and potentially the most important on the north shore of Big Bear Lake. The next most commonly recorded use of a single perch tree was off the project site near the east end of the lake with 32 sightings.

Recommendations

The project site contains several trees used extensively by this wintering population of bald eagles. Removal of these trees could restrict access to and/or affect the ability of individual eagles to forage in the vicinity of Big Bear Lake. Removal of important perch trees could be considered a significant impact under the federal and state Endangered Species Acts (ESA). It is recommended that the numbered trees presented in Table 1 are avoided during project construction and preserved in place upon project completion. Additionally, all large trees (i.e., greater than 20-inches diameter at four feet from ground) within approximately 200 yards of the

high water line should be considered potential perch trees, avoided during construction, and preserved in place upon project completion, if possible.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Principal, Biological Services

Samuel C. Stewart IV
Assistant Project Manager

R:\Projects\RBF\J008 Eagle Survey-041602.wpd

Enclosures: Table 1 and Exhibits 1-3

References

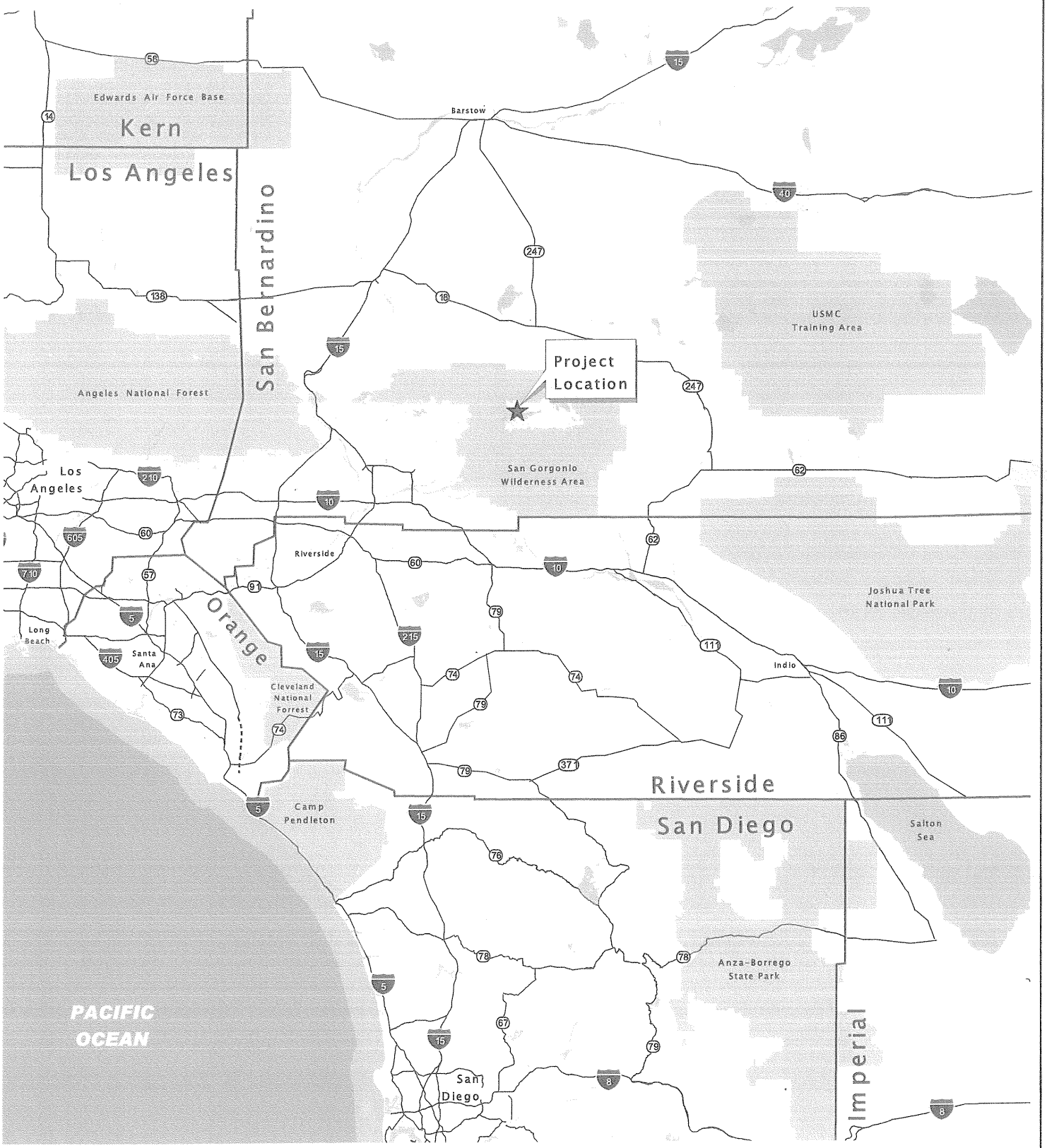
Devaud J. & Devaud S. 1990. *Bald Eagle Habitat Use of the North Shore of Big Bear Lake, San Bernardino County, California.* Unpublished Document in San Bernardino National Forest Service Files.

Environmental Planning Consultants. 1988. *Big Bear Lake Bald Eagle Cumulative Impact Study.* Unpublished Document in San Bernardino National Forest Service Files.

TABLE 1
BALD EAGLE PERCH TREES

Tree Number	DBH* (inches)	Tree Height (feet)	Condition	Eagle Observations
880	26	68	Dead top	2
881	29	77	Top 20% dead	1
882	21	44	Young tree, live top	1
883	42	98	Dead top, lower branches dying	3
884	40	112	Needles thinning on upper 25%	1
885	31	91	Snag	1
886	46	109	Top 15% of tree dead	2
887	32	88	Top 25% of tree dead	2
888	48	105	Healthy, flattened growth	1

* Diameter at Breast Height (four feet from base) in inches



Regional Location

Exhibit 1

Tentative Tract 16136

N W E S

10 0 10 20 Miles

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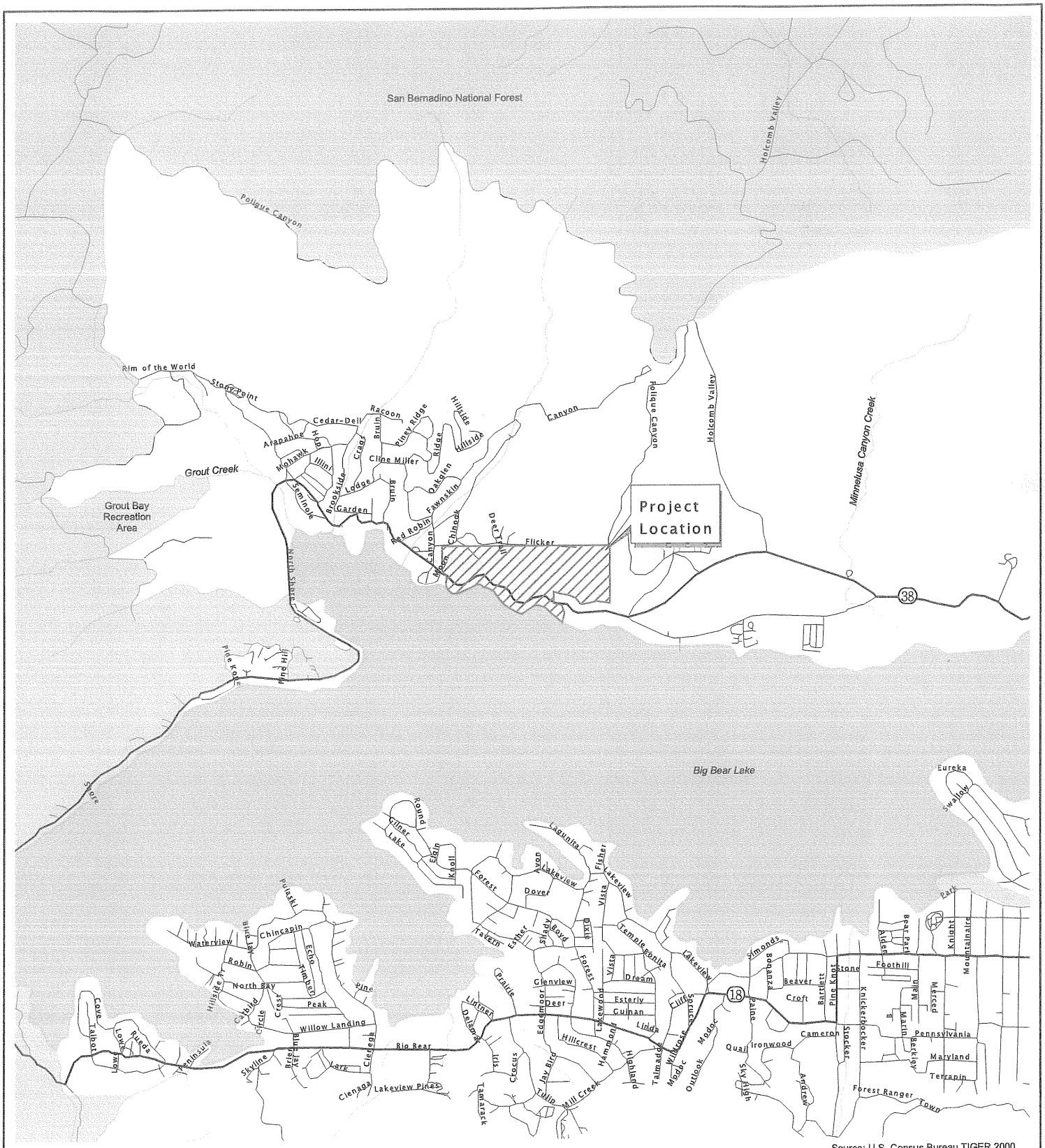

Source: U.S. Census Bureau TIGER 2000

Local Vicinity

Exhibit 2

Tentative Tract 16136

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888
883
880
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Big Bear Lake

Bald Eagle Perch Tree Locations
Project Boundary

Bald Eagle Perch Tree Locations

Exhibit 3

Moon Camp - Tentative Tract 16136

Not to Scale

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Bald Eagle Perch Tree Locations

Moon Camp - Tentative Tract 16136

Not to Scale
Source: Lilburn Corporation

Exhibit 3

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An Environmental Planning/Resource Management Corporation

August 23, 2002

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
Irvine, CA 92718

Subject: Results of Southwestern Willow Flycatcher Surveys on Moon Camp – Tentative Tract 16136, Unincorporated San Bernardino County, California

Dear Mr. Lajoie:

This letter report presents the results of focused surveys to evaluate the presence or absence of the southwestern willow flycatcher (Empidonax traillii extimus) performed on Moon Camp – Tentative Tract 16136 (hereafter referred to as the project site). The project site consists of an approximately 62.5-acre parcel on the north shoreline of Big Bear Lake, San Bernardino County, California. The project site is covered by the U.S. Geological Survey's Fawnskin, California Quadrangle at Township 2N, Range 1E, and includes portions of Sections 7 and 12. The regional location and local vicinity of the project site are shown on Exhibits 1 and 2, respectively.

The proposed project involves the subdivision of the project site into developable parcels. The purpose of the survey was to determine presence or absence of the southwestern willow flycatcher on the project site in order to assess impacts associated with its development. Surveys were conducted according to guidelines established by the U.S. Fish and Wildlife Service (USFWS) and by biologists with the necessary federal Endangered Species Act (ESA) survey permits.

SPECIES BACKGROUND

The southwestern willow flycatcher (SWF) was formerly a more common and widespread summer resident of southern California's lowland riparian woodlands (Grinnell and Miller 1944, Garrett and Dunn 1981). The substantial population decline of this avian species over the latter half of the 20th century is attributable to the loss and degradation of riparian habitats and, perhaps more importantly, brood parasitism by the brown-headed cowbird (*Molothrus ater*). As a result, all willow flycatchers breeding in California, which includes the subspecies *E. t. brewsteri* and *E. t. adastus*, in addition to SWF, were listed by the California Department of Fish and Game (CDFG) as Endangered on January 3, 1991. The USFWS listed the SWF as Endangered on February 27, 1995 (USFWS 1995).

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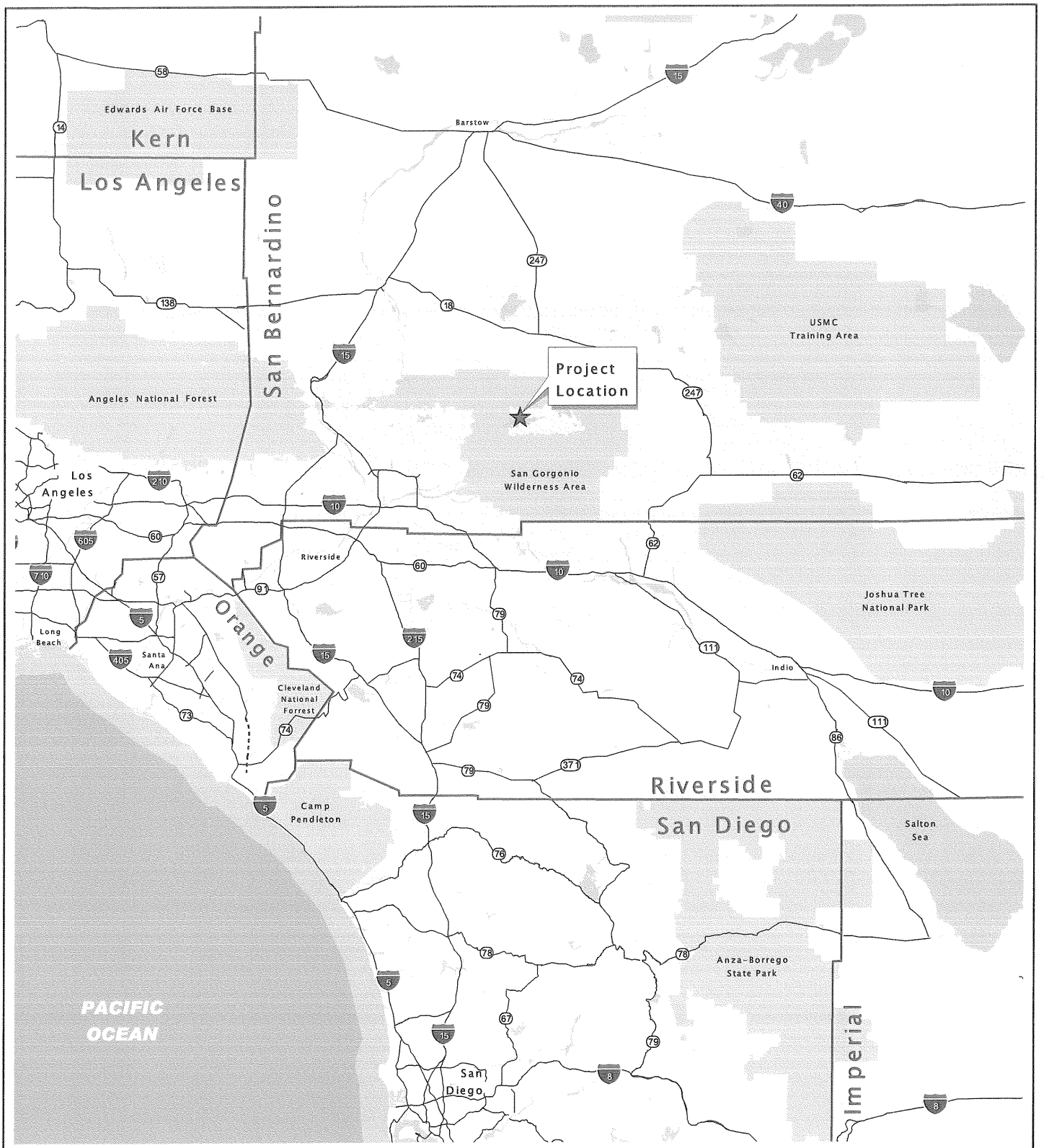

Regional Location

Exhibit 1

Moon Camp - Tentative Tract 16136

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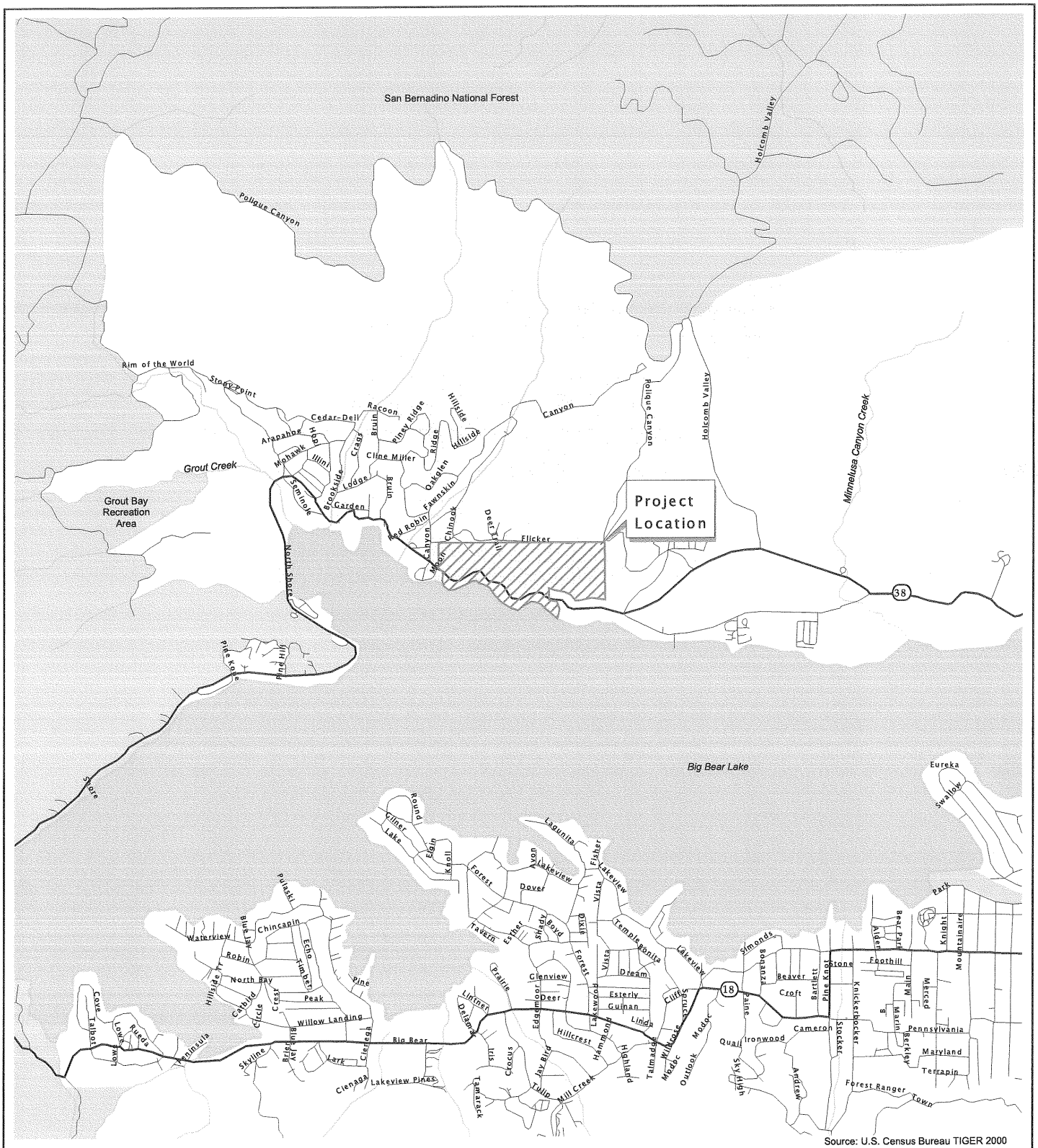

Source: U.S. Census Bureau TIGER 2000

Local Vicinity

Exhibit 2

Moon Camp - Tentative Tract 16136

N W E S

0.25 0 0.25 0.5 Miles

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The willow flycatcher is a neotropical migrant that breeds in the west from northern Baja California to central British Colombia and generally east through the northern half of the United States to the Atlantic coast (A.O.U. 1998). The willow flycatcher winters in Central America from Nayarit, Mexico (Pacific coast) and Honduras (Gulf of Mexico coast) to Panama and also to northern Colombia and northwest Venezuela (Sedgwick 2000). Depending on the authority, there are four or five recognized subspecies of willow flycatcher (Sedgwick 2000). The breeding range of the SWF includes southern California, Arizona, New Mexico, western Texas, and extreme southern parts of Nevada and Utah (USFWS 1993). The California range of the SWF is north along the coast to the Santa Ynez River, Santa Barbara County, and north in the interior to the Owens River, Inyo County (Unitt 1987, USFWS unpubl.). The largest breeding populations of SWF in California are located at the South Fork of the Kern River, Kern County; the Santa Ynez River, Santa Barbara County; and the Upper San Luis Rey River and Santa Margarita River, San Diego County. The range-wide population of SWF is estimated at between 300 and 500 pairs (USFWS 1997a). The population of SWF in California is estimated to be about 70 pairs (USFWS 1993). Recent estimates, such as a total of 117 pairs in 1999 (USFWS unpubl.), indicate that the southern California SWF population may slowly be recovering.

The SWF breeds in willow dominated riparian habitats, with a strong dependence on willow thickets, for all its requirements (Grinnell and Miller 1944). In addition, the SWF appears to have a preference for sites with surface water in the vicinity, such as along streams, the margins of a pond or lake, and at wet mountain meadows (Grinnell and Miller 1944, Flett and Sanders 1987, Harris et al. 1987), and in Arizona the SWF invariably nests near surface water (Phillips et al. 1964). Recently, the SWF has adapted to introduced vegetation present in riparian communities, such as tamarisk (*Tamarix* sp.) and Russian olive (*Elaeagnus angustifolia*) (USFWS 1993).

The willow flycatcher is a common migrant in the interior of California and a rare to uncommon migrant along the coastal slope, with most birds during the spring season moving through southern California between May 15 and June 20 (Garrett and Dunn 1981, Unitt 1987). The spring migration of SWF is earlier than that of the northern subspecies (Unitt 1984, USFWS 1993). As a result, surveys for nesting SWF are complicated by the presence of more abundant subspecies migrating through the range of SWF during its breeding season.

On July 22, 1997, USFWS published a final critical habitat for this species (USFWS 1997a). A total of 99.8 river miles in Kern, Riverside, San Bernardino, and San Diego counties were designated for the SWF. The project site is not located within the designated critical habitat area for this species.

EXISTING HABITAT

The majority of the project site consists of dry chaparral and open Jeffrey pine (*Pinus jeffreyi*) forest to the north of Highway 18. With the exception of a few small red willows (*Salix laevigata*), the majority of onsite willows consist of shrubby Scouler willows (*Salix scoulerana*) with a maximum height of 20 feet, occurring in small patches near the shoreline of Big Bear Lake on the south side of Highway 18. Other plant species observed along the lake shoreline include willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), black cottonwood seedlings (*Populus balsamifera* spp. *trichocarpa*), and arroyo willow (*Salix lasiolepis*).

METHODS

Surveys for the SWF were conducted on May 25, June 16, 23, and 30, and July 13, 2002. These surveys followed the recommended USFWS guidelines. The survey protocol for SWF (USFWS 1997b) was revised on July 11, 2000. Instead of the previous minimum of three surveys, a total of five surveys must now be performed for all project-related SWF surveys. The surveys should be conducted in three specified time periods, at least five days apart. The first survey must be conducted between May 15 and May 31; the second survey must be conducted between June 1 and

June 21; and three surveys must be conducted between June 22 and July 17, with the first of the three final surveys conducted between June 22 and June 30. The surveys were conducted by Senior Biologist Jim Pike (Permit # PRT382946).

The willow habitat on the project site was systematically surveyed by walking slowly and methodically along its margin. Taped vocalizations of SWF were used to elicit a response from any potentially territorial SWF. If no SWFs were detected after the initial tape playing, the recording was usually replayed at least once. All, if any, observations of willow flycatcher (all subspecies), including pertinent behavior, were recorded and their locations mapped in the field onto topographic based maps.

The surveys were conducted under optimal weather conditions, and during the early morning hours when bird activity is at its peak. Numbers were recorded for all bird species detected during the surveys including notable observations of any special status species or other birds such as the brown-headed cowbird.

SURVEY RESULTS

No breeding SWF or individual willow flycatchers were detected during these surveys. Additionally, no federally- and/or state-listed Threatened or Endangered bird species, federal Species of Concern, or state Species of Special Concern were detected during surveys. One to two brown-headed cowbirds were detected on every survey.

CONCLUSION

Vegetation on the project site does not appear to provide suitable territorial or breeding habitat for the SWF. Although willow species are present adjacent to open water (i.e., Big Bear Lake), these willows are patchy and lack the dense growth or willow thicket required by the SWF. Therefore, this species is not expected to territorialize or breed on the project site.

Please call Ann Johnston or Sam Stewart at (714) 444-9199 with any questions.

Respectfully submitted,

BONTERRA CONSULTING

Ann M. Johnston
Principal, Biological Services

Samuel C. Stewart IV
Assistant Project Manager/Ecologist

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cc: Jim Pike

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August 23, 2002

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
Irvine, CA 92718

Subject: Results of Spotted Owl Surveys on Moon Camp – Tentative Tract 16136, Unincorporated San Bernardino County, California

Dear Mr. Lajoie:

This letter report presents the results of focused surveys for the California spotted owl (*Strix occidentalis occidentalis*) on the Moon Camp – Tentative Tract 16136 (hereafter referred to as the project site). The project site consists of an approximately 62.5-acre parcel on the north shoreline of Big Bear Lake, San Bernardino County, California. The project site is covered by U.S. Geological Survey's Fawnskin, California Quadrangle at Township 2N, Range 1E, and includes portions of Sections 7 and 12. The regional location and local vicinity of the project site are shown on Exhibits 1 and 2, respectively.

The proposed project involves the subdivision of the project site into developable parcels. The purpose of the survey was to determine presence or absence of the California spotted owl on the project site. Surveys were conducted according to methods established by the U.S. Forest Service (Forsman 1983).

SPECIES BACKGROUND

The spotted owl is a large, dark-eyed owl that is typically found in dense forests of western North America and Mexico (Gutiérrez et al. 1995). The California subspecies range includes the Sierra Nevada, the coastal ranges of central and southern California, and the Sierra Juárez and Sierra San Pedro Mártir of Baja California.

Spotted owls are found in mature forests, typically where there is a dense, multi-layered canopy. Nest stands often have a well-developed hardwood understory (e.g., canyon live oak [*Quercus chrysolepis*]) and a conifer overstory. However, some high-elevation territories (above 6,500 feet) consist primarily or solely of conifers and some low-elevation territories (below 3,000 feet) are found in pure hardwood stands. Territory sizes vary widely depending on habitat type, with territories becoming larger in the high-elevation, conifer-dominated sites (LaHaye et al. 1997).

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This owl feeds primarily on rodents, and woodrats (*Neotoma* spp.) compose a large proportion of its prey base in southern California (Smith et al. 1999). In the southern portion of its range, the California spotted owl occurs in a series of semi-isolated populations in a small number of the largest mountain ranges in the region (LaHaye et al. 1994). Throughout its range, this species has declined due to the removal of older forests through logging. This situation prompted the U. S. Fish and Wildlife Service (USFWS) to list the Northern (*S. o. caurina*) and Mexican subspecies (*S. o. lucida*) as Threatened under the federal Endangered Species Act (USDI 1990, 1993). Currently, the USFWS is reviewing the status of the California subspecies to determine whether a similar listing is warranted.

EXISTING HABITAT

The project site occurs on a generally south facing slope that supports low density Jeffrey pine (*Pinus jeffreyi*) and mixed conifer forests with several areas that are nearly treeless. Spotted owls typically require dense, closed canopied forests for roosting and nesting (Bill LaHaye et. al. 1994). In southern California, suitable nesting and roosting habitat are usually found on north facing slopes or in steep canyons.

METHODS

The project site and the surrounding area were surveyed at night on six occasions by walking predetermined survey routes designed to provide thorough survey coverage of the area. Surveys were conducted during the breeding season (April 1 through August 31). During the field surveys, individuals and pairs of owls were located by imitating their calls with the human voice or using taped broadcasts of their calls to elicit a response from the owls, as described by Forsman (1983). This owl is very vocal and territorial and usually readily responds to a perceived intruder. Owl observations during nighttime surveys were relocated during daylight to determine exact roost locations. All roost locations were evaluated to determine whether they were on or in close proximity to the project site. Surveys were conducted by William S. LaHaye and Brian Kertson.

RESULTS

Six nighttime surveys and one roost location survey were performed on and in the vicinity of the project site. These surveys were conducted on April 25 and 30; May 6, 15, and 21; and June 10, 2002. A male spotted owl responded on April 25 approximately one mile north of the project site. This owl was later observed at its roost on May 6, 2002 at a different location that was also located approximately one mile north of the project site. This owl was observed at its roost location shortly before dusk and was followed until it left its roost to begin foraging. During the period of observation the male took several short flights but did not call to a mate, a behavior typical of paired spotted owls during the breeding season. Therefore, the observed owl was most likely a solitary male. No spotted owls were observed on, or within one mile of, the project site.

CONCLUSIONS

No spotted owls were observed on the project site. Additionally, given the south facing slope and low tree density, spotted owls are not expected to nest or roost on the project site. However, spotted owls are known to forage on forest habitats similar to those found on the project site and this owl is known to have large home ranges. Therefore, the project site could provide potential foraging habitat for the male spotted owl located approximately one mile north of the project site.

Thank you for the opportunity to assist on this project. If you have any questions or comments, please contact either Ann Johnston or Sam Stewart at (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Principal, Biological Services

Samuel C. Stewart IV
Assistant Project Manager/Ecologist

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cc: Bill LaHaye

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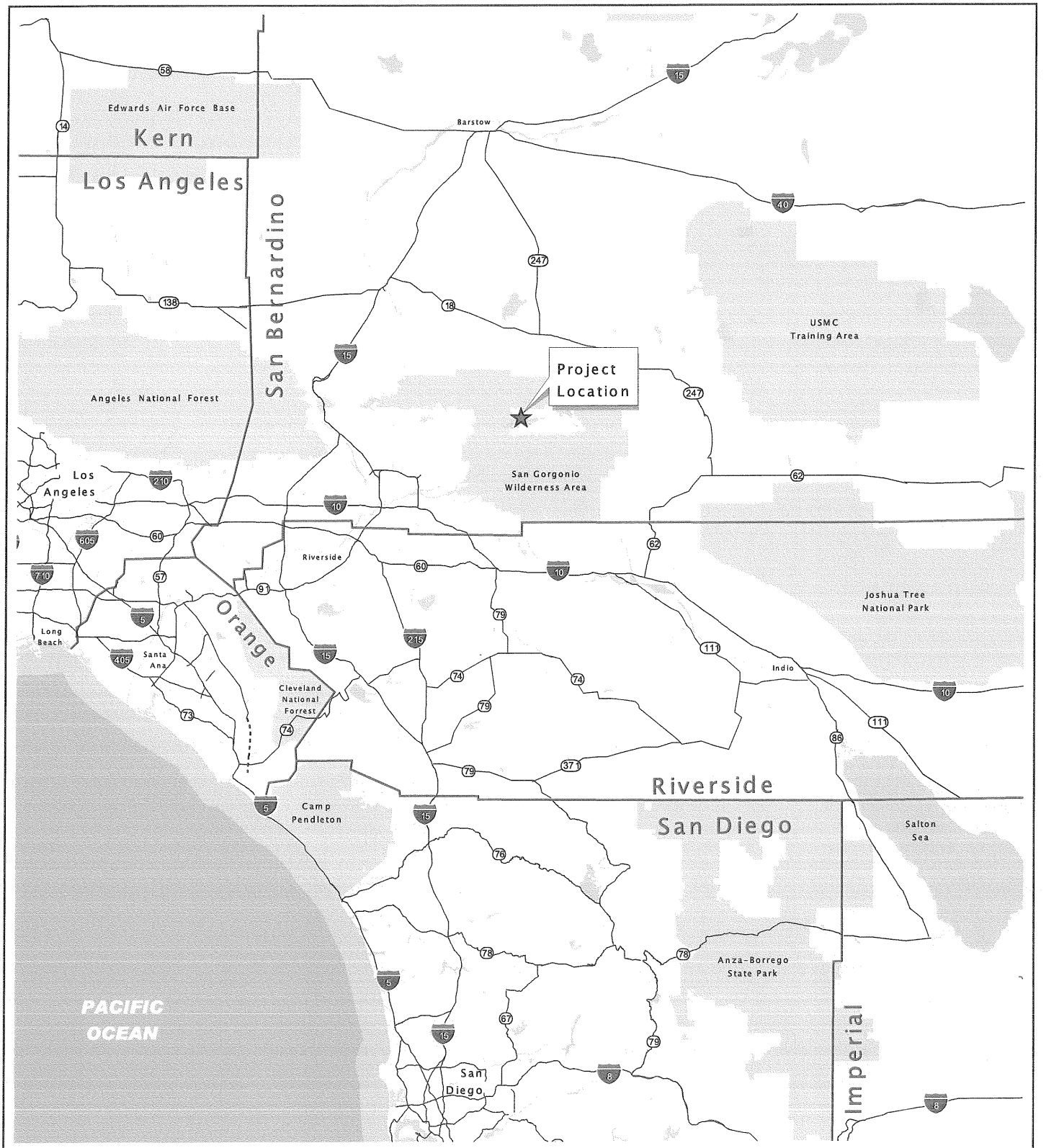

Regional Location

Exhibit 1

Moon Camp - Tentative Tract 16136

N W E S

10 0 10 20 Miles

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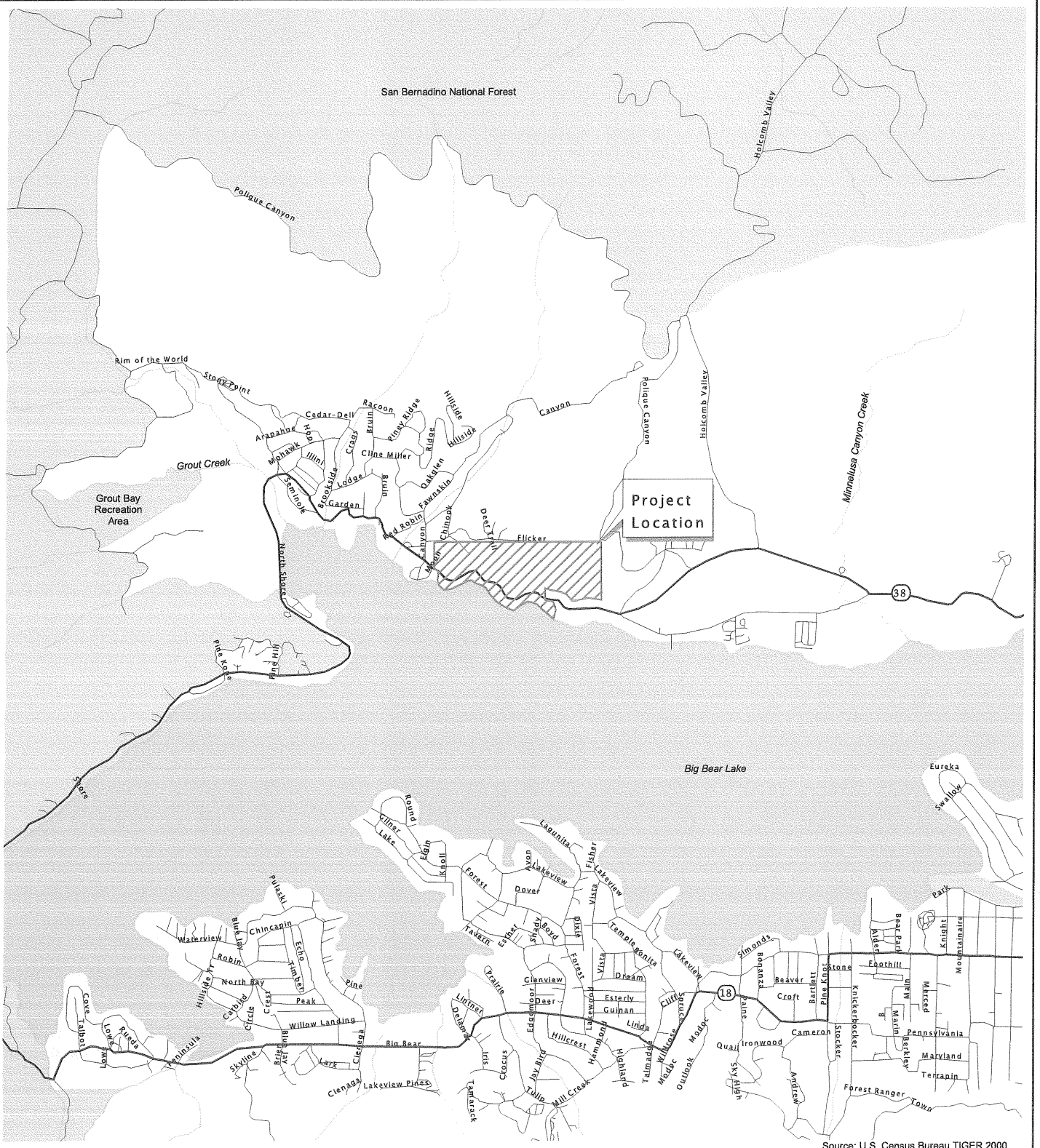

Local Vicinity

Exhibit 2

Moon Camp - Tentative Tract 16136

N W E S

0.25 0 0.25 0.5 Miles

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December 5, 2002

Mr. Glenn Lajoie
RBF Consulting
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Subject: Results of Rubber Boa Surveys on Moon Camp – Tentative Tract 16136, Unincorporated San Bernardino County, California

Dear Mr. Lajoie:

This letter report presents the results of focused surveys for the southern rubber boa (*Charina bottae umbratica*) on the Moon Camp project site – Tentative Tract 16136 (hereafter referred to as the project site). The project site consists of an approximately 62.5-acre parcel on the north shoreline of Big Bear Lake, San Bernardino County, California. The project site is covered by the U.S. Geological Survey's Fawnskin, California Quadrangle at Township 2N, Range 1W, and includes the northern portion of Section 13. The regional location and local vicinity of the project site are shown on Exhibits 1 and 2, respectively.

The proposed project involves the subdivision of the project site into ninety-two developable parcels. The purpose of the survey was to determine the presence or absence of the southern rubber boa on the project site. Surveys were conducted according to survey guidelines developed by the California Department of Fish and Game (CDFG) (CDFG undated) and operated under a Memorandum of Understanding issued by the CDFG.

SPECIES BACKGROUND

The southern rubber boa (SRB) is a state-listed Threatened species and federal Species of Concern, and is considered a sensitive species by the U.S. Forest Service in the San Bernardino National Forest (Stephenson and Calcarone 1999). Threats to the species include development (the majority of known occurrences are on private lands), off-road vehicles, and habitat destruction by collectors (Steinhart 1990).

The SRB is typically associated with moist coniferous forest and woodland habitats (Stewart 1977), although they may occur in a variety of habitats (Hoyer and Stewart 2000). They generally occur in the Tehachapi, San Bernardino and San Jacinto mountains within an elevation range of approximately 4,900 to 7,900 feet above mean sea level (msl) (Stewart 1988). The SRB spends most of its life

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underground and is only active during the early morning, late evening, or nighttime hours. Consequently, specimens are rarely encountered. It hibernates in rock outcrops, rotting logs, or other subterranean retreats until April or May (Steinhart 1990). Rock outcrops on southern exposures tend to be favored in spring as the snake emerges from hibernacula (Stewart 1988). Riparian and forested areas with more mesic conditions may be favored later in the season as the weather becomes warmer and drier (Stewart 1988), but there is no empirical data to support seasonal movements. In fact, Hoyer and Stewart (2000) found strong site fidelity in SRB recaptured during their 5-year study (19 of 21 recaptures were within 25 feet of the original capture site).

Most of the known SRB occurrences in the San Bernardino Mountains occur in a roughly 10 mile stretch between Twin Peaks on the west and Green Valley Lake on the east, including the Running Springs and Lake Arrowhead areas (Stewart 1988). Populations appear to be isolated, with tracts of apparently suitable habitat unoccupied. Dominant and representative trees in these occupied areas include Jeffrey pine (*Pinus jeffreyi*), ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), white fir (*Abies concolor*), incense cedar (*Callocedrus decurrens*), and black oak (*Quercus kelloggii*). One occurrence of the SRB in the Big Bear Valley was recorded in 1989 south of Big Bear Lake and east of the Snow Summit ski area, near the San Bernardino National Forest boundary. No SRB have been observed since. Stewart (personal communication 2001) suggests that SRB are probably widespread but not common in that area.

EXISTING HABITAT

The project site is located on a south facing slope along the north shore of Big Bear Lake. Most of the project site consists of open Jeffrey pine forest with scattered western juniper (*Juniperus occidentalis*) and black oak in the overstory. The tree canopy is especially open in the western half of the site, where the habitat matches published descriptions of "pebble plains" (Derby & Wilson 1978; 1979), a unique habitat type supporting several listed Threatened or Endangered plant species. At the eastern end of the project site, especially around a mapped ephemeral stream where topographic relief is higher than elsewhere, overstory canopy is higher. Beneath the trees, there is an open shrub layer including Great Basin sagebrush (*Artemisia tridentata*), curlleaf mountain mahogany (*Cercocarpus ledifolius*), birchleaf mountain mahogany (*C. betuloides*), and cupleaf ceanothus (*Ceanothus greggii*). The herbaceous layer includes a variety of grasses and herbs. Standing dead trees, fallen trees, and leaf litter are fairly common in this portion of the project site.

Patches of meadow and riparian habitat occur along the southern margin of the project site, between Highway 38 and the lake shore. Dominant herbaceous species include sedges (*Carex* spp.), rushes (*Juncus* spp.), and grasses (genera unknown). Shrubby willow trees (*Salix* sp.) occur in scattered patches.

Potentially suitable habitat for the SRB occurs in the drainage in the eastern portion of the project site. The combination of steeper slopes and higher tree densities (of both Jeffrey pine and black oak) results in leaf litter accumulation, well developed soils, and more mesic conditions overall. Standing dead trees, fallen trees, and leaf litter characteristic of this portion of the project site is similar to descriptions of where SRB may occur during the warmer, drier summer months.

The western half of the project site does not provide suitable habitat because of the open, dry conditions. The substrate consists of cobble. Leaf litter or other cover material is lacking. Several off-road vehicle tracks traverse this portion of the project site. Additionally, the patches of meadow and riparian habitat occurring along the southern margin of the project site between Highway 38 and the lake shore do not provide suitable habitat because of the lack of leaf litter accumulation and well developed soils.

METHODS

The draft survey guidelines developed by the CDFG (CDFG undated) for the SRB includes three years of repeated intensive active searches before a determination of absence can be made. Intensive active searches of suitable habitat for SRB are similar to the visual encounter survey (VES) method described by Crump and Scott (1994) in which a subsample of sites exhibiting high value habitat within the site as a whole are surveyed intensively for presence.

The draft guidelines allow for negative findings in less than three years (in two years) if trapping is conducted. Trapping consists of the use of a system of pitfall traps connected by drift fences, known as arrays, to capture SRB. Surveys reported here included a combination of both survey techniques simultaneously to maximize probability of detecting SRB, if present. This combination of surveys is expected to provide the surveying biologist with adequate data to identify the likelihood of presence/absence with an acceptable level of confidence in one season.

Surveys for SRB are best conducted as they emerge from hibernacula through their peak activity season (March 15 to May 15). The draft guidelines state that "surveys shall be conducted every one to two weeks" during that period. Recommended survey times range from 0900 to 1200 hours and from 1600 to 1900 hours but may vary depending on cloud cover, temperature, and humidity. On overcast days, surveys may be conducted between 1000 and 1600 hours. There is no guidance from the CDFG in the draft guidelines regarding the number of trapping periods or the number of days that traps should be opened when using arrays. The only requirement is that arrays should be in place before 15 March of the survey year.

Prior to conducting the focused survey for the SRB, a literature search and a reconnaissance level biological survey was conducted on December 10, 2002 by Brian Leatherman and Scott White to assess existing habitat and its potential suitability for a variety of special status plants and wildlife. The literature search included a review of the most recent version of the California Natural Diversity Data Base (CDFG 2002, Fawnskin and Big Bear Lake USGS quadrangles) and other relevant available documents to determine if and to what extent special status species, including the SRB, are known to occur in the area.

Visual encounter surveys were conducted on April 25 and 30, May 15 and 21, and August 29, 2002. Biologists who participated in some or all of the surveys included Mr. Leatherman, Bill La Haye, Sam Stewart, and Brian Kertson. All surface objects that potentially provided suitable refugia for the SRB (and could be moved by one or two people) were dislodged and checked under and replaced. Surface objects included small rock piles, boulders, wood debris, log piles, and natural downed logs. In addition, leaf litter was raked and sifted down to the ground surface under shrubs and forest areas where moist conditions result in suitable microhabitat sites.

Use of drift fences and pitfall traps as a survey technique is described in detail by Corn (1994) and others. The technique has been modified here to focus the effort on the capture of SRB. Four 100-foot long arrays were used to try to capture SRB. Each of the four arrays consisted of four five-gallon buckets (which act as pitfalls), one piece of carpet (which provides artificial refugia for SRB), and one snake funnel trap. The buckets were countersunk into the ground and placed more or less equidistant from each other with one bucket at each end of the drift fence. The carpet pieces, which were approximately 18 by 24 inches in size, were placed nap down and covered over with a thin layer of leaf litter. Each funnel trap was constructed of quarter inch hardware cloth (wire mesh) and were approximately 3 feet long and 6 inches in diameter with 8 inch inverted cones (funnels) inserted into each end.

The four arrays were concentrated within the SRB habitat at the eastern end of the project site and located to maximize the likelihood of capturing SRB, if present (see Exhibit 3). The arrays were operated under a Memorandum of Understanding from the CDFG because of the SRB's state listed Threatened status. Arrays were installed on March 12, 2002, and removed on the final day of trapping on August 30, 2002. Trap locations were determined by Mr. Leatherman, who installed them with assistance from Mr. LaHaye and Mr. Stewart. Mr. LaHaye monitored the traps daily when in operation per the MOU.

The arrays were operated during three separate trapping periods of ten days each. The trapping periods were from April 28 to May 5, June13-22, and August 21-30, 2002. The first trapping period was intended to coincide with the peak period of SRB emergence from hibernacula in the San Bernardino Mountains, based on a recent five-year study by Hoyer and Stewart (2000). The subsequent periods were intended to coincide with the period in which SRB may move into more mesic areas (like the area sampled).

RESULTS

No SRB were captured or observed during the 2002 focused survey efforts. A summary of the species captured in the arrays is provided in Table 1. Several species were also observed during independent visual encounter surveys, but due to the focus of this effort on the detection of snakes (not lizards or other species) and the intensive nature of the sampling effort, detailed notes on the species observed were not recorded in the field. Several lizard species were observed during the visual encounter surveys, including sagebrush lizards (*Sceloporus graciosus*), western skinks (*Eumeces skiltonianus*), and southern alligator lizards (*Elgaria multicarinatus*), but all of these were also detected in the arrays. The only species detected during visual encounter surveys but not captured in the arrays was one western rattlesnake (*Crotalus viridis*) observed on August 29, 2002.

TABLE 1
SUMMARY OF WILDLIFE CAPTURED IN ARRAYS – 2002

SPECIES	TRAPPING PERIOD			
	4/28 - 5/5	6/13 - 6/22	8/21 - 8/30	Total
Reptiles				
Sagebrush Lizard (*Sceloporus graciosus*)	9	27	29	65
Western Fence Lizard (*Sceloporus occidentalis*)	0	0	1	1
Western Skink (*Eumeces skiltonianus*)	2	36	29	67
Southern Alligator Lizard (*Elgaria multicarinatus*)	3	4	1	8
Mammals				
Ornate Shrew (*Sorex ornatus*)	0	1	4	5
Brush Mouse (*Peromyscus boylii*)	0	0	2	2
Dusky-footed Woodrat (*Neotoma fuscipes*)	0	1	0	1
California Vole (*Microtus californicus*)	0	1	0	1
Total	14	70	66	150

CONCLUSIONS

SRB have been detected in a variety of vegetation types in the San Bernardino Mountains by Hoyer and Stewart (2000). Occupied habitat at these locations ranged from grasses and ferns in relatively open areas with sparse shrubs and small deciduous trees, to coniferous or deciduous forest or a mixture of both. The one common component of all sites was the presence of small to large rock outcrops interspersed throughout the area. Rock outcrops, which are known to provide hibernacula (Stewart 1988), also appear to represent an important component of preferred habitat for the SRB. Rock outcrops do not occur on the project site.

The use of cover objects for detecting rubber boas in known occupied habitat has been shown to be highly successful. At a study site in Oregon where natural cover objects were lacking, Hoyer and Storm (1992) relied entirely on artificial cover objects to capture rubber boas. Hoyer and Stewart (2000) showed that the number of SRB detected per unit time was substantially greater for artificial cover objects compared to natural cover (1.76/hr vs. 0.40/hr respectively). No boas were found under artificial cover objects placed along the arrays or under natural cover during the proposed project surveys.

The proposed Moon Camp project site is on a south-facing slope where open dry conditions prevail. The easternmost portion of the site has higher tree density, more leaf litter, more developed soils, and downed logs that provide limited habitat for the SRB. This eastern portion was surveyed intensively using two focused survey techniques: visual encounter surveys and arrays with drift fences, pitfall traps, snake funnel traps, and artificial cover (i.e. carpet). No SRB were captured or observed during the focused survey efforts. Given the lack of historical records for the immediate project area, the lack of rock outcrops that appear to be an important component of occupied habitat, and the negative results of two independent focused survey techniques in the best SRB habitat on the project site, the SRB is not presently expected to occur on the project site.

Thank you for the opportunity to assist on this project. If you have any questions or comments, please contact either Ann Johnston or Sam Stewart at (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Ann M Johnston / JMS

Ann M. Johnston
Principal, Biological Services

Samuel C. Stewart IV
Assistant Project Manager/Ecologist

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Attachments: Exhibits 1, 2 and 3

cc: Brian Leatherman

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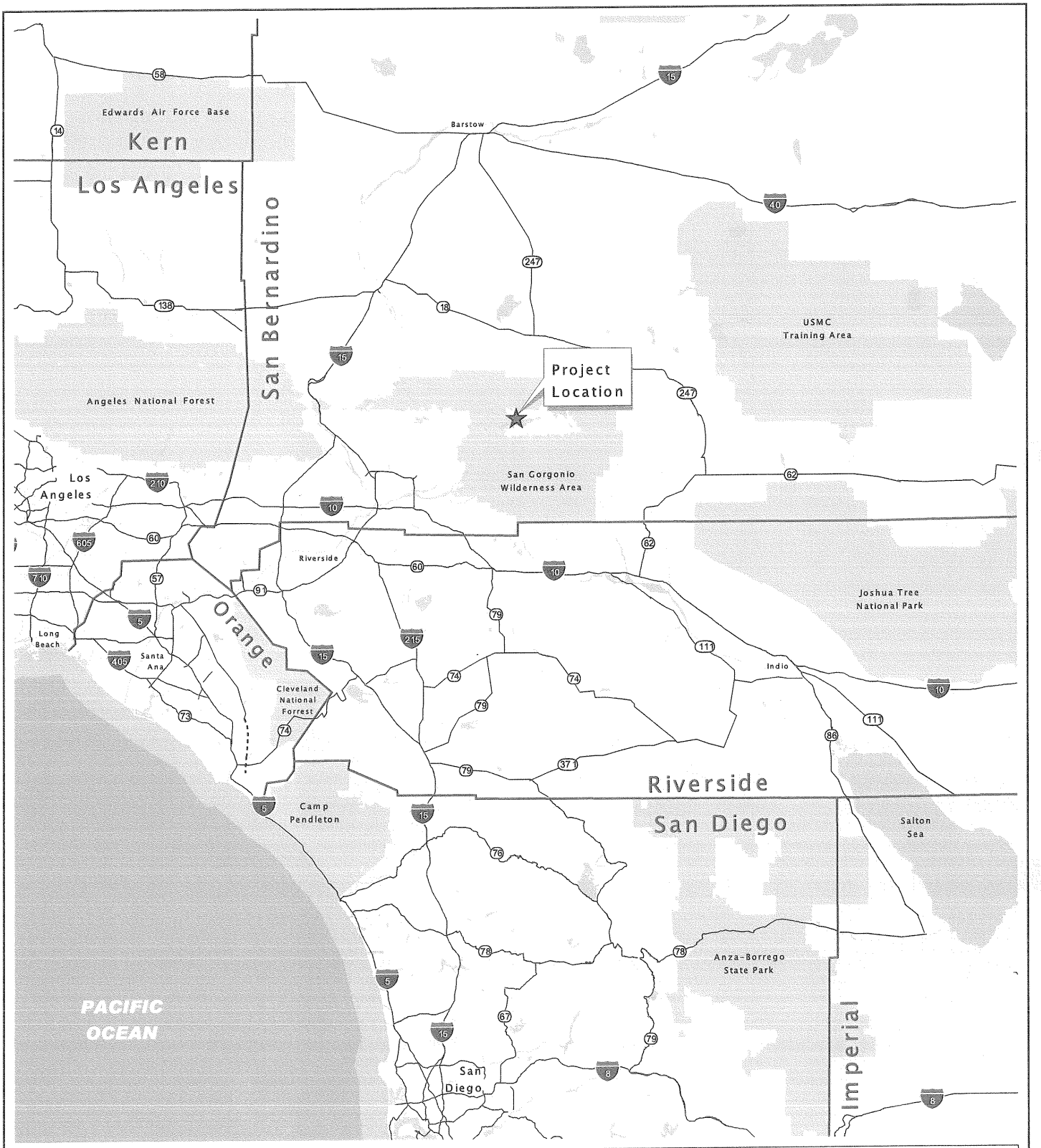

Regional Location

Exhibit 1

Moon Camp - Tentative Tract 16136

N W E S

10 0 10 20 Miles

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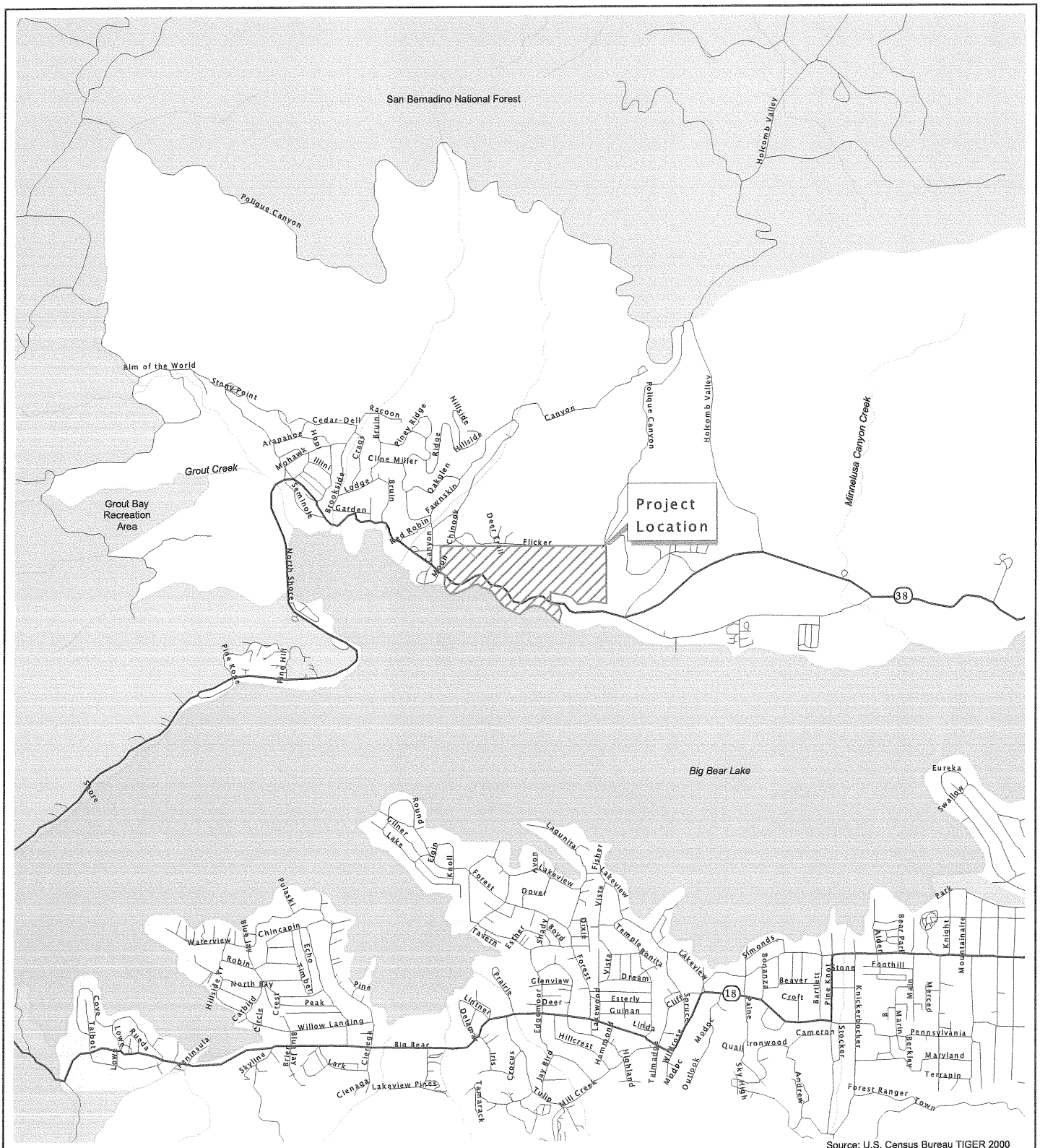

Local Vicinity

Exhibit 2

Moon Camp - Tentative Tract 16136

N W E S

0.25 0 0.25 0.5 Miles

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Pitfall Trap Array Locations

Moon Camp - Tentative Tract 16136

Scale: Not to Scale
Source: Lilburn Corporation

Exhibit 3

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December 17, 2002

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
Irvine, CA 92718

VIA FACSIMILE AND MAIL
(949) 472-8373

Subject: Results of Botanical Surveys on Moon Camp – Tentative Tract 16136, Unincorporated San Bernardino County, California

Dear Mr. Lajoie:

This letter report presents the findings of the botanical survey on the proposed Moon Camp – Tentative Tract 16136 project in unincorporated San Bernardino County, California (hereafter referred to as the project site). The project site consists of an approximately 62.5-acre parcel on the north shoreline of Big Bear Lake, in San Bernardino County, California. It is located on the north and south sides of State Highway 38 (also called North Shore Drive) and is bound to the east by Polique Canyon Road and to the west by Oriole Lane. The project site is covered by the U.S. Geological Survey's (USGS) Fawnskin 7½-minute, California Quadrangle at Township 2N, Range 1W, and includes a portion of Section 13. The regional location and local vicinity of the project site are shown on Exhibits 1 and 2, respectively.

The project site consists of vacant land sloping from north to south with elevations ranging from 6,960 feet above mean sea level (msl) in the northern portion to 6,750 feet above msl at the lakeshore (southern portion). Two minor natural drainage channels cross the site from north to south, draining into Big Bear Lake. The first channel, near the eastern property boundary, is mapped as an intermittent "blueline" stream on the USGS Fawnskin 7½-minute Quadrangle. The other channel is located near the center of the project site and is not mapped as a "blueline" stream.

The proposed project involves the subdivision of the project site into 92 developable parcels. The purpose of the survey was to determine the presence/absence and extent of special status plant communities and plant species known to occur in the region. Special status plants (ash-gray Indian paintbrush [*Castilleja cinerea*] and silver-haired ivesia [*Ivesia argyrocoma*]) and a special status plant community (pebble plain) were identified on the project site during previous surveys (MBA 2000). Special status plant species known to occur in the project region are listed in Appendices A and B.

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SURVEY METHODS

Consulting botanist Scott D. White and consulting biologist Brian Leatherman visited the site on December 11, 2001 to evaluate potentially suitable habitat for special status plants and animals and determine the need for further focused biological surveys. Botanical surveys were conducted on May 11 and June 26, 2002 by BonTerra Consulting biologist Sandra Leatherman and Mr. White. Additionally, the site was visited on November 14, 2002 by Mr. Leatherman to map the extent of Threatened or Endangered plant species habitat with a GPS unit. All areas of the project site containing native habitats potentially suitable for the special status species, as determined in previous biological surveys, were sampled using meandering transects. Plant species were identified in the field or collected for future identification. Plants were identified using keys in Hickman (1993), Munz (1974), or Abrams (1923, 1960). Taxonomy follows Hickman (1993) for scientific and common names, or current taxonomic references (e.g., scientific journals). A complete list of plant species observed on the project site is included in Appendix C. Voucher specimens were collected for all special status species and deposited in the Rancho Santa Ana Botanical Gardens Herbarium by Mr. White and Ms. Leatherman.

SURVEY RESULTS

Botanical surveys during 2002 were limited on the project site and throughout southern California due to a very poor rainfall year. Many plant species are either annual (i.e., complete their life cycles in a single year and then die) or perennial herbs (i.e., die back to the ground level each year and persist as underground bulbs or rootcrowns). In poor rainfall years, annual and perennial herbs may not be visible, though they may exist on a site as an inactive seed, bulb, or rootcrown. Most of the special status plants of the Big Bear area are perennial herbs, making a conclusive determination of "presence" or "absence" based on field surveys difficult. In many cases, previous reports of presence and determination of habitat quality were used to estimate the probability that a special status plant species might occur on the project site.

Vegetation Types

Three vegetation types (Jeffrey pine forest, pebble plain, and lake shoreline) were identified on the project site during the surveys. They are described below and their distribution on the project site is illustrated on Exhibit 3.

Jeffrey Pine Forest

Jeffrey pine forest is the most dominant vegetation type on the project site occuring on approximately 54.91acres throughout the project site north of Highway 38. Jeffrey pine forest was described by Holland (1986) and is also called montane coniferous forest by Munz (1959). This vegetation type occurs in mountains throughout most of California from approximately 5,000 to 9,000 feet above msl. This vegetation type is dominated by Jeffrey pine (*Pinus jeffreyi*) with white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occurring at lower densities. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), cupleaf ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches.

Portions of the Jeffrey pine forest on the project site provide suitable habitat for listed Threatened and Endangered plant species. In particular, areas of few trees and fairly open canopy where Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*) occurs are suitable habitat for

the federally-listed Threatened ash-gray Indian paintbrush, CNPS 1B listed Parish's rock-cress (*Arabis parishii*), and CNPS 1B listed silver-haired ivesia. For this reason, open Jeffrey pine forest is shown as a separate vegetation type on Exhibit 3. Additionally, areas within the Jeffrey pine forest where herbaceous cover is dominated by Wright's matting buckwheat are identified on Exhibit 3.

Lake Shoreline

Approximately 4.14 acres of the southern boundary of the project site is formed by the shore of Big Bear Lake. Plant species along the shore itself consisted primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Several seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*) also occur in this vegetation type. The lake was well below its maximum level in 2001 to 2002 due to acute drought conditions. Vegetation is patchy above the high-water level where small areas of Jeffrey pine forest are interspersed among open meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laviegata*).

Special Status Vegetation Types

One special status vegetation type (pebble plain) was observed on the project site during surveys. Additionally, one special status plant community (meadow) was determined to have a high likelihood to occur on the project site. The following section describes the localities, habitats, and associated species of the special status vegetation types on the project site. Locations of special status vegetation types observed on the project site are shown on Exhibit 3.

Pebble Plain

Pebble plain occurs on approximately 0.63 acre restricted to the western portion of the project site north of Highway 38. Pebble plain (also called pavement plain) is endemic to the San Bernardino Mountains at elevations between 6,000 and 7,500 feet above msl (Stephenson and Calcarone 1999). The substrate consists of clay soils with quartzite pebbles and gravel that are continually pushed to the surface, evidently through frost action (Holland 1986). Vegetation structure of pebble plain habitat is similar to the mat-forming structure of alpine sites at much higher elevations (Derby and Wilson 1978). Vegetation consists largely of well-spaced cushion-forming perennials and a variety of tiny annuals. Bunchgrasses and some succulents may also occur. Several special status plants, including several Threatened or Endangered species, are known to occur on pebble plain habitat and are discussed in the special status plant section.

Pebble plain on the project site and in general occurs as distinct open patch within the surrounding open Jeffrey pine forest. Much of the pebble plain habitat on the project site has been disturbed by unauthorized off-road vehicle traffic. This disturbance has reduced vegetation cover, disturbed the natural hydrologic pattern, and perhaps reduced habitat quality for special status plants. However, based on National Forest management efforts at other sites, vehicle disturbance apparently does not permanently alter habitat suitability of this vegetation type. Degraded pebble plains in the Sugarloaf area fenced by the Forest Service have experienced returned plant diversity after a few years (Neel and Barrows 1990).

Pebble plains have a very limited distribution in the northeastern San Bernardino Mountains. They are found only within a 92-square mile area near the city of Big Bear, on the San Bernardino National Forest and adjacent private lands (Neel and Barrows 1990). Several of the plants associated with pebble plain soils, including the Bear Valley sandwort (*Arenaria ursina*), ash-gray Indian paintbrush, and southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*) are federally-listed Threatened and Endangered species endemic to this vegetation type. As such,

pebble plains are considered by the CDFG to be "a series or association considered rare and worthy of consideration" (CDFG 2001).

Meadow

Small patches of meadow transitioning into upland grassland occur along the lakeshore south of Highway 38. The extent of the meadows could not be determined or mapped in 2002 due to dry conditions. Meadows in the Big Bear Valley may be perennially saturated (i.e., wet meadows) or may have seasonally saturated soils during wet years (i.e., vernal meadows). This vegetation type is generally dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.), and grasses (*Poa* spp., *Elymus* spp.). Dry meadows and the margins of wet meadows may also support big sagebrush (*Artemisia tridentata*) and timberline sagebrush (*Artemisia rothrockii*).

Meadow habitat in the San Bernardino Mountains is not officially recognized as a special status vegetation type by the CDFG but it is known to support several locally endemic plants (e.g., bird's foot checkerbloom [*Sidalcea pedata*], San Bernardino bluegrass [*Poa atropurpurea*], and California dandelion [*Taraxacum californicum*]) and is therefore considered to be of local concern. Additionally, the San Bernardino National Forest recognizes montane meadow habitat as a rare ecological community of concern.

Special Status Plants

The botanical surveys located populations of the ash-gray Indian paintbrush, Parish's rock-cress, Big Bear Valley woollypod (*Astragalus leucolobus*), Heckard's paintbrush (*Castilleja montigena*), and silver haired ivesia on the project site. Additionally, the site contains suitable habitat for the Bear Valley sandwort, Munz's mariposa lily (*Calochortus palmeri* var. *munzii*), Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*), San Bernardino Mountain owl's clover (*Castilleja applegateii* ssp. *martinii*), San Bernardino Mountains dudleya (*Dudleya abramsii* ssp. *affinis*), leafy buckwheat (*Eriogonum foliosum*), southern mountain buckwheat, Baldwin Lake linanthus (*Linanthus killipii*), San Bernardino Mountain monkeyflower (*Mimulus exiguus*), Bear Valley phlox (*Phlox dolichantha*), San Bernardino bluegrass, Parish's checkerbloom (*Sidalcea hickmanii* ssp. *parishii*), bird's foot checkerbloom, southern jewelflower (*Streptanthus campestris*), and California dandelion and the majority of these species were determined to have a moderate to high likelihood to occur on the project site. The following section describes the localities, habitats, and associated species of the special status plant locations on the project site.

Ash-Gray Indian Paintbrush (*Castilleja cinerea*)

Ash-gray Indian paintbrush is a federally-listed Threatened and CNPS List 1B species. It is a root parasite on other plants, often parasitizing the federally-listed Threatened southern mountain buckwheat and the mat-forming Wright's matting buckwheat. It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows, seeps, and open pinyon or Jeffrey pine forest from approximately 5,900 to 9,300 feet above msl and is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). This species was reported and mapped on the project site by Michael Brandman Associates (MBA) (MBA 2000) and in the California Natural Diversity Data Base (CDFG 2001). Botanical surveys in 2002 identified populations of this species throughout approximately 11.8 acres of pebble plain and open Jeffrey pine forest in the western half of the project site where it appears to be parasitizing Wright's matting buckwheat (see Exhibit 3). Populations of this species were found to be more widespread than reported previously and would be expected to occur in higher concentrations within the mapped Wright's matting buckwheat areas during normal rainfall years.

Parish's Rock Cress (*Arabis parishii*)

Parish's rock cress is a CNPS List 1B species. It is a perennial herb that typically blooms in April or May. It occurs in pebble plains or rocky sites with carbonate soils within pinyon juniper woodlands and montane coniferous forests from approximately 5,800 to 9,500 feet above msl. This species is endemic to the San Bernardino Mountains. It has been reported on the project site (CDFG 2001) and was observed uncommonly in scattered patches throughout pebble plain and open Jeffrey pine forest habitats on the project site.

Heckard's Paintbrush (*Castilleja montigena; C. applegateii* ssp. *martinii*)

Heckard's paintbrush is a CNPS List 4 species that typically flowers between May and August. This perennial herb occurs in montane forests from approximately 6,400 to 9,200 feet above msl. It is endemic to the San Bernardino Mountains where it occurs commonly in forest habitats throughout the mountain range. This species was observed in Jeffrey pine forest habitat throughout the project site.

Bear Valley Woollypod (*Astragalus leucolobus*)

Bear Valley Woollypod is a CNPS List 1B species that typically blooms between May and July. This perennial herb occurs in rocky soils of lower montane coniferous forest, pebble plain, pinyon and juniper woodland, and upper montane coniferous forest from approximately 5,700 to 8,750 feet above msl. It is endemic to the high mountains of southern California (San Bernardino, San Gabriel, San Jacinto, and Santa Rosa mountains). The entire project site is considered suitable habitat for this species and it was observed in small patches throughout the project site.

Silver-Haired Ivesia (*Ivesia argyrocoma*)

Silver-haired ivesia is a CNPS List 1B species that typically blooms between June and August. This perennial herb occurs in alkaline meadows and seeps, pebble plains, and upper montane coniferous forest from approximately 4,900 to 8,800 feet above msl. It occurs in the San Bernardino Mountains and a disjunct population occurs in the mountains of Baja California. This species was reported on the project site by MBA (MBA 2000) and was observed throughout mapped pebble plain habitat on the project site during the 2002 botanical surveys.

Bear Valley Sandwort (*Arenaria ursina*)

Bear Valley sandwort is a federally-listed Threatened and CNPS List 1B species that typically blooms from May to August. It is a perennial herb that occurs on pebble plains from approximately 6,400 to 6,900 feet above msl. This species is endemic to Big Bear Valley in the San Bernardino Mountains. Bear Valley sandwort was not encountered during the 2002 botanical surveys. However, this species has a high potential to occur give the presence of suitable habitat within pebble plains on the project site.

Munz's Mariposa Lily (*Calochortus palmeri* var. *munzii*)

Munz's mariposa lily is a CNPS List 1B species that typically blooms between June and July. This perennial, bulbiferous herb occurs in chaparral and lower montane coniferous forests from approximately 3,900 to 7,200 feet above msl. It is a California endemic found in Riverside County. This species was not observed during the 2002 botanical surveys. However, it has a moderate potential to occur on the project site given the availability of marginally suitable habitat throughout the project site.

Palmer's Mariposa Lily (*Calochortus palmeri* var. *palmeri*)

Palmer's mariposa lily is a CNPS List 1B species that typically blooms between May and July. This perennial, bulbiferous herb occurs in mesic chaparral, lower montane coniferous forest, meadows and seeps from approximately 3,200 to 7,200 feet above msl. It is a California endemic found in the South Coast and Transverse ranges in Kern, Los Angeles, Riverside, Santa Barbara, San Bernardino, San Luis Obispo, and Ventura counties. This species was not observed during the 2002 botanical surveys. However, it has a moderate potential to occur on the project site given the availability of marginally suitable habitat in mesic portions of Jeffrey pine forest.

San Bernardino Mountain Owl's Clover (*Castilleja applegateii* ssp. *martinii*)

San Bernardino Mountain owl's clover is a CNPS List 1B species that typically blooms between June and August. This hemiparasitic, annual herb occurs in mesic chaparral, meadows and seeps, pebble plain, and upper montane coniferous forests from approximately 4,200 to 7,850 feet above msl. It is a California endemic found in Riverside and San Bernardino counties. This species was not observed during the 2002 botanical surveys. However, it has a high potential to occur on the project site given the availability of suitable habitat throughout the project site, especially within pebble plains and open Jeffrey pine forest where Wright's matting buckwheat occurs.

San Benardino Mountains Dudleya (*Dudleya abramsii* ssp. *affinis*)

San Bernardino Mountains dudleya is a CNPS List 1B species that typically blooms between May and June. This perennial herb occurs in granitic, quartzite, or carbonate soils of pebble plain, pinyon and juniper woodland, and upper montane coniferous forests from approximately 5,200 to 28,000 feet above msl. It is endemic to the San Bernardino Mountains. This species was not observed during the 2002 botanical surveys. However, it has a moderate potential to occur on the project site given the presence of marginally suitable habitat within the pebble plain vegetation type.

Leafy Buckwheat (*Eriogonum foliosum*)

Leafy buckwheat is a CNPS List 1B species that typically blooms between July and October. This annual herb occurs in sandy soils of chaparral, lower montane coniferous forest, and pinyon and juniper woodland from approximately 3,900 to 7,200 feet above msl. It occurs in Riverside, San Bernardino, and San Diego counties. This species was not observed during the 2002 botanical surveys. However, it has a high potential to occur throughout the project site given the presence of suitable habitat.

Southern Mountain Buckwheat (*Eriogonum kennedyi* var. *austromontanum*)

Southern mountain buckwheat is a federally-listed Threatened and CNPS List 1B species that typically blooms between June and August. It is a mat-forming, woody perennial endemic to pebble plain habitats in Big Bear and Holcomb valleys in the San Bernardino Mountains from approximately 5,800 to 7,500 feet above msl. This species often serves as a host plant for the hemi-parasitic ash-gray Indian paintbrush and is also a food plant for the recently described, locally-endemic San Bernardino blue butterfly (*Euphilotes bernardino bernardino*). It is very similar to the more common Wright's matting buckwheat which is common on the project site. Several flowers and dried inflorescences of mat-forming buckwheats found throughout the project site were examined and identified as Wright's matting buckwheat. Southern mountain buckwheat was not seen during the 2002 botanical surveys and it has not been reported on the project site by other botanists (MBA 2000; CDFG 2001). However, it is considered to have a low potential to occur given that suitable habitat occurs within pebble plains on the project site.

Baldwin Lake Linanthus (*Linanthus killipii*)

Baldwin Lake linanthus is a CNPS List 1B species that typically blooms between May and July. It is an annual herb that occurs in alkaline meadows and seeps, pebble plain, pinyon and juniper woodland, and upper montane coniferous forest from approximately 5,500 to 7,900 feet above msl. It is endemic to the San Bernardino Mountains. This species was not observed during the 2002 botanical surveys. However, it is considered to have a high potential to occur on the project site given the presence of suitable habitat in the open Jeffrey pine and pebble plain vegetation types.

San Bernardino Mountain Monkeyflower (*Mimulus exiguus*)

San Bernardino Mountain monkeyflower is a CNPS List 1B species that typically blooms between June and July. This annual herb occurs in mesic clay soils of meadows and seeps, pebble plain, and upper montane coniferous forest from approximately 5,900 to 7,600 feet above msl. It occurs in the San Bernardino Mountains and in Baja California. This species was not observed during the 2002 botanical surveys. However, it is considered to have a high potential to occur on the project site given the presence of suitable habitat, particularly within the pebble plain vegetation type.

Bear Valley Phlox (*Phlox dolichantha*)

Bear Valley phlox is a CNPS List 1B species that typically blooms between May and July. This perennial herb occurs in pebble plain and open montane coniferous forest from approximately 6,000 to 9,750 feet above msl. It is endemic to the San Bernardino Mountains. This species was not observed during the 2002 botanical surveys. However, it is considered to have a high potential to occur on the project site given the presence of suitable habitat in the pebble plain and open Jeffrey pine forest vegetation types.

San Bernardino Bluegrass (*Poa atropurpurea*)

San Bernardino bluegrass is a federally-listed Endangered and CNPS List 1B species that typically blooms between May and June. This rhizomatous, perennial grass occurs in mesic meadows and seeps from approximately 4,400 to 8,100 feet above msl. It is known only from the San Bernardino Mountains and Laguna Mountains (San Diego County). Marginally suitable habitat for this species occurs along the lakeshore areas of the project site. This species was not observed during the 2002 botanical surveys. However, it is considered to have a low to moderate potential for occurrence on the project site given the presence of marginally suitable habitat.

Parish's Checkerbloom (*Sidalcea hickmanii* ssp. *parishii*)

Parish's checkerbloom is a CNPS List 1B and state-listed Rare species and Candidate for federal listing as Threatened or Endangered. It is a stout perennial herb that typically blooms between June and August. This species occurs in chaparral, woodlands, and forests from approximately 3,200 to 8,200 feet above msl and appears to germinate following fires. It is known from a few sites in the Santa Ana River Canyon of the San Bernardino Mountains, and in a few localities in Santa Barbara and San Luis Obispo counties. This species was not observed during the 2002 botanical surveys. However, it is considered to have a low potential to occur given the presence of suitable habitat and the project site's distance to known populations.

Bird's Foot Checkerbloom (*Sidalcea pedata*)

Bird's foot checkerbloom is a federally- and state-listed Endangered species and CNPS List 1B species that typically blooms between May and July. It occurs in meadows and seeps from approximately 5,200 to 8,100 feet above msl and is endemic to the San Bernardino Mountains.

Marginally suitable habitat occurs along the lakeshore. No bird's foot checkerbloom were encountered during the 2002 botanical surveys. However, it is considered to have a moderate potential to occur on the project site given the presence of suitable habitat.

Southern Jewelflower (*Streptanthus campestris*)

Southern jewelflower is a CNPS List 1B species that typically blooms between May and July. This perennial herb occurs in rocky soils of chaparral, lower montane coniferous forest, and pinyon and juniper woodland from approximately 2,950 to 7,550 feet above msl. It occurs in the Transverse and Peninsular mountain ranges of Riverside, San Bernardino, and San Diego counties. This species was not observed during the 2002 botanical surveys. However, it is considered to have a high potential to occur throughout the project site.

California Dandelion (*Taraxacum californicum*)

California dandelion is a federally-listed Endangered and CNPS List 1B species that typically blooms between May and July. It is a perennial herb endemic to the Big Bear Valley in the San Bernardino Mountains that occurs in meadows and seeps from approximately 6,300 to 7,800 feet above msl. This species was not observed during the 2002 botanical surveys. However, this species has a low to moderate potential to occur in marginally suitable habitat (degraded meadows) near the lakeshore.

Grey-Leaved Violet (*Viola pinetorum* ssp. *grisea*)

Grey-leaved violet is a CNPS List 1B species that typically blooms between April and July. It is a perennial herb occurring in meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest from approximately 4,900 to 11,200 feet above msl. This species is found in the Sierra Nevada Mountains in Fresno, Kern, and Tulare counties and in the San Bernardino Mountains. This species was not observed during the 2002 botanical surveys. However, it is considered to have a high potential to occur in mesic portions of Jeffrey pine forest within the project site.

SUMMARY

One special status vegetation type (pebble plain) and five special status plant species, including one federally-listed Threatened species (ash-gray Indian paintbrush), three CNPS List 1B species (Parish's rock cress, Bear Valley woollypod, and silver-haired ivesia), and one CNPS List 4 species (Heckard's paintbrush), were identified on the project site during the 2002 botanical surveys. Populations of ash-gray Indian paintbrush and Parish's rock cress were found to be widespread throughout an approximately 11.8 acre area of open Jeffrey pine forest with an herbaceous layer of Wright's matting buckwheat in the western half of the project site. The approximately 0.64 acre of pebble plain habitat was included in this area. Silver haired ivesia was found to be concentrated entirely within the mapped pebble plain habitat. Heckard's paintbrush and Bear Valley woollypod were found in patches scattered throughout Jeffrey pine forest habitat on the project site. It is expected that population sizes for these species on the project site would be considerably larger during a normal rainfall year (i.e., at least 40 percent of average annual rainfall). Surveys during a normal rainfall year would be required to determine the extent of these species on the project site.

There is potential for several special status botanical resources on the project site that were not detectable this spring due to the dry conditions. Botanical resources potentially occurring on the project site include one special status vegetation type (meadow), one federally- and state-listed Endangered and CNPS List 1B species (bird's foot checkerbloom), two federally-listed Endangered and CNPS List 1B species (San Bernardino bluegrass and California dandelion), two federally-listed

Threatened and CNPS List 1B species (Bear Valley sandwort and southern mountain buckwheat), one CNPS List 1B and state-listed Rare species and Candidate for federal listing as Threatened or Endangered (Parish's checkerbloom), and 10 CNPS List 1B species (Munz's mariposa lily, Palmer's mariposa lily, San Bernardino Mountain owl's clover, San Bernardino Mountains dudleya, leafy buckwheat, Baldwin Lake linanthus, San Bernardino Mountain monkeyflower, Bear Valley phlox, southern jewelflower, and grey-leaved violet). Surveys during a normal rainfall year would be required to determine presence or absence and the extent of these species on the project site.

Thank you for the opportunity to assist on this project. If you have any questions or comments, please contact either Ann Johnston or Sam Stewart at (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston /gms

Ann M. Johnston
Principal, Biological Services

Samuel C. Stewart IV
Assistant Project Manager/Ecologist

R:\Projects\RBF\J108\Plants-121702.DOC

Attachments: Exhibits 1, 2 and 3
Appendices A, B, and C

cc: Scott White

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APPENDIX A

Special status plants known to occur in the region excluded from consideration due to lack of suitable habitat or outside of range.

Common name	Latin name	Reason for exclusion
White-margined everlasting	Antennaria marginata	Outside geogr. range (only local occurrences in Barton Flats area)
San Bernardino rock-cress	Arabis breweri *var.* pecuniaria	Well below elev. range (occurs in San Gorgonio Wilderness)
Pinyon rock-cress	Arabis dispar	Outside geogr. range (only local occurrences on desert-facing slopes)
Shockley's rock-cress	Arabis shockleyi	Outside geogr. range (only local occurrences on desert-facing slopes)
Cushenbury milk-vetch	Astragalus albens	No suitable habitat (carbonate)
Parish's small-scale	Atriplex parishii	No suitable habitat (alkali sink)
Fremont barberry	Berberis fremontii	No local occurrences (presumed extinct in Cushenbury area)
Scalloped moonwort	Botrychium crenulatum	No suitable habitat (marshes, bogs)
Plummer's mariposa lily	Calochortus plummerae	Above elev. range (below ±5500 ft.)
San Jacinto Mts. daisy	Erigeron breweri jacinteus	Well below elev. range (occurs in San Gorgonio Wilderness)
Parish's daisy	Erigeron parishii	No suitable habitat (carbonate)
Limestone daisy	Erigeron uncialis	No San Bernardino Mountain occurrences (local reports erroneous)
Southern alpine buckwheat	Eriogonum kennedyi var. alpiginum	Well below elev. range (occurs in San Gorgonio Wilderness)
Cushenbury buckwheat	Eriogonum ovalifolium var. vineum	No suitable habitat (carbonate)
Hot springs fimbrystalis	Fimbrystalis thermalis	No suitable habitat (alkaline meadows, hot springs)
Moss gentian	Gentiana fremontii	Well below elev. range (occurs in San Gorgonio Wilderness)
Los Angeles sunflower	Helianthus nuttallii ssp. parishii	Well above elev. range (below about 4000 ft. elev.)
Barton Flats horkelia	Horkelia wilderae	Outside geogr. range (endemic to Barton Flats area)
Parry's hulsea	Hulsea vestita ssp. parryi	Outside geogr. range (only local occurrences on desert-facing slopes)
Pygmy hulsea	Hulsea vestita ssp. pygmaea	Well below elev. range (occurs in San Gorgonio Wilderness)
San Bernardino Mtn. bladderpod	Lesquerella kingii ssp. bernardinus	No habitat (carbonate)

APPENDIX A (Continued)

Special status plants known to occur in the region excluded from consideration due to lack of suitable habitat or outside of range.

Common name	Latin name	Reason for exclusion
Ocellated Humboldt lily	Lilium humboldtii var. ocellatum	Above elev. range (below about 5900 ft.)
Adder's mouth	Malaxis monophyllos ssp. brachypoda	Well below elev. range (occurs in San Gorgonio Wilderness)
Hall's monardella	Monardella macrantha hallii	Outside geogr. range (In San Bern. Mts., occurs only in southern part of range)
Cienega Seca oxythexca	*Oxytheca parishii* var. *cienegensis*	Outside geogr. range (known only from Cienega Seca area)
Cushenbury oxytheca	Oxytheca parishii var. goodmaniana	No habitat (carbonate)
Mountain oxytrope	Oxytropis oreophila	Well below elev. range (occurs in San Gorgonio Wilderness)
Frosted mint	Poliomintha incana	No suitable habitat (desert dunes and sandy flats)
Krukeberg's sword fern	Polystichum krukebergii	No San Bernardino Mountain occurrences (local reports unverified)
Narrow-leaved cottonwood	Populus angustifolia	No San Bernardino Mountain occurrences (local reports unverified)
Southern mountain skullcap	*Scutellaria bolanderi ssp. austromontanum*	No San Bernardino Mountain occurrences (local reports unverified)
Davidson's stonecrop	Sedum niveum	No suitable habitat (rock ledges & cliffs)
Slender-petaled thelypodium	Thelypodium stenopetalum	No habitat (alkaline meadows)

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APPENDIX B

Special status plants known to occur in the region with potential to occur on the project site.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Abronia nana* ssp. *covillei **Coville's dwarf abronia**	Carbonate and sandy soils within pinon-juniper woodlands; San Bernardino Mts. and mountains of E Mojave, ±5,200-9,200 ft.	May - August	Fed: none Calif: S3.2 CNPS: List 4 R-E-D:1-2-1	**Low** (marginally suitable habitat)
Allium parishii **Parish's onion**	Open shrublands & woodlands, gen. loose soil of bajada or mountain slopes, often carbonate soils, about 3,000 - 6,000 ft. elev.	Apr - May	Fed: none Calif: S3.3? CNPS: List 4 R-E-D:1-1-2	**Low** (suitable habitat, but above known elev. range)
Arabis parishii **Parish's rock cress**	Pebble plains; open dry sites in coniferous forest; about 5,800-9,500 ft. elev.; San Bernardino Mts. endemic	April - May	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-3	**Occurs**
Arenaria lanuginosa* ssp. *saxosa (*A. confusa*) **Rock sandwort**	Streamsides, sandy soils in meadows, about 5,900 to 9,000 ft. elev.; San Bernardino Mts. and mts. of N Baja Calif.	July - Aug	Fed: none Calif: S1.3 CNPS: 2 R-E-D:3-1-1	**Moderate** (moderately suitable habitat)
Arenaria ursina **Bear Valley sandwort**	Pebble plains, carbonate soils, about 6,400 - 6,900 ft. elev.; San Bernardino Mts. endemic	May - July	Fed: **THR** Calif: S2.1 CNPS: 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Astragalus bicristatus **Crested milk vetch**	Rocky slopes, montane coniferous forests; 5,500-8,200 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mts	May - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Astragalus lentiginosus* var. *sierrae **Big Bear Valley milk vetch**	Rocky meadows, pine woodlands, 5,800-8,500 ft. elev.; San Bernardino Mts. endemic	April - August	Fed: none Calif: S1? CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Astragalus leucolobus **Bear Valley woollypod**	Rocky soils, pine forests and sagebrush scrub, 5,700-8,750 ft. elev.; San Bernardino, San Gabriel, San Jacinto, and Sta Rosa Mts.	May - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Occurs**
Calochortus palmeri* vars. *palmeri* and *munzii **Palmer's & Munz's mariposa lilies**	Meadows and other sites where water available in spring, ±3,200-7,200 ft. elev.; S Coast Ranges, Transverse Ranges	May - June	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-3	**Moderate** (marginally suitable habitat)

APPENDIX B (Continued)

Special status plants known to occur in the region with potential to occur on the project site.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Castilleja cinerea **Ash-gray Indian paintbrush**	Pebble plains, dry meadows, about 5,900 to 9,300 ft. elev.; San Bernardino Mountains endemic	May - August	Fed: **THR** Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Occurs**
Castilleja lasiorhyncha **(syn. *Orthocarpus l.*) San Bernardino Mountain owl's clover**	Meadows, streamsides, seeps, other mesic sites, ±4,200-7,850 ft. elev.; S Calif. mtns.	June - August	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Castilleja applegateii **ssp. *martinii* × *C. angustifolia* (syn. *C. montigena, C. martinii* var. *ewanii*) Heckard's paintbrush**	Coniferous forest; San Bernardino Mountains endemic [Note: described as a species by Heckard *et al.* (1980), considered a hybrid by Chuang & Heckard *in* Hickman (ed., 1993)]	May - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Occurs** (Jeffrey pine forest)
Dryopteris filix-mas **Male fern**	Widespread in N hemisphere, esp. at high latitudes; only two widely separated locations in Calif., incl. one in Holcomb Valley	July - Sept.	Fed: none Calif: S1.3 CNPS: List 2 R-E-D:3-1-1	**Low** (local rarity)
Dudleya abramsii **ssp. *affinis* San Bernardino Mts. dudleya**	Pebble plains & rock outcrops (often on carbonate); pinyon woodland, open pine forests, 5,800-8,500 ft. elev.; San Bernardino Mts. endemic	May - June	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Moderate** (marginal habitat)
Eriogonum foliosum **Leafy buckwheat**	Sand; chaparral, lower montane forest, pinyon wdld., 3,900-7,200 ft. elev.; scattered locations, Big Bear Valley to N Baja Calif.	July - Oct.	Fed: none Calif: SH CNPS: 1B R-E-D:3-2-2	**High** (suitable habitat occurs)
Eriogonum kennedyi **var. *austromontanum* Southern mountain buckwheat**	Pebble plains and similar soils, about 5,800 - 7,500 ft. elev.; nearly endemic to Big Bear Valley area but also occurs at Mt. Pinos	June - August	Fed: **THR** Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Low** (field survey)
Eriophyllum lanatum **var. *obovatum* Southern Sierra woolly sunflower**	Open montane coniferous forests, 4,200-8,100 ft. elev.; S Sierra Nevada and western San Bernardino Mts.	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Low-moderate** (margin of geogr. range)
Galium jepsonii **(syn. *G. angustifolium* var. *subglabrum*) Jepson's bedstraw**	Sandy or gravelly soils, montane coniferous forest, 6,500-8,100 ft. elev.; San Gabriel and San Bernardino Mts	July - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)

APPENDIX B (Continued)

Special status plants known to occur in the region with potential to occur on the project site.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
***Galium johnstonii* (syn. *G. angustifolium* var. *pinetorum*)** **Johnston's bedstraw**	Dry rocky slopes, open mixed conifer forest, 5,300-7,500 ft. elev.; San Gabriel and San Bernardino Mts.	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Low-moderate** (suitable habitat occurs; margin of elev. range)
Gilia leptantha* ssp. *leptantha **San Bernardino Mtn. gilia**	Sandy or gravelly soils in open pine forest; endemic to upper Santa Ana Riv. watershed, San Bernardino Mts., about 5,000 to 7,700 ft. elev.	June - Aug	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	**Low** (probably outside geogr. range)
Heuchera hirsutissima **Shaggy-haired alum root**	Steep rocky slopes in montane forest above about 5,000 ft.; endemic to San Jacinto & Santa Rosa Mts (records from San Bernardino Mts. not confirmed)	May - July	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:3-1-3	**Low** (poorly suitable habitat)
Heuchera parishii **Parish's alumroot**	Rocky places, montane coniferous forests and alpine boulderfields, above 4,800 ft. elev.; San Bernardino Mts endemic	June - July	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-3	**Low** (poorly suitable habitat)
Ivesia argyrocoma **Silver-haired ivesia**	Pebble plains, dry or seasonally moist meadows and drainages; about 4,900-8,800 ft. elev.; San Bernardino Mts and a long-disjunct site in Baja Calif mts	June - August	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-2	**Occurs**
Juncus duranii **Duran's rush**	Meadows or other wet places, montane coniferous forest, 5,800-9,000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mts	July - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Moderate** (suitable habitat occurs)
Lewisia brachycalyx **Short-sepaled lewisia**	Wet meadows, forest openings, 4,500-7,500 ft. elev.; San Bernardino Mts to Baja Calif, Utah, New Mex.	May - June	Fed: none Calif: S3.2 CNPS: List 2 R-E-D:2-2-1	**Low-Moderate** (marginal habitat)
Lilium parryi **Lemon lily**	Meadows and streambanks above about 4,000 ft. elev.; mts. of S Calif. and SE Arizona	July - August	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-2	**Low** (marginal habitat)
Linanthus killipii **Baldwin Lake linanthus**	Pebble plains, alkaline meadows, forest openings, 5,500-7,900 ft. elev.; San Bernardino Mts endemic	May - July	Fed: none Calif: S2.1 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)

APPENDIX B (Continued)

Special status plants known to occur in the region with potential to occur on the project site.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Mimulus exiguus **San Bernardino Mountain monkeyflower**	Meadows, seeps, drainages, 5,900-7,600 ft. elev.; San Bernardino Mts and high mts of Baja Calif.	June - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-2	**High** (suitable habitat occurs)
Mimulus purpureus* var. *purpureus **Purple monkeyflower**	Meadow edges, forests, drainages, seeps, 6,100-7,600 ft. elev.; San Bernardino Mts and high mts of Baja Calif.	May - July	Fed: none Calif: S2.2 CNPS: List 2 R-E-D:2-2-2	**High** (suitable habitat occurs)
Navarretia peninsularis **Baja navarretia**	Open, seasonally wet places in coniferous forests, 4,900-7,550 ft. elev.; mts of central and S Calif. and N Baja Calif.	June - August	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-2	**Low** (small patches of marginal habitat)
Oxytheca caryophylloides **Chickweed oxytheca**	Sandy soils in conifer forests, 3,900-8,500 ft. elev.; S Sierra Nevada, Transverse Ranges, San Jacinto Mts.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Perideridia parishii* ssp. *parishii **Parish's yampah**	Meadows, moist areas in coniferous forest above about 6,500 ft. elev.; San Bernardino Mountains and (disjunct) Arizona and New Mex.	June - August	Fed: none Calif: S2.2? CNPS: List 2 R-E-D:2-2-1	**High** (suitable habitat occurs)
Phacelia exilis **(syn. *P. mohavensis* var. *exilis*)** **Transverse Range phacelia**	Sandy or gravelly soils, forest openings, meadows, pebble plains, 3,500-8800 ft. elev.; S Sierra Nevada and Transverse Ranges	May - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Phacelia mohavensis **Mojave phacelia**	Sandy or gravelly soils, woodlands, conifer forests, dry meadows and streambeds, 4,500-8,100 ft. elev.; San Gabriel & San Bernardino Mts	April - August	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)
Phlox dolichantha **Bear Valley phlox**	Montane coniferous forest; 6,500- 8,800 ft. elev.; San Bernardino Mts endemic	June - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**High** (suitable habitat occurs)
Poa atropurpurea **San Bernardino bluegrass**	Open, flat meadows, 4,400-8,100 ft. elev.; San Bernardino Mts and Laguna Mts (San Diego Co.)	May - June	Fed: **END** Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Low - moderate** (marginally suitable habitat occurs)

APPENDIX B (Continued)

Special status plants known to occur in the region with potential to occur on the project site.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Pyrrocoma uniflora* ssp. *gossypina (*Haplopappus uniflorus* ssp. *gossypinus*) **Bear Valley pyrrocoma**	Meadows (usually alkaline), pebble plains, about 5,200 - 7,600 ft. elev.; San Bernardino Mts endemic	July - August	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Low - moderate** (marginally suitable habitat occurs)
Rupertia rigida **(syn. *Psoralea rigida*) Parish's rupertia**	Chaparral, forests, and woodlands, below ±8,100 ft. elev.; San Bernardino Mts, Peninsular Ranges, Baja Calif.	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-2	**High** (suitable habitat occurs)
Selaginella asprella **Bluish spike-moss**	Rocks, crevices, & rocky soils, dry sites in coniferous forests, 5,200-8,800 ft. elev.; scattered mtn. ranges of cent. & S Calif., Baja Calif.	July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-2	**Low** (marginal habitat)
Senecio bernardinus **San Bernardino butterweed**	Dry meadows (sometimes alkaline), 5,800-7,500 ft. elev.; San Bernardino Mts endemic	May - July	Fed: none Calif: S2.2 CNPS: List 1B R-E-D:2-2-3	**Low** (marginally suitable habitat)
Senecio ionophyllus **Tehachapi ragwort**	Crevices, rocky places in dry coniferous forest, 4,800-8,900 ft. elev.; S Sierra Nevada, San Gabriel and San Bernardino Mts	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**Low** (marginally suitable habitat)
Sidalcea hickmanii* ssp. *parishii **Parish's checkerbloom**	Chaparral, oak shrublands, pine forests; San Bernardino Mts and a few Santa Barbara Co sites, about 3,200-8,200 ft. elev.	June - August	Fed: Candidate Calif: **Rare**, 1.2 CNPS: List 1B R-E-D:3-2-3	**Low** (marginally suitable habitat)
Sidalcea pedata **Bird's foot checkerbloom**	Meadows (freshwater or alkaline clay), sometimes streambanks, 5,200-8,100 ft. elev.; San Bernardino Mts endemic	May - July	Fed: **END** Calif: **END**, 1.1 CNPS: List 1B R-E-D:3-3-3	**Low - moderate** (suitable habitat occurs)
Sphenopholis obtusata **Prairie wedge grass**	Riparian woodlands, wet meadows, streambanks; a few widely scattered locations in Calif. but widespread in North America	April - July	Fed: none Calif: S2.2 CNPS: List 2 R-E-D:2-2-1	**High** (suitable habitat occurs)
Streptanthus bernardinus **Laguna Mountains jewelflower**	Chaparral, hardwood forests, coniferous forest, about 3,900-8,100 ft. elev.; mts. of S Calif. (San Bern. Mtn. records much farther west)	June - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-3	**High** (suitable habitat occurs)

APPENDIX B (Continued)

Special status plants known to occur in the region with potential to occur on the project site.

Special Status Plants	Habitat and Distribution	Flower season	Status Designation	Occurrence Probability
Streptanthus campestris **Southern jewelflower**	Rocky sites, chaparral, coniferous forest, pinyon woodland, 2,950-7,550 ft. elev.; Transverse and Peninsular Ranges, Baja Calif.	May - July	Fed: none Calif: S2.3 CNPS: List 1B R-E-D:2-1-2	**High** (suitable habitat occurs)
Swertia neglecta **(syn. Frasera neglecta) Pine green-gentian**	Coniferous forests and pinyon wooodland., 4,500-8,100 ft. elev.; S Coastal Ranges and Transverse Ranges	May - July	Fed: none Calif: S3.3 CNPS: List 4 R-E-D: 1-1-3	**High** (suitable habitat occurs)
Taraxacum californicum **California dandelion**	Wet meadows, 6,300-7,800 ft. elev.; San Bernardino Mts endemic	May - July	Fed: **END** Calif: S2.1 CNPS: List 1B R-E-D: 3-2-3	**Low - moderate** (suitable habitat occurs)
Thelypodium stenopetalum **Slender-petaled thelypodium**	Meadows (mesic, alkaline clay), about 6,200 - 7,200 ft. elev.; San Bernardino Mts endemic to Big Bear and Holcomb Valleys	June - July	Fed: **END** Calif: **END**, 1.1 CNPS: List 1B R-E-D:3-3-3	**Absent** (no alkaline meadow habitat)
Trichostema micranthum **Small-flowered bluecurls**	Dry margins of lakes, meadows, and streams, 6,500-7,500 ft. elev., San Bernardino Mts and Baja Calif.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4 R-E-D:1-1-1	**High** (suitable habitat occurs)
Viola pinetorum **ssp. *grisea*** **Grey-leaved violet**	Conifer forests, about 4,800-11,100 ft. elev.; S Sierra Nevada and possibly San Bernardinos (unconfirmed reports)	April - July	Fed: none Calif: S1.3 CNPS: List 1B R-E-D:3-1-3	**High** (suitable habitat occurs)

General references: CDFG 2001, CNPS 2001, Rarefind 2000, Hickman (ed.) 1993, Munz 1974, Sanders et al. 1995, Tibor 2001, US Fish and Wildlife Service 1999.

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APPENDIX B (Continued)

Special status plants known to occur in the region with potential to occur on the project site.

Federal designations: (federal Endangered Species Act, US Fish and Wildlife Service). Note that some agencies, but not FWS, continue to use "SOC" as a federal status designation. Until 1996, FWS maintained a list of "category 2 candidates," described as species of concern, but for which insufficient data were available to support listing. This list is no longer maintained and FWS has no "SOC" category.

END: Federally listed, endangered.

THR: Federally listed, threatened.

Candidate: Sufficient data are available to support federal listing, but not listed at this time.

Proposed: Formally proposed for federal status shown.

State designations: (California Endangered Species Act, California Dept. of Fish and Game)

END: State listed, endangered.

THR: State listed, threatened.

RARE: State listed as rare (Listed "rare" animals have been re-designated as threatened, but rare plants have retained the rare designation.)

CDF&G Natural Diversity Data Base Designations: Applied to special status plants and sensitive plant communities; where correct category is uncertain, CDF&G uses two categories or question marks.

S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.

S1.1: Very threatened

S1.2: Threatened

S1.3: No current threats known

S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above).

S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimel suffixes same as above).

S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.

S5: Demonstrably secure or ineradicable in California. No threat rank.

California Native Plant Society (CNPS) designations. Note: CNPS (Tibor, ed., 2001 p. 54-55) asserts that plants on Lists 1A, 1B, and 2 meet definitions as threatened or endangered and "are eligible" for state listing.

List 1A: Plants presumed extinct in California.

List IB: Plants rare and endangered in California and throughout their range.

List 2: Plants rare, threatened or endangered in California but more common elsewhere in their range.

List 3: Plants about which we need more information; a review list.

List 4: Plants of limited distribution; a watch list.

CNPS R-E-D Code:

Rarity I: Rare, but sufficient numbers and distribution that the potential for extinction is presently low.

2: Occurrence confined to several populations or one extended population.

3: Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.

Endangerment 1: Not endangered.

2: Endangered in a portion of its range.

3: Endangered throughout its range.

Distribution 1: More or less widespread outside California.

2: Rare outside California.

3: Endemic to California (i.e., does not occur outside California).

Definitions of occurrence probability:

Occurs: Observed on the site by qualified biologists.

High: Observed in similar habitat in region by qualified biologists, or habitat on the site is a type often utilized by the species and the site is within the known range of the species.

Moderate: Reported sightings in surrounding region, or site is within the known range of the species and habitat on the site is a type occasionally used by the species.

Low: Site is within the known range of the species but habitat on the site is rarely used by the species.

Absent: A focused study failed to detect the species, or, no suitable habitat is present.

Unknown: No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

APPENDIX C: SPECIES LIST

	Latin Name	**Common Name**
	CUPRESSACEAE	CYPRESS FAMILY
	Calocedrus decurrens	Incense cedar
	Juniperus occidentalis	Western juniper
	PINACEAE	PINE FAMILY
	Abies concolor	White fir
	Pinus jeffreyi	Jeffrey pine
	Pinus monophylla	Pinyon pine
	APIACEAE	CELERY FAMILY
	Lomatium nevadense	Nevada lomatium
	Tauschia parishii	Parish tauschia
	ASTERACEAE	ASTER FAMILY
	Achillia millefolium	California yarrow
	Agoseris retrorsa	Spear-leaved agoseris
	Antennaria dimorpha	Low everlasting
	Artemisia dracunculus	Tarragon
	Artemisia ludoviciana	Western mugwort
	Artemisia tridentata	Great Basin sagebrush
	Aster frondosus	Short-rayed alkali aster
	Chrysothamnus nauseosus	Common rabbitbrush
	Chrysothamnus viscidiflorus	Curlleaf rabbitbrush
	Cirsium occidentale var. californicum	California thistle
*	*Cirsium vulgare*	Bull thistle
	Erigeron breweri	Brewer's daisy
	Eriophyllum confertiflorum	Golden yarrow
	Gnaphalium canescens	Perennial cudweed
*	*Gnaphalium luteo-album*	Pearly everlasting
	Hymenopappus filifolius	Columbia cutleaf
*	*Lactuca serriola*	Prickly lettuce
	Lessingia filaginifolia (Corethrogyne filaginifolia)	Chaparral aster
	Madia elegans	Elegant tarplant
*	*Senecio vulgaris*	Common groundsel
	Solidago californica	Calif. goldenrod
*	*Sonchus oleraceus*	Common sow thistle
*	*Taraxacum officinale*	Common dandelion
	Tetradymia comosa	Hairy horsebrush
*	*Tragopogon dubius*	Oyster plant, salsify
	BORAGINACEAE	BORAGE FAMILY
	Cryptantha micrantha	Purple root cryptantha
	BRASSICACEAE	MUSTARD FAMILY
	Arabis holboellii (?)	Holboell's rock-cress
	Descurainia pinnata	Tansy mustard
	Erysiumum capitatum	Douglas wallflower
*	*Lepidium virginicum v. pubescens*	Wild peppergrass
*	*Sisymbrium altissimum*	Tumble mustard

Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes o species observed on the site. Others may have been overlooked or unidentifiable due to season. Plants were identified using keys, descriptions, and illustrations in Abrams (1923-1951), Hickman (1993), and Munz (1974). Taxonomy and nomenclature generally follow Hickman.

APPENDIX C: SPECIES LIST

CACTACEAE	CACTUS FAMILY
Opuntia basilaris var. basilaris	Common beavertail cactus
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY
Symphoricarpos rotundifolius var. parishii	Parish snowberry
CARYOPHYLLACEAE	CARNATION FAMILY
Silene verecunda ssp. platyota	Cuyamaca campion
CHENOPODIACEAE	GOOSEFOOT FAMILY
* *Chenopodium album (?)*	Common goosefoot
* *Salsola tragus*	Russian thistle, tumbleweed
CONVOLVULACEAE	MORNING GLORY FAMILY
Calystegia malacophylla ssp. fulcrata (C. fulcrata)	Morning glory
ERICACEAE	MANZANITA FAMILY
Arctostaphylos patula	Greenleaf manzanita
EUPHORBIACEAE	SPURGE FAMILY
Chamaesyce albomarginata	Rattlesnake spurge
Euphorbia palmeri	Wood spurge
FABACEAE	PEA FAMILY
Amorpha californica	Calif. false indigo
** *Astragalus leucolobus (?)*	Bear Valley woollypod - WL
Astragalus purshii var. tinctus (?)	Pursh's woollypod
Lotus argyraeus	Silver lotus
Lotus nevadensis	Nevada lotus
Lupinus cf. breweri	Silver mat lupine
Lupinus excubitus var. austromontanus (?)	Southern mountain lupine
Lupinus lepidus v. confertus (Lupinus confertus)	Prairie lupine
* *Medicago lupulina*	Black medick
* *Melilotus alba*	White sweet-clover
FAGACEAE	OAK FAMILY
Quercus kelloggii	California black oak
GERANIACEAE	GERANIUM FAMILY
* *Erodium cicutarium*	Red-stemmed filaree
HYDROPHYLLACEAE	WATERLEAF FAMILY
Eridictyon trichocalyx	Yerba santa
Phacelia distans (?)	Common phacelia
Phacelia imbricata	Broad-sepaled phacelia
LAMIACEAE	MINT FAMILY
Monardella linoides (?) (or M. odoratissima)	Flax-leaved monardella
Scutellaria siphocampyloides (S. austinae)	Austin's skullcap
LOASACEAE	STICK-LEAF FAMILY
Mentzelia sp.	Unid. stick-leaf
MALVACEAE	MALLOW FAMILY
* *Malva parviflora*	Cheeseweed
ONAGRACEAE	EVENING PRIMROSE FAMILY
Epilobium brachycarpum (E. paniculatum)	Summer cottonweed
Epilobium ciliatum	Willow-herb

APPENDIX C: SPECIES LIST

POLEMONIACEAE		PHLOX FAMILY
	Eriastrum densifolium ssp. densifolium	Mojave woolly-star
	Eriastrum sapphirinum (?)	Sapphire woollystar
	Linanthus breviculus	Mojave linanthus
	Phlox gracilis	Slender phlox
POLYGONACEAE		BUCKWHEAT FAMILY
	Eriogonum davidsonii (=E. molestum var. davidsonii)	Davidson buckwheat
	Eriogonum wrightii ssp. subscaposum	Wright's buckwheat
	Eriogonum umbellatum v. munzii	Munz sulfur buckwheat
*	*Polygonum arenastrum*	Common knotweed
*	*Rumex crispus*	Curly dock
	Rumex salicifolius	Willow dock
PORTULACACEAE		PURSLANE FAMILY
	Lewisia rediviva	Bitter root
RANUNCULACEAE		BUTTERCUP FAMILY
	Delphinium sp.	Unid. larkspur
*	*Ranunculus sceleratus*	Cursed buttercup
RHAMNACEAE		BUCKTHORN FAMILY
	Ceanothus cordulatus	Mountain whitethorn
	Ceanothus greggii	Cupleaf ceanothus
	Ceanothus integerrimus	Deerbrush
ROSACEAE		ROSE FAMILY
	Amelanchier utahensis (incl. A. pallida)	Service berry
	Cercocarpus betuloides	Birch-leaf mountain mahogany
	Cercocarpus ledifolius	Curlleaf mountain mahogany
	Horkelia rydbergii (H. bolanderi s. parryi)	Transverse range horkelia
**	*Ivesia argyrocoma*	Silver-haired ivesia
	Potentilla anserina	Silverweed
	Potentilla biennis	Biennial cinquefoil
	Potentilla gracilis	Slender cinquefoil
RUBIACEAE		COFFEE FAMILY
	Galium sp.	Unid. bedstraw
SALICACEAE		WILLOW FAMILY
	Populus balsamifera trichocarpa	Black cottonwood
	Salix laevigata (?)	Red willow
	Salix lasiolepis (?)	Arroyo willow
SCROPHULARIACEAE		SNAPDRAGON FAMILY
**	*Castilleja cinera*	Ash-gray paintbrush
**	*Castilleja montigena*	Heckard's paintbrush
	Collinsis parviflora (?)	Small-flowered blue-eyed Mary
	Penstemon eatonii	Eaton firecracker
*	*Verbascum thapsus*	Common muellin
STERCULIACEAE		CACAO FAMILY
	Fremontodendron californicum	Flannel bush
TAMARICACEAE		TAMARISK FAMILY
	Tamarix ramosissima	Mediterranean tamarisk

APPENDIX C: SPECIES LIST

	VIOLACEAE	VIOLET FAMILY
	Viola douglasii	Douglas violet
	Viola pinetorum ssp. pinetorum or V. purpurea	Mountain violet
	CYPERACEAE	SEDGE FAMILY
	Carex athrostachya	Slender-beaked sedge
	JUNCACEAE	RUSH FAMILY
	Juncus mexicanus (incl. J. balticus)	Wire-grass
	LILIACEAE	LILY FAMILY
	Allium parryi	Parry's onion
	Calochortus kennedyi	Kennedy's mariposa lily
	POACEAE	GRASS FAMILY
	Agrostis sp.	Unid. bentgrass
	Alopecurus aequalis	Short-awn foxtail
	Bromus carinatus	California brome
*	*Bromus tectorum*	Cheat grass
	Elymus elymoides (Sitanion hystrix v. hystrix)	Bottlebrush squirreltail
	Hordeum jubatum	Foxtail barley
*	*Koeleria macrantha*	Junegrass
	Melica stricta	Nodding melic
	Muhlenbergia rigens	Deergrass
	Poa fendleriana	Fendler bluegrass
	Poa secunda	Nodding bluegrass
*	*Polypogon monspeliensis*	Rabbitfoot grass
	Pucinellia nuttalliana	Alkali grass
	Stipa coronata ssp. depauperata (Achnatherum parishii)	Parish needlegrass
	Stipa lettermannii	Letterman's needlegrass
	Vulpia microstachys (Festuca microstachys, F. reflexa, F. pacifica, F. confusa)	Annual fescue

APPENDIX C: SPECIES LIST

terisks. This list includes only
able due to season. Plants
51), Hickman (1993), and

VERTEBRATE ANIMALS		
AMPHIBIA		AMPHIBIANS
SALAMANDRIDAE		NEWTS
	Taricha torosa	California newt
PLETHODONTIDAE		LUNGLESS SALAMANDERS
	Ensatina eschscholtzii	Ensatina
	Aneides lugubris	Arboreal salamander
	Batrachoseps pacificus	Pacific slender salamander
PELOBATIDAE		SPADEFOOT TOADS
**	*Scaphiopus hammondii*	Western spadefoot
BUFONIDAE		TRUE TOADS
	Bufo boreas	Western toad
	Bufo woodhousei	Woodhouse toad
**	*Bufo microscaphus*	Southwestern toad
	Bufo punctatus	Red-spotted toad
HYLIDAE		TREEFROGS
	Hyla cadaverina	California treefrog
	Hyla regilla	Pacific treefrog
RANIDAE		TRUE FROGS
**	*Rana aurora*	Red-legged frog
**	*Rana pipiens*	Northern leopard frog
*	*Rana catesbeiana*	Bullfrog
REPTILIA		REPTILES
EMYDIDAE		BOX AND WATER TURTLES
**	*Clemmys marmorata*	Western pond turtle
TESTUDINIDAE		LAND TORTOISES
**	*Gopherus agassizii* (*Xerobates agassizi*)	Desert tortoise
TRIONYCHIDAE		SOFTSHELL TURTLES
	Trionyx spiniferus	Spiny softshell
GEKKONIDAE		GECKOS
	Coleonyx variegatus	Western banded gecko
**	*Coleonyx swaitaki*	Barefoot gecko
	Phyllodactylus xanti	Leaf-toed gecko
IGUANIDAE		IGUANID LIZARDS
	Dipsosaurus dorsalis	Desert iguana
	Sauromalus obesus	Common chuckwalla
	Callisaurus draconoides	Zebra-tailed lizard
**	*Uma notata ssp. notata*	Colorado desert fringe-toed lizard
**	*Uma inornata*	Coachella valley fringe-toed lizard
**	*Uma scoparia*	Mojave fringe-toed lizard
	Crotaphytus insularis	Desert collared lizard
	Gambelia wislizenii	Long-nosed leopard lizard
	Sceloporus magister	Desert spiny lizard
	Sceloporus orcutti	Granite spiny lizard
	Sceloporus occidentalis	Western fence lizard
	Sceloporus grasiosus	Sagebrush lizard
	Uta stansburiana	Side-blotched lizard
	Urosaurus graciosus	Long-tailed brush lizard
	Petrosaurus mearnsi	Banded rock lizard

**	*Phrynosoma coronatum ssp. blainvillei*	San Diego horned lizard
	Phrynosoma platyrhinos	Desert horned lizard
**	*Phrynosoma mcallii*	Flat-tailed horned lizard
	XANTUSIIDAE	NIGHT LIZARDS
	Xantusia henshawi	Granite night lizard
	Xantusia vigilis	Desert night lizard
	SCINCIDAE	SKINKS
	Eumeces skiltonianus	Western skink
	Eumeces gilberti	Gilbert skink
	TEIIDAE	WHIPTAILS
**	*Cnemidophorus hyperythrus*	Orange-throated whiptail
**	*Cnemidophorus tigris*	Western whiptail
	ANGUIDAE	ALLIGATOR LIZARDS
	Gerrhonotus multicarinatus	Southern alligator lizard
	ANNIELLIDAE	LEGLESS LIZARDS
**	*Aniella pulchra ssp. pulchra*	Silvery legless lizard
	LEPTOTYPHLOPIDAE	SLENDER BLIND SNAKES
	Leptotyphlops humilis	Western blind snake
	BOIDAE	BOAS AND PYTHONS
**	*Charina bottae ssp. umbratica*	Southern rubber boa
	Lichanura trivirgata	Rosy boa
	COLUBRIDAE	COLUBRIDS
**	*Diadophis punctatus*	Ringneck snake
	Phyllorhynchus decurtatus	Spotted leaf-nosed snake
	Coluber constrictor	Racer
	Masticophis flagellum	Coachwhip
	Masticophis lateralis	California whipsnake
**	*Salvadora hexalepis*	Western patch-nosed snake
	Arizona elegans	Glossy snake
	Pituophis melanoleucus	Gopher snake
	Lampropeltis getulus	Common kingsnake
**	*Lampropeltis zonata ssp. pulchra*	San Bernardino Mountain kingsnake
	Rhinocheilus lecontei	Long-nosed snake
	Thamnophis sirtalis	Common garter snake
	Thamnophis elegans	Western terrestrial garter snake
**	*Thamnophis hammondii*	Two-striped garter snake
	VIPERIDAE	VIPERS
	Crotalus atrox	Western diamondback rattlesnake
**	*Crotalus ruber*	Red diamond rattlesnake
	Crotalus mitchellii	Speckled rattlesnake
	Crotalus cerastes	Sidewinder
	Crotalus viridis	Western rattlesnake
	Crotalus scutulatus	Mojave rattlesnake
	AVES	BIRDS
	GAVIIDAE	LOONS
	Gavia immer	Common loon
	PODICIPEDIDAE	GREBES
	Podilymbus podiceps	Pied-billed grebe
	Podiceps nigricollis	Eared grebe
	Aechmophorus occidentalis	Western grebe
	Aechmophorus clarkii	Clark's grebe

PELECANIDAE		PELICANS
	Pelecanus erythrorhynchos	American white pelican
**	*Pelecanus occidentalis*	Brown pelican
PHALACROCORACIDAE		CORMORANTS
	Phalacrocorax auritus	Double-crested cormorant
ARDEIDAE		HERONS
	Botaurus lentiginosus	American bittern
	Ardea herodias	Great blue heron
	Casmerodius albus	Great egret
	Egretta thula	Snowy egret
	Bubulcus ibis	Cattle egret
	Butorides striatus	Green-backed heron
**	*Nycticorax nycticorax*	Black-crowned night heron
THRESKIORNITHIDAE		IBISES AND SPOONBILLS
**	*Plegadis chihi*	White-faced ibis
ANATIDAE		DUCKS, GEESE AND SWANS
	Anser albifrons	Greater white-fronted goose
	Chen caerulescens	Snow goose
	Chen rossii	Ross' goose
	Branta canadensis	Canada goose
	Anas crecca	Green-winged teal
	Anas platyrhynchos	Mallard
	Anas acuta	Northern pintail
	Anas discors	Blue-winged teal
	Anas cyanoptera	Cinnamon teal
	Anas clypeata	Northern shoveler
	Anas strepera	Gadwall
	Anas americana	American wigeon
	Aythya valisineria	Canvasback
	Aythya americana	Redhead
	Aythya collaris	Ring-necked duck
	Aythya affinis	Lesser scaup
	Bucephala clangula	Common goldeneye
	Bucephala albeola	Bufflehead
	Mergus merganser	Common merganser
	Mergus serrator	Red-breasted merganser
	Oxyura jamaicensis	Ruddy duck
RALLIDAE		RAILS, GALLINULES, COOTS
	Rallus longirostris	Clapper rail
	Rallus limicola	Virginia rail
	Porzana carolina	Sora
	Gallinula chloropus	Common moorhen
	Fulica americana	American coot
CATHARTIDAE		VULTURES
	Cathartes aura	Turkey vulture
ACCIPITRIDAE		HAWKS, EAGLES, HARRIERS
**	*Pandion haliaetus*	Osprey
**	*Elanus caeruleus*	Black-shouldered kite
**	*Aquila chrysaetos*	Golden eagle
**	*Haliaeetus leucocephalus*	Bald eagle
**	*Circus cyaneus*	Northern harrier
**	*Accipiter striatus*	Sharp-shinned hawk
**	*Accipiter cooperii*	Cooper's hawk

	Buteo lineatus	Red-shouldered hawk
**	*Buteo swainsoni*	Swainson's hawk
	Buteo jamaicensis	Red-tailed hawk
**	*Buteo regalis*	Ferruginous hawk
	Buteo lagopus	Rough-legged hawk
FALCONIDAE		FALCONS
	Falco sparverius	American kestrel
**	*Falco columbarius*	Merlin
**	*Falco peregrinus*	Peregrine falcon
**	*Falco mexicanus*	Prairie falcon
PHASIANIDAE		GROUSE AND QUAIL
	Alectoris chukar	Chukar
	Phasianus colchicus	Ring-necked pheasant
	Callipepla gambelii	Gambel's quail
	Callipepla californica	California quail
	Oreortyx pictus	Mountain quail
CHARADRIIDAE		PLOVERS
	Pluvialis squatarola	Black-bellied plover
**	*Charadrius alexandrinus*	Snowy plover
	Charadrius semipalmatus	Semipalmated plover
	Charadrius vociferus	Killdeer
**	*Charadrius montanus*	Mountain plover
RECURVIROSTRIDAE		STILTS AND AVOCETS
	Himantopus mexicanus	Black-necked stilt
	Recurvirostra americana	American avocet
SCOLOPACIDAE		SANDPIPERS
	Tringa melanoleuca	Greater yellowlegs
	Tringa flavipes	Lesser yellowlegs
	Catoptrophorus semipalmatus	Willet
	Actitis macularia	Spotted sandpiper
	Numenius phaeopus	Whimbrel
	Numenius americanus	Long-billed curlew
	Limosa fedoa	Marbled godwit
	Arenaria interpres	Ruddy turnstone
	Arenaria melanocephala	Black turnstone
	Calidris canutus	Red knot
	Calidris alba	Sanderling
	Calidris pusilla	Semipalmated sandpiper
	Calidris mauri	Western sandpiper
	Calidris minutilla	Least sandpiper
	Calidris alpina	Dunlin
	Limnodromus griseus	Short-billed dowitcher
	Limnodromus scolopaceus	Long-billed dowitcher
	Gallinago gallinago	Common snipe
	Phalaropus tricolor	Wilson's phalarope
	Phalaropus lobatus	Red-necked phalarope
LARIDAE		GULLS AND TERNS
	Larus philadelphia	Bonaparte's gull
	Larus delawarensis	Ring-billed gull
	Larus californicus	California gull
	Larus argentatus	Herring gull
	Larus occidentalis	Western gull
	Sterna caspia	Caspian tern

	Sterna hirundo	Common tern
	Sterna forsteri	Forster's tern
	COLUMBIDAE	PIGEONS AND DOVES
	Columba livia	Rock dove
	Columba fasciata	Band-tailed pigeon
*	*Streptopelia chinensis*	Spotted dove
	Zenaida asiatica	White-winged dove
	Zenaida macroura	Mourning dove
	Columbina passerina	Common ground-dove
	CUCULIDAE	CUCKOOS
	Geococcyx californianus	Greater roadrunner
	TYTONIDAE	BARN OWLS
	Tyto alba	Common barn-owl
	STRIGIDAE	TYPICAL OWLS
	Otus kennicottii	Western screech-owl
	Bubo virginianus	Great horned owl
**	*Speotyto cunicularia*	Burrowing owl
**	*Asio otus*	Long-eared owl
	CAMPRIMULGIDAE	NIGHTJARS
	Chordeiles acutipennis	Lesser nighthawk
	Chordeiles minor	Common nighthawk
	Phalaenoptilus nuttallii	Common poorwill
	APODIDAE	SWIFTS
	Chaetura vauxi	Vaux's swift
	Aeronautes saxatalis	White-throated swift
	TROCHILIDAE	HUMMINGBIRDS
	Archilochus alexandri	Black-chinned hummingbird
	Calypte anna	Anna's hummingbird
	Calypte costae	Costa's hummingbird
	Selasphorus rufus	Rufous hummingbird
	Selasphorus sasin	Allen's hummingbird
	ALCEDINIDAE	KINGFISHERS
	Ceryle alcyon	Belted kingfisher
	PICIDAE	WOODPECKERS
	Melanerpes formicivorus	Acorn woodpecker
	Melanerpes lewis	Lewis' woodpecker
	Sphyrapicus nuchalis	Red-naped sapsucker
	Sphyrapicus thyroideus	Williamson's sapsucker
	Picoides scalaris	Ladder-backed woodpecker
	Picoides nuttallii	Nuttall's woodpecker
	Picoides pubescens	Downy woodpecker
	Picoides villosus	Hairy woodpecker
	Picoides albolarvatus	White-headed woodpecker
	Colaptes auratus	Northern flicker
	TYRANNIDAE	TYRANT FLYCATCHERS
	Contopus borealis	Olive-sided flycatcher
	Contopus sordidulus	Western wood-pewee
	Empidonax traillii	Willow flycatcher
	Empidonax hammondii	Hammond's flycatcher
	Empidonax oberholseri	Dusky flycatcher
	Empidonax wrightii	Gray flycatcher
	Empidonax difficilis	Western flycatcher
	Sayornis nigricans	Black phoebe

	Sayornis saya	Say's phoebe
	Myiarchus cinerascens	Ash-throated flycatcher
	Tyrannus vociferans	Cassin's kingbird
	Tyrannus verticalis	Western kingbird
ALAUDIDAE		LARKS
	Eremophila alpestris	Horned lark
HIRUNDINIDAE		SWALLOWS
	Tachycineta bicolor	Tree swallow
	Tachycineta thalassina	Violet-green swallow
	Stelgidopteryx serripennis	Northern rough-winged swallow
	Hirundo pyrrhonota	Cliff swallow
	Hirundo rustica	Barn swallow
CORVIDAE		CROWS AND JAYS
	Cyanocitta stellari	Stellar's jay
	Aphelocoma coerulescens	Scrub jay
	Gymnorhinus cyanocephalus	Pinyon jay
	Nucifraga columbiana	Clark's nutcracker
	Corvus brachyrhynchos	American crow
	Corvus corax	Common raven
PARIDAE		CHICKADEES AND TITMICE
	Parus gambeli	Mountain chickadee
	Parus inornatus	Plain titmouse
REMIZIDAE		VERDINS
	Auriparus flavipes	Verdin
AEGITHALIDAE		BUSHTITS
	Psaltriparus minimus	Bushtit
SITTIDAE		NUTHATCHES
	Sitta canadensis	Red-breasted nuthatch
	Sitta carolinensis	White-breasted nuthatch
	Sitta pygmaea	Pygmy nuthatch
CERTHIIDAE		CREEPERS
	Certhia americana	Brown creeper
TROGLODYTIDAE		WRENS
	Campylorhynchus brunneicapillus	Cactus wren
**	*Campylorhynchus brunneicapillus*	Coastal cactus wren
	Salpinctes obsoletus	Rock wren
	Catherpes mexicanus	Canyon wren
	Thryomanes bewickii	Bewick's wren
	Troglodytes aedon	House wren
	Cistothorus palustris	Marsh wren
CINCLIDAE		DIPPERS
	Cinclus maxicanus	American dipper
MUSCICAPIDAE		THRUSHES AND ALLIES
	Ixoreus naevius	Varied thrush
	Regulus calendula	Ruby-crowned kinglet
	Polioptila caerula	Blue-gray gnatcatcher
**	*Polioptila melanura*	Black-tailed gnatcatcher
**	*Polioptila californica*	California gnatcatcher
	Sialia mexicana	Western bluebird
	Sialia currucoides	Mountain bluebird
	Myadestes townsendi	Townsend's solitaire
	Catharus ustulatus	Swainson's thrush
	Catharus guttatus	Hermit thrush

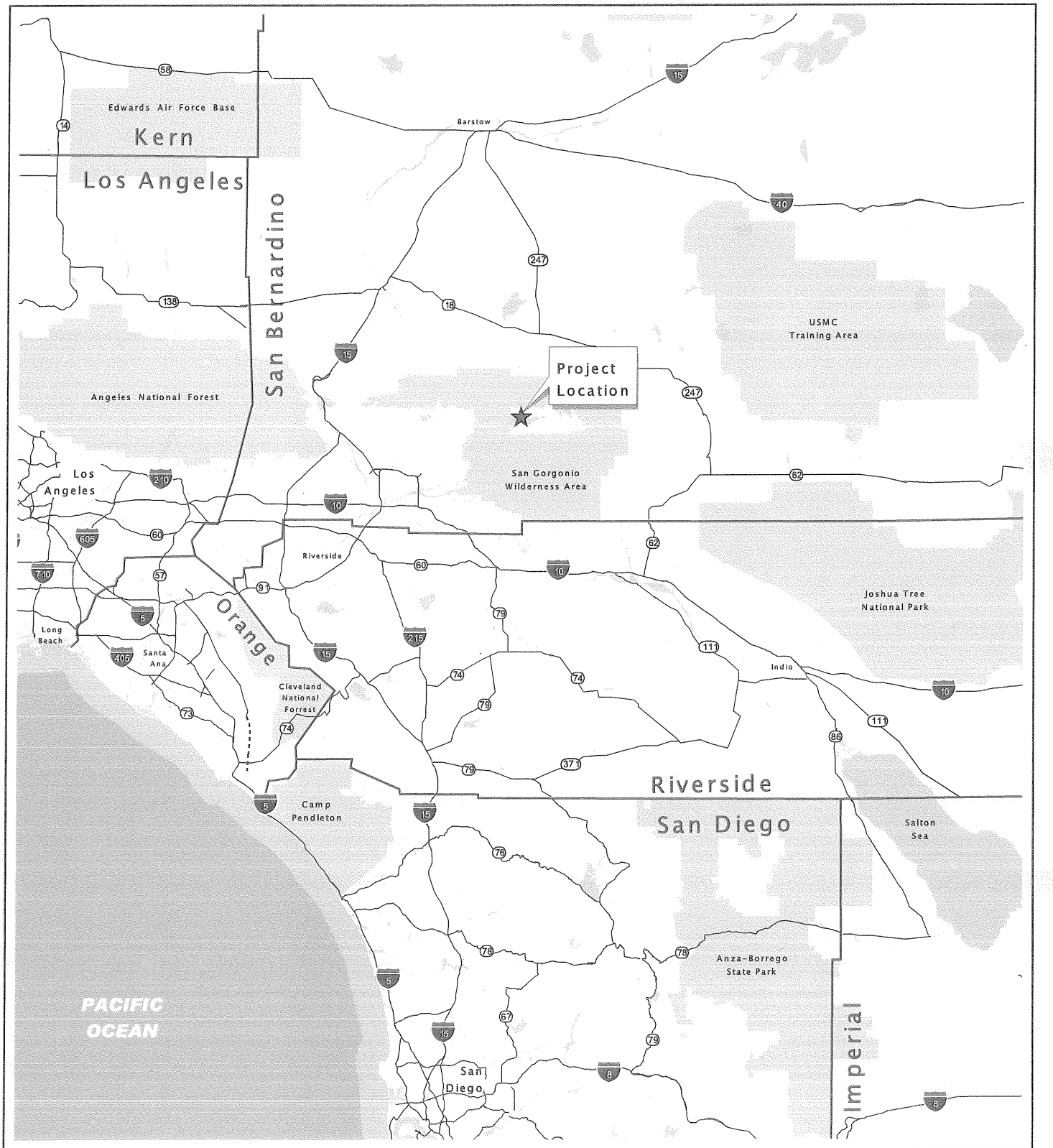
	Turdus migratorius	American robin
	Chamaea fasciata	Wrentit
	MIMIDAE	MOCKINGBIRDS AND THRASHERS
	Mimus polyglottos	Northern mockingbird
	Oreoscoptes montanus	Sage thrasher
	Toxostoma redivivum	California thrasher
**	*Toxostoma crissale*	Crissal thrasher
**	*Tosxostoma lecontei*	Le Conte's thrasher
	MOTACILLIDAE	WAGTAILS AND PIPITS
	Anthus spinoletta	American pipit
	BOMBYCILLIDAE	WAXWINGS
	Bombycilla cedrorum	Cedar waxwing
	PTILOGONATIDAE	SILKY FLYCATCHERS
	Phainopepla nitens	Phainopepla
	LANIIDAE	SHRIKES
	Lanius ludovicianus	Loggerhead shrike
	STURNIDAE	STARLINGS
*	*Sturnus vulgaris*	European starling
	VIREONIDAE	VIREOS
**	*Vireo bellii*	Bell's vireo
**	*Vireo vicinior*	Gray vireo
	Vireo solitarius	Solitary vireo
	Vireo huttoni	Hutton's vireo
	Vireo gilvus	Warbling vireo
	EMBERIZIDAE	SPARROWS, WARBLERS, TANAGERS
	Vermivora celata	Orange-crowned warbler
	Vermivora ruficapilla	Nashville warbler
	Vermivora luciae	Lucy's warbler
**	*Dendroica petechia*	Yellow warbler
	Dendroica coronata	Yellow-rumped warbler
	Dendroica nigrescens	Black-throated gray warbler
	Dendroica occidentalis	Hermit warbler
	Dendroica townsendi	Townsend's warbler
	Oporornis tolmiei	MacGillivray's warbler
	Geothlypis trichas	Common yellowthroat
	Wilsonia pusilla	Wilson's warbler
**	*Icteria virens*	Yellow-breasted chat
**	*Piranga rubra*	Summer tanager
	Piranga ludoviciana	Western tanager
	Pheucticus melanocephalus	Black-headed grosbeak
	Guiraca caerulea	Blue grosbeak
	Passerina amoena	Lazuli bunting
	Pipilo chlorurus	Green-tailed towhee
	Pipilo erythrophthalmus	Rufous-sided towhee
	Pipilo crissalis	California towhee
	Pipilo aberti	Abert's towhee
	Aimophila ruficeps	Rufous-crowned sparrow
	Spizella passerina	Chipping sparrow
	Spizella breweri	Brewer's sparrow
	Spizella atrogularis	Black-chinned sparrow
	Pooecetes gramineus	Vesper sparrow
	Chondestes grammacus	Lark sparrow
	Amphispiza bilineata	Black-throated sparrow

	Amphispiza belli	Sage sparrow
	Passerculus sandwichensis	Savannah sparrow
	Passerella iliaca	Fox sparrow
	Melospiza melodia	Song sparrow
	Melospiza lincolnii	Lincoln's sparrow
	Zonotrichia atricapilla	Golden-crowned sparrow
	Zonotrichia leucophrys	White-crowned sparrow
	Junco hyemalis	Dark-eyed junco
	Agelaius phoeniceus	Red-winged blackbird
**	*Agelaius tricolor*	Tricolored blackbird
	Sturnella neglecta	Western meadowlark
	Xanthocephalus xanthocephalus	Yellow-headed blackbird
	Euphagus cyanocephalus	Brewer's blackbird
	Quiscalus mexicanus	Great-tailed grackle
	Molothrus ater	Brown-headed cowbird
	Icterus cucullatus	Hooded oriole
	Icterus galbula	Northern oriole
	Icterus parisorum	Scott's oriole
FRINGILLIDAE		FINCHES
	Carpodacus purpureus	Purple finch
	Carpodacus cassinii	Cassin's finch
	Carpodacus mexicanus	House finch
	Carduelis pinus	Pine siskin
	Carduelis psaltria	Lesser goldfinch
	Carduelis lawrencei	Lawrence's goldfinch
	Carduelis tristis	American goldfinch
PASSERIDAE		WEAVERS
*	*Passer domesticus*	House sparrow

MAMMALIA		MAMMALS
DIDELPHIDAE		OPOSSUMS
	Didelphis marsupialis	Common opossum
VESPERTILIONIDAE		EVENING BATS
	Pipistrellus hesperus	Western pipistrelle
LEPORIDAE		HARES AND RABBITS
	Lepus californicus	Black-tailed hare
	Sylvilagus audubonii	Audubon cottontail
	Sylvilagus bachmani	Brush rabbit
	Sylvilagus sp.	Cottontail
SCIURIDAE		SQUIRRELS
**	*Citellus mohavensis*	Mohave ground squirrel
**	*Citellus tereticaudis ssp. chlorus*	Coachella Valley ground squirrel
**	*Glaucomys sabrinus*	Northern flying squirrel
	Otospermophilus beecheyi	Beechey ground squirrel
	Ammospermophilus leucurus	Antelope ground squirrel
**	*Ammospermophilus nelsoni*	San Joaquin antelope ground squirrel
	Eutamias merriami	Merriam chipmunk
	Sciurus griseus	Western gray squirrel
GEOMYIDAE		POCKET GOPHERS
	Thomomys bottae	Botta pocket gopher
HETEROMYIDAE		POCKET MICE
	Perognathus sp.	Pocket mouse
	Perognathus longimembris	Little pocket mouse

**	*Perognathus longimembris ssp. brevinasus*	Los Angeles pocket mouse
	Perognathus formosus	Long-tailed pocket mouse
	Perognathus baileyi	Bailey pocket mouse
	Perognathus fallax	San Diego pocket mouse
	Perognathus californicus	California pocket mouse
	Perognathus spinatus	Spiny pocket mouse
	Dipodomys sp.	Kangaroo rat
	Dipodomys heermanni	Heermann kangaroo rat
	Dipodomys panamintinus	Panamint kangaroo rat
**	*Dipodomys stephensi*	Stephens' kangaroo rat
	Dipodomys ingens	Giant kangaroo rat
	Dipodomys merriami	Merriam kangaroo rat
**	*Dipodomys merriami ssp parvus*	Cismontsne Merriam kangaroo rat
	Dipodomys nitratoides	San Joaquin kangaroo rat
	Dipodomys agilis	Pacific kangaroo rat
	Dipodomys deserti	Desert kangaroo rat
CASTORIDAE		BEAVERS
	Castor canadensis	Beaver
CRICETIDAE		RATS AND MICE
	Reithrodontomys megalotis	Western harvest mouse
	Peromyscus crinitus	Canyon mouse
	Peromyscus californicus	California mouse
	Peromyscus eremicus	Cactus mouse
	Peromyscus maniculatus	Deer mouse
	Onychomys torridus	Southern grasshopper mouse
	Neotoma sp.	Wood rat
	Neotoma albigula	White-throated wood rat
	Neotoma lepida	Desert wood rat
	Neotoma fuscipes	Dusky-footed wood rat
	Microtus pennsylvanicus	Meadow mouse
	Microtus californicus	California meadow mouse
MURIDAE		OLD WORLD RATS AND MICE
*	*Mus musculus*	House mouse
CANIDAE		FOXES, WOLVES AND COYOTES
	Canis latrans	Coyote
	Vulpes macrotis	Kit fox
	Urocyon cinereoargenteus	Gray fox
URSIDAE		BEARS
*	*Ursus americanus*	Black bear
PROCYONIDAE		RACCOONS
	Bassariscus astutus	Ringtail
	Procyon lotor	Raccoon
MUSTELIDAE		WEASELS AND SKUNKS
	Mustela frenata	Long-tailed weasel
**	*Taxidea taxus*	American badger
	Spilogale putorius	Spotted skunk
	Mephitis mephitis	Striped skunk
FELIDAE		CATS
	Felis concolor	Mountain lion
	Lynx rufus	Bobcat
EQUIDAE		HORSES, BURROS AND ZEBRAS
*	*Equus astinus*	Feral donkey

CERVIDAE	ELKS, MOOSE, CARIBOU, DEER
Odocoileus hemionus	Mule deer
BOVIDAE	SHEEP AND GOATS
Ovis canadensis	Bighorn



Regional Location

Exhibit 1

Moon Camp - Tentative Tract 16136

N W E S

10 0 10 20 Miles

BonTerra CONSULTING

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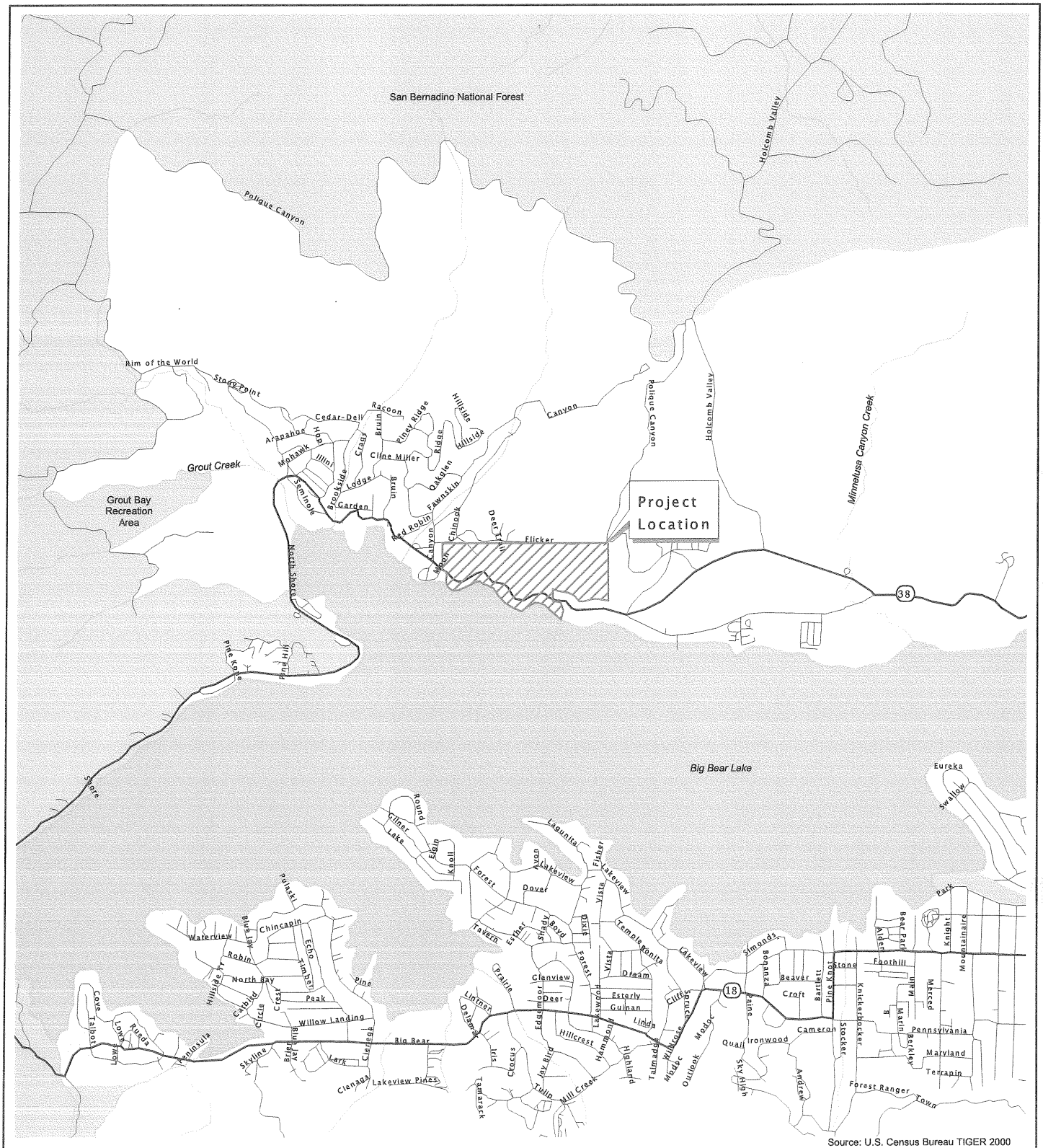

Local Vicinity

Exhibit 2

Moon Camp - Tentative Tract 16136

N W E S

0.25 0 0.25 0.5 Miles

BonTerra CONSULTING

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Big Bear

Lake

Legend

- Project Boundary
- Wright's Matting Buckwheat

Vegetation

- Pebble Plain
- Lakeshore
- Jeffrey Pine Forest
- Open Jeffrey Pine Forest
- Developed

Biological Resources

Exhibit 3

Moon Camp - Tentative Tract 16136

N W E S

250 0 250 Feet

Bonterra CONSULTING

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15.7 Cultural Resources Information

HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT

MOON CAMP RESIDENTIAL SUBDIVISION

Tentative Tract No. 16136
Fawnskin, San Bernardino County

Submitted to:

Glenn Lajoie, AICP, Vice President
RBF Consulting
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Submitted by:

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CRM TECH
2411 Sunset Drive
Riverside, CA 92506

April 3, 2002

CRM TECH Contract #782
Approximately 62.43 Acres
Fawnskin, Calif., 7.5' Quadrangle
Section 13, T2N R1W, San Bernardino Base Meridian
APNs 0304-082-14, 0304-091-12, 0304-091-13, and 0304-091-21
Site CA-SBR-10635H, Isolate P36-60758

MANAGEMENT SUMMARY

In March, 2002, at the request of RBF Consulting, CRM TECH performed a cultural resources study on approximately 62.43 acres of vacant land in the unincorporated community of Fawnskin, San Bernardino County, California. The subject property of the study, known as Tentative Tract No. 16136 (Moon Camp), is located on the north shore of Big Bear Lake, consisting of a portion of the north half of Section 13, T2N R1W, San Bernardino Base Meridian. The study is part of the environmental review process for the proposed subdivision of the property into single-family residential lots. The County of San Bernardino, as Lead Agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA). The purpose of the study is to provide the County with the necessary information and analysis to determine whether the proposed subdivision would result in substantial adverse changes to any historical/archaeological resources that may exist in or around the project area, as mandated by CEQA.

In order to identify and evaluate such resources, CRM TECH conducted a historical/archaeological resources records search, pursued historical background research, and carried out an intensive-level field survey. The records search results indicate that a prehistoric isolate, P36-60758, was previously recorded in the project area in 1987, and a possible Native American burial ground has been reported in the general vicinity. The historical research results, meanwhile, suggest that the project area may have hosted one of possibly two early resort camps that dated back at least to the 1920s. The field survey revealed no evidence of P36-60758 or any other prehistoric sites, features, or artifacts, but encountered a historic-period archaeological site in the southeastern portion of the project area, which was subsequently designated CA-SBR-10635H. Consisting of a heavily disturbed scatter of rusted cans, glass fragments, ceramic sherds, and other historic-period artifacts mixed with modern trash, the site lies on the edge of a much larger refuse deposit located mostly on the adjacent property to the east, around an old structure foundation at that location.

Since many of the artifacts at CA-SBR-10635H can be dated to the pre-WWII period, it is possible—and indeed probable—that the refuse scatter was deposited in connection with the early 20th century resort camps known to be in operation in the vicinity. However, due to the limited number and types of the artifacts observed, there is insufficient evidence to establish this association conclusively, or association with any persons or events of recognized historic significance. Furthermore, the site in fact constitutes a minor component of a larger historic-period refuse deposit located outside the project area, and its limited information potential is further diminished by extensive disturbances and the intrusion of modern trash. Based on these considerations, the present study concludes that Site CA-SBR-10635H does not appear to meet the official definition of a "historical resource," as provided by CEQA.

In light of the study results summarized above, CRM TECH recommends that the County of San Bernardino may reach a finding that the project as currently proposed will have *no impact* on any known historical resources. However, because of the reported Native American burial ground in the vicinity and the presence of early resort camps in the 1920s, the project area as a whole remains highly sensitive for possible subsurface archaeological deposits from both the prehistoric and the historic periods. In order to properly identify, evaluate and, if necessary, protect such deposits, any grading, grubbing, trenching, excavations, and/or other earth-moving activities in the project area should be monitored by a qualified archaeologist. Under this condition, the proposed project may be cleared to proceed in compliance with the cultural resources provisions of CEQA.

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INTRODUCTION

In March, 2002, at the request of RBF Consulting, CRM TECH performed a cultural resources study on approximately 62.43 acres of vacant land in the unincorporated community of Fawnskin, San Bernardino County, California (Fig. 1). The subject property of the study, known as Tentative Tract No. 16136 (Moon Camp), is located on the north shore of Big Bear Lake, consisting of a portion of the north half of Section 13, T2N R1W, San Bernardino Base Meridian (Fig. 2). The study is part of the environmental review process for the proposed subdivision of the property into single-family residential lots. The County of San Bernardino, as Lead Agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA; PRC §21000, et seq.).

CRM TECH performed the present study to provide the County of San Bernardino with the necessary information and analysis to determine whether the proposed subdivision would result in substantial adverse changes to any historical/archaeological resources that may exist in or around the project area, as mandated by CEQA. In order to identify and evaluate such resources, CRM TECH conducted a historical/archaeological resources records search, pursued historical background research, and carried out an intensive-level field survey. The following report is a complete account of the methods, results, and final conclusion of the study.

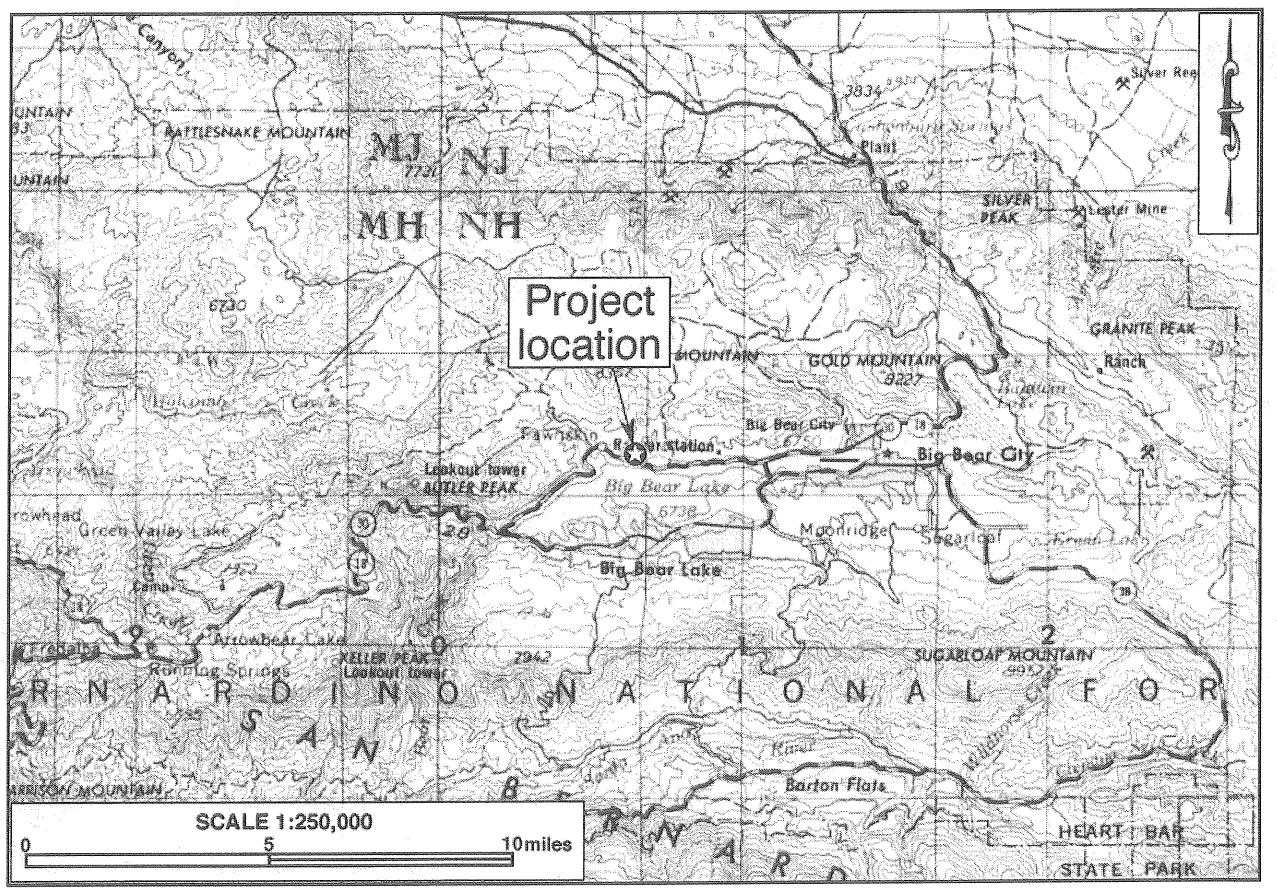

Figure 1. Project vicinity. (Based on USGS San Bernardino, Calif., 1:250,000 quadrangle [USGS 1969])

Figure 2. Project area. (Based on USGS Big Bear Lake and Fawnskin, Calif., 1:24,000 quadrangles [USGS 1994a; 1994b)

SETTING

CURRENT NATURAL SETTING

As mentioned above, the project area is situated on the north shore of Big Bear Lake, a man-made lake in the San Bernardino Mountains. More specifically, it lies in the relatively undeveloped eastern portion of the small mountain community of Fawnskin, along a segment of North Shore Drive (SR 38) between the intersections of Oriole Lane and Polique Canyon Road. Located within the boundaries of the San Bernardino National Forest but not owned by the U.S. Forest Service, the project area provides for public access to both the lakeshore and the forestland.

The project area is flanked by existing residential properties to its northwest and southeast, but the only improvement currently present in the project boundaries is North Shore Drive, along with various dirt roads and trails. The terrain slopes gently from south to north, and supports a Jeffrey pine forest (Fig. 3). Pebble plain habitat occurs in scattered patches in the western portion of the project area. Elevations range from 6,747 feet at the lakefront to 6,960 at the northeast boundary, with a total relief of 483 feet and slopes between 5 and 40 percent. A natural drainage occurs in the eastern portion of the project area, flowing from north to south (Fig. 2). Other small drainage courses occur throughout the property.

CULTURAL SETTING

Prehistoric Context

The project area lies in the heart of the homeland of the Serrano Indians, whose traditional territory is centered at the San Bernardino Mountains, but also includes the southern rim of the Mojave Desert, extending from today's Victorville eastward to Twentynine Palms. The name "Serrano" was derived from a Spanish term meaning "mountaineer" or "highlander." The basic written sources on Serrano culture are Kroeber (1925), Strong (1929), and Bean and Smith (1978). The following ethnographic discussion of the Serrano people is based on these sources.

Prior to European contact, the Serranos were primarily gatherers and hunters, and occasional fishers, who settled mostly where flowing water emerged from the mountains. Because of the variation in their habitat, the vegetable staples of the Serrano included both

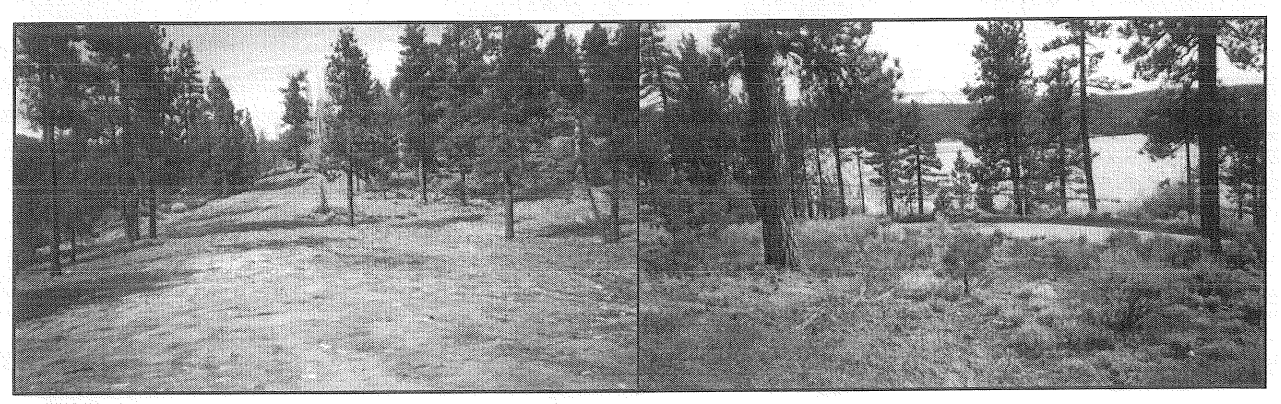

Figure 3. Typical landscapes in the project area.

plant foods common in the mountains, such as acorns and piñon nuts, and those common in the desert, such as honey mesquite, yucca roots, mesquite, and cactus fruits. Game animals, including deer, mountain sheep, antelope, birds, rabbits and other small rodents, were hunted with tools and techniques quite similar to those employed by other southern California Indians. Technologically, the Serrano were also similar to their neighbors. Shell, wood, bone, stone, and plant fibers were used in making a variety of implements, such as lavishly decorated baskets, pottery, rabbit-skin blankets, and musical instruments.

The Serrano were loosely organized into exogamous clans, led by hereditary heads, and the clans in turn were affiliated with one of two exogamous moieties. The exact nature of the clans, their structure, function, and number are not known, except that each clan was the largest autonomous political and landholding unit, the core of which was the patrilineage. There was no pan-tribal political union among the clans. The Bear Valley, in which Big Bear Lake is located, was identified by Kroeber (1925:618) to be the territory of the *Yuhaviatam* or *Kuchaviatam* clan, which occupied a village in the vicinity named *Yuhaviat,* meaning "pine place." Strong (1929:11), however, suggests that the Bear Valley was shared between the *Yuhavetum* (*Yuhaviatam*) clan and the *Pervetum* clan.

Although contact with Europeans may have occurred as early as 1771 or 1772, Spanish influence on Serrano lifeways was negligible until 1819, when an *assistencia* under the San Gabriel Mission was established in present-day Redlands, on the edge of Serrano territory. Between then and the end of the mission era in 1834, most of the Serranos in the San Bernardino Mountains were removed to the nearby missions. At present, most Serrano descendants are found on the San Manuel and the Morongo Indian Reservations, where they participate in ceremonial and political affairs with other Native American groups on an inter-reservation basis.

Historic Context

In 1772, a small force of Spanish soldiers under the command of Pedro Fages became the first Europeans to set foot in the San Bernardino Mountains, followed shortly afterwards by Francisco Garcés, the famed explorer, in 1776. During the next 70 years, however, the Spanish/Mexican colonization activities in Alta California, which concentrated predominantly in the coastal regions, left little physical impact on the San Bernardinos. Aside from occasional explorations and punitive expeditions against Indian livestock raiders, the mountainous hinterland of California remained largely beyond the attention of the missionaries, the *rancheros,* and the provincial authorities. The name "San Bernardino" was bestowed on the region at least by 1819, when a mission rancho bearing that name was established in the valley lying to the south under the supervision of Mission San Gabriel.

After the American annexation of California in 1848, the rich resources offered by the mountains brought drastic changes to the San Bernardinos, spurred by the influxes of settlers from the eastern United States. Beginning in the early 1850s, the dense forest was turned into the scene—and victim—of a booming lumber industry, which brought the first wagon roads and industrial establishments into the San Bernardinos. In 1860, the discovery of gold in the Bear and Holcomb Valleys ushered in a miniature gold rush, and with it a number of mining towns with several thousand residents. Around the same time, the lush mountain range also attracted cattlemen, sheepmen, and their herds, and within the next two decades gained the reputation of being the best summer grazing land in

southern California. Then in 1884-1885, an even more valuable resource in arid southern California, water, became the focus of development in the San Bernardinos when the Bear Valley Land and Water Company created the Big Bear Lake reservoir to ensure the success and prosperity of the Redlands colony.

By the 1890s, excessive logging and sheep grazing in the San Bernardino Mountains had given rise to a forest conservation movement among residents of the San Bernardino Valley to protect the watershed. The movement succeeded, in 1893, in persuading the U.S. government to create the San Bernardino Forest Reserve, later renamed the San Bernardino National Forest, and over the next few decades effectively brought an end to logging and sheep grazing in the San Bernardinos. In the meantime, the favorable climate, enticing scenery, and the string of man-made lakes gradually propelled the resort industry to the forefront of development in the San Bernardinos, burgeoning from the first commercial resort established on the shore of Big Bear Lake in 1888. In 1915, the budding industry received a major boost from the completion of the automobile highway known as Rim of the World Drive. Since then, the San Bernardinos have grown into—and remain—one of southern California's most popular tourism attractions.

The community of Fawnskin, the largest settlement on the north shore of Big Bear Lake, was founded in 1916, at the onset of a great building boom in Bear Valley. In that year, two Los Angeles businessmen, William Cline and Clinton E. Miller, purchased some 700 acres at this location with plans to develop a major resort surrounded by expensive summer homes. Initially named Grout after Grout Bay, which it overlooks, the community was soon renamed Fawnskin after nearby Fawnskin Valley, which had been known by that name since 1891. The Fawnskin post office was established in 1918, and Cline and Miller's resort was completed the next year. By then, Fawnskin had already grown into a community of more than 100 summer homes, with a string of other resort camps lining the lakeshore to its east. Among these resorts were Moon Camp and Wilsted's Camp, both located in the immediate vicinity of the current project area, as discussed in further detail below[1].

RESEARCH METHODS

RECORDS SEARCH

The Archaeological Information Center (AIC) at the San Bernardino County Museum, Redlands, provided the records search service for this study. The AIC is the official cultural resource records repository for San Bernardino County, and a part of the California Historical Resource Information System, established and maintained under the auspices of the Office of Historic Preservation.

During the records search, Robin Laska, AIC Assistant Coordinator, checked the Center's electronic database for previously identified historical/archaeological resources in or near the project area, and existing cultural resources reports pertaining to the vicinity. Previously identified historical/archaeological resources include properties designated as California Historical Landmarks, Points of Historical Interest, or San Bernardino County

1. For further discussion of the history of Fawnskin and the San Bernardino Mountains, see Robinson (1989) and LaFuze (1971).

Historical Landmarks, as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resource Information System.

HISTORICAL RESEARCH

Historical background research for this study was conducted by CRM TECH historian Bai "Tom" Tang (see App. 1 for qualifications) on the basis of published literature in local and regional history and historic maps of the project vicinity. Among maps consulted for the research were the U.S. General Land Office's (GLO) land survey plat maps dated 1858 and 1896, and the U.S. Geological Survey's (USGS) topographic maps dated 1899 and 1954. These maps are collected at the Science Library of the University of California, Riverside, and the California Desert District of the U.S. Bureau of Land Management, also located in Riverside.

FIELD SURVEY

On March 21, 2002, CRM TECH archaeologists Adrián Sánchez Moreno and Daniel Ballester (see App. 1 for qualifications) carried out the intensive-level, on-foot field survey of the project area. During the survey, Moreno and Ballester walked the entire project area along parallel north-south transects spaced 15 meters (ca. 50 feet) apart. In this way, the ground surface was systematically inspected for any evidence of human activities dating to the prehistoric or historic periods (i.e., 50 years ago or older). Special attention was paid to animal burrow backdirt, rock outcrops, and unusual natural features. Later, Ballester revisited the property on April 2 to complete site recordation of a historic-period refuse scatter discovered during the survey (see "Field Survey Results," below).

RESULTS AND FINDINGS

RECORDS SEARCH RESULTS

According to records on file at the Archaeological Information Center, a portion of the project area, near its western end, was previously surveyed for cultural resources in 1987 (Fig. 4), and two prehistoric—i.e., Native American—artifacts were discovered during that survey (Schroth 1987:5). The two artifacts included a groundstone fragment and a chipped stone tool, and were recorded as an isolate (P36-60758). Since they were found in a deep wash, it was suspected that these artifacts did not occur *in situ* but were rather washed to that location from upper slopes (Schroth 1987:1, 5). No other cultural resources studies had taken place in the project area prior to this study, and no other cultural resources had been identified within the project boundaries.

Outside the project area but within a one-mile radius, ten other previous studies have been reported to the AIC (Fig. 4). As a result of these and other studies in the vicinity, two archaeological sites have been recorded within the one-mile scope of the records search, and four other possible cultural resources have been reported and, since they have not been formally recorded, designed by the AIC as pending sites. One of the two recorded sites, CA-SBR-4400, consisted of a scatter of chipped stone flakes, and has since been destroyed. The other site, CA-SBR-9937H, was the Miller School House in Fawnskin, a one-room

schoolhouse originally built in 1925. The four pending sites were described mainly as scattered chipped stone flakes, projectile point fragments, and/or ceramic sherds, but also included a purported Native American burial ground from the 19th century.

The majority of these previously identified cultural resources were found far enough from the project area not to be a concern for this study. However, P36-60758, the isolate recorded in 1987, was located in the western portion of the project area, as mentioned above, and the purported Native American burial ground may have been in close proximity to the eastern end of the project area, based on what little information was available at the AIC. These two potential cultural resources, therefore, were among the focal points of the field survey efforts.

HISTORICAL RESEARCH RESULTS

Historical sources consulted for this study indicate that development activities in and around the project area began in the 1910s-1920s, coinciding roughly with the birth of the nearby resort town of Fawnskin. Prior to that, the only man-made feature known to be present in the vicinity of the project area was a road "from San Bernardino to Pine Lake Post Office," the latter being located in the present-day City of Big Bear Lake (Figs. 5-7). As Figures 6 and 7 illustrate, the road skirted around the southern side of the project area, just outside the project boundary, over land that has since been inundated by the lake after construction of the current Big Bear Dam raised its water level in 1911-1912.

In 1915, the completion of Rim of the World Drive, the automobile highway that made the mountain resorts accessible to the "flatlanders," ushered in a period of phenomenal growth

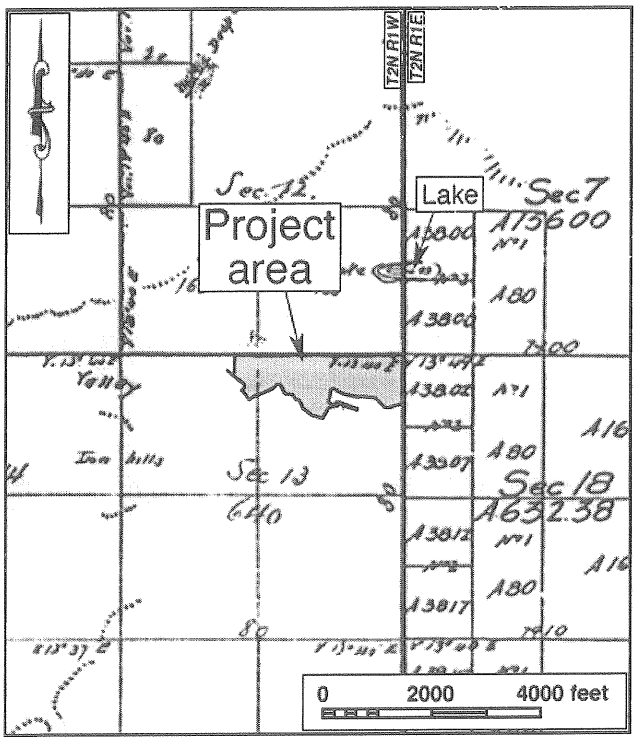

Figure 5. The project area and vicinity in 1857-1858. (Source: GLO 1858a; 1858b)

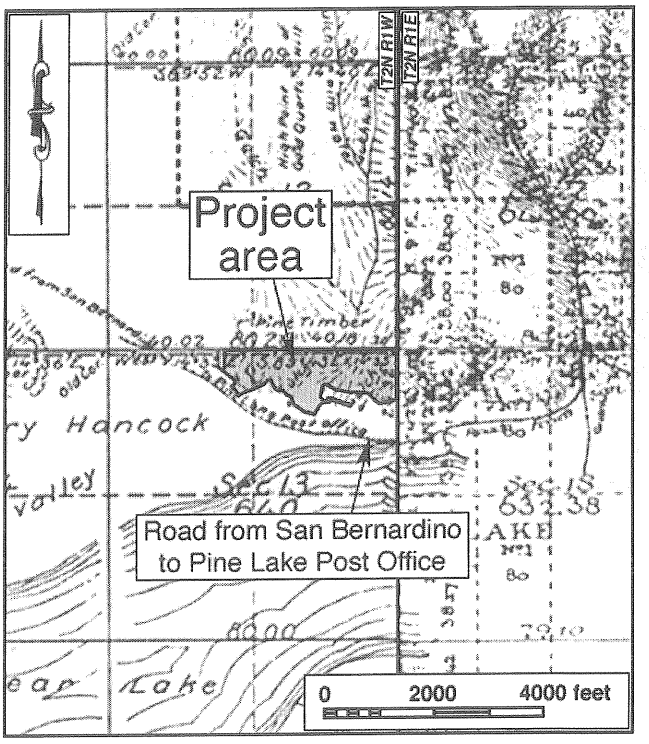

Figure 6. The project area and vicinity in 1894. (Source: GLO 1896a; 1896b)

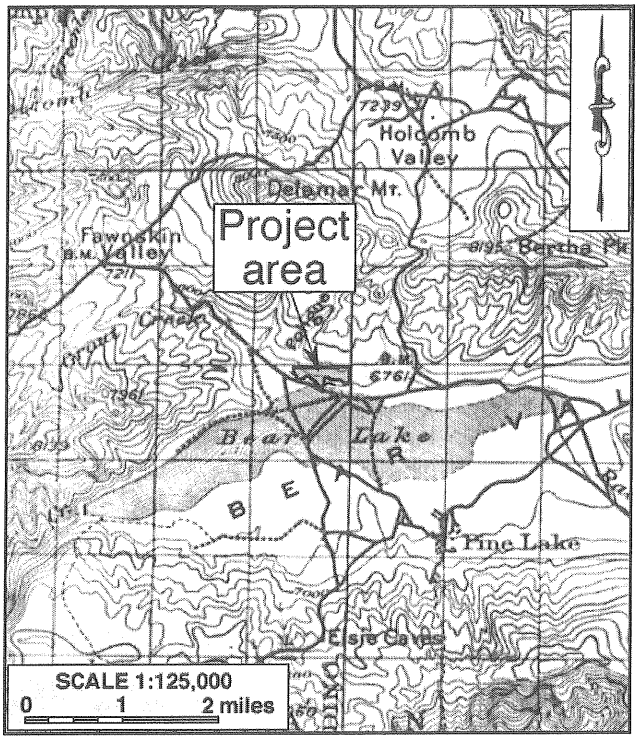

Figure 7. The project area and vicinity in 1899. (Source: USGS 1902)

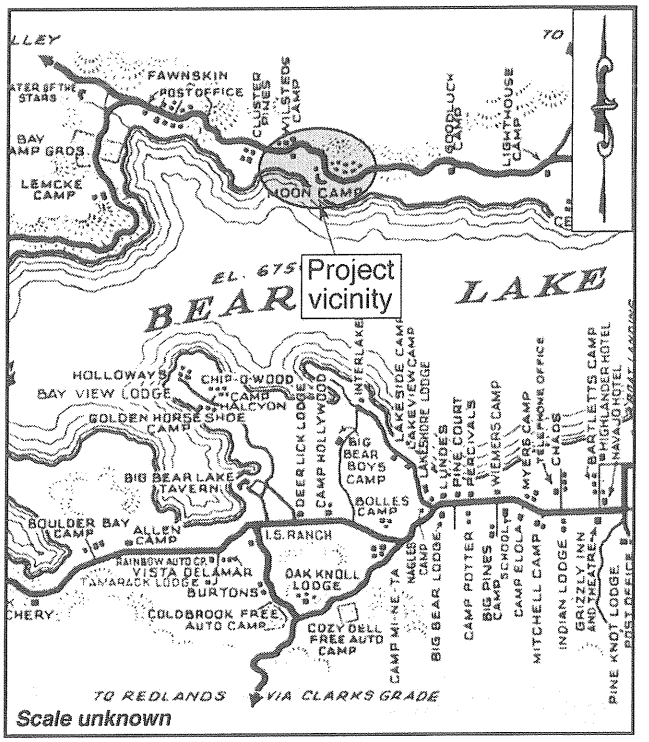

Figure 8. The project area and vicinity in 1928. (Source: Robinson 1989:193)

in Bear Valley. Between 1913 and 1921, the number of resorts in the valley mushroomed from 2 to 52 (Drake 1949:24-26; Robinson 1989:183-185). Although the vast majority of them were concentrated on the south shore of the lake, by 1928 at least nine commercial camps or lodges were in operation along the north shore to the east of Fawnskin (Robinson 1989:187, 193 [Fig. 8]). Two of these, Wilsted's Camp and Moon Camp, were evidently located in the immediate vicinity of the project area, and possibly within the project boundaries (Fig. 8).

In the 1940s, a large number of buildings were noted in the project area, clustered mostly around the two curves in the highway (Fig. 9). While the exact nature of these buildings is not identified in sources consulted during this research, their presence probably attests to the heyday of the resort camps around Big Bear Lake, especially in the midst of the post-WWII prosperity. During the 1950s and the early

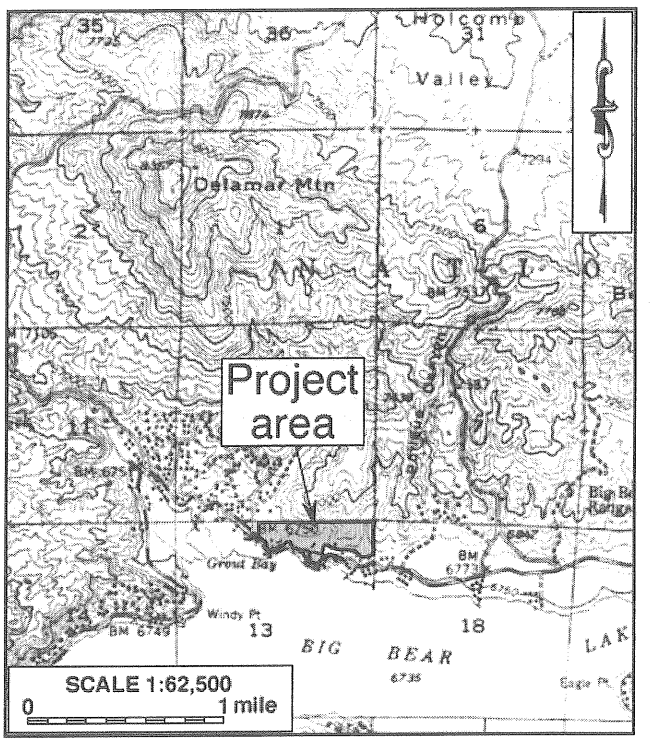

Figure 9. The project area and vicinity in 1945. (Source: USGS 1947)

1960s, however, rapid advances in modern transportation technology and the resulting shift in American lifestyle began to erode the popularity of such resort camps. Perhaps reflecting that trend, by 1969-1971, the buildings that once occupied the western portion of the project area had disappeared (Fig. 10). Since then, all buildings on the property have been removed.

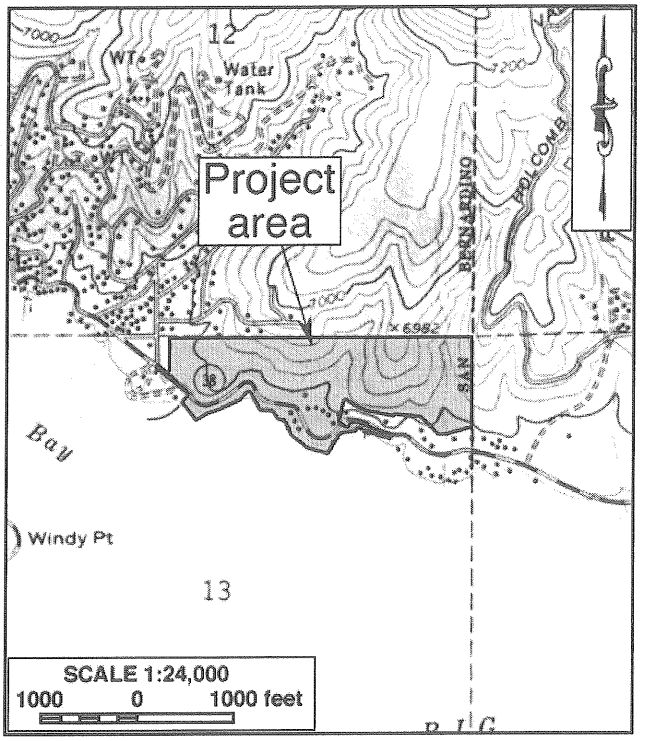

Figure 10. The project area and vicinity in 1969-1971. (Source: USGS 1971)

In summary, the results of historical background research suggest that the project area may have hosted one of possibly two of the early resort camps that helped transform Big Bear Lake into the popular playground it is today, and both of them date to at least the 1920s. The search for possible remains of these camps, thus, formed another focal point of the archaeological field investigations.

FIELD SURVEY RESULTS

No prehistoric sites, features, or artifacts were encountered during the field survey. A diligent effort was made to search for any surface manifestation of the reported Native American burial ground, but none was found. Nor could either of the two prehistoric artifacts noted in the project area in 1987 (P36-60758) be located during the survey. Remnants of picnic sites were observed on the northern side of North Shore Drive, but all were determined to be of recent origin.

In the southeastern portion of the project area, the field survey revealed the presence of a historic-period refuse scatter, which was recorded as an archaeological site and subsequently designated CA-SBR-10635H (Fig. 11). The artifact deposit at this location has been heavily disturbed by apparent bottle-hunting activities, and presumably many of the more valuable artifacts have been removed. The remaining artifacts include rusted cans, glass fragments, ceramic sherds, pieces of wood or metal, and other historic-period artifacts mixed with modern trash (Figs. 12, 13). Among the more notable items are nine cone-top beer cans, seven solder drop cans, two broken glass bottles, two fragments of an aqua glass insulator, and an old battery (Fig. 14). Some of the artifacts, such as the cone-top and solder drop hole-in-cap cans, generally date to the 1930s-1940s, while others, such as the punch-top steel can, may have come from as late as the 1950s-1960s.

Most of the artifacts were found in two concentrations, each centered around a large pit dug recently by bottle hunters (Fig. 13). Several more looters' pits have been dug in and around the two larger pits. In all, the site measures approximately 61 feet along the north-south axis and 49 feet along the east-west axis within the project area, but the refuse scatter extends farther east beyond the project boundaries. In fact, CA-SBR-10635H can be seen as the edge of a much larger refuse deposit located mostly on the adjacent property, around an old structure foundation at that location.

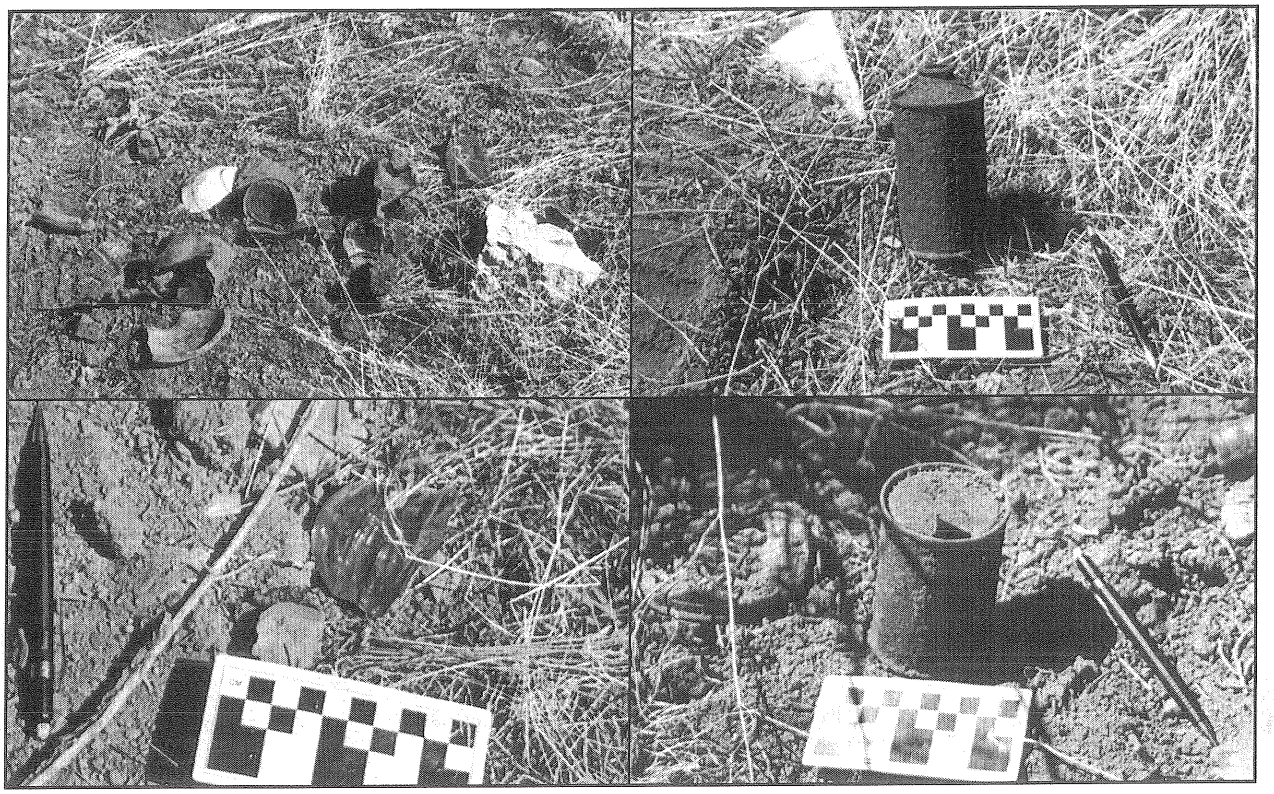

Figure 14. Typical artifacts at Site CA-SBR-10635H. *Clockwise from top left*: a cluster of broken cans and glass and ceramic fragments, apparently bottle-hunters' discards; cone-top beer can; punch-top steel can; fragment of an aqua glass insulator.

DISCUSSION

Based on the research results discussed above, the following sections present CRM TECH's conclusion on whether Site CA-SBR-110635H, the only historical/archaeological feature encountered within the project area, meets the official definitions of a "historical resource," as provided in the California Public Resources Code, in particular CEQA.

DEFINITION

According to PRC §5020.1(j), "'historical resource' includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California." More specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the Lead Agency (Title 14 CCR §15064.5(a)(1)-(3)).

Regarding the proper criteria for the evaluation of historical significance, CEQA guidelines mandate that "a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of

Historical Resources" (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

SITE EVALUATION

Site CA-SBR-10635H, as stated above, consists of a historic-period refuse scatter. Since many of the artifacts at the site can be dated to the pre-WWII period, it is possible—and indeed probable—that the items were deposited in connection with the early 20th century resort camps known to be in operation in the vicinity. However, due to the limited number and types of the artifacts observed, there is insufficient evidence to establish this association conclusively, or association with any persons or events of recognized historic significance. Furthermore, the site constitutes a minor component of a larger historic-period refuse deposit located outside the project area, and its limited information potential is further diminished by extensive disturbances and the intrusion of modern trash. Based on these considerations, CRM TECH concludes that Site CA-SBR-10635H, as recorded during this study, does not appear to meet any of the criteria for listing in the California Register, and thus does not qualify as a "historical resource."

RECOMMENDATIONS

CEQA establishes that "a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (PRC §21084.1). "Substantial adverse change," according to PRC §5020.1(q), "means demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired."

Site CA-SBR-110635H, the only historical/archaeological feature encountered within the project area, has been determined not to constitute a "historical resource," as defined by CEQA. However, because of the reported Native American burial ground in the vicinity and the presence of early resort camps in the 1920s, the project area as a whole remains highly sensitive for possible subsurface archaeological deposits from both the prehistoric and the historic periods. Based on these considerations, CRM TECH presents the following recommendations to the County of San Bernardino:

- No historical resources have been identified within or adjacent to the project area, and therefore the project, as currently proposed, will not cause substantial adverse changes to any known historical resources.
- Project-related grading, grubbing, trenching, excavations, and/or other earth-moving activities in the project area should be monitored by a qualified archaeologist.

CONCLUSION

The foregoing report has provided background information on the project area, outlined the methods used in the current study, and presented the results of the various avenues of research. As a result of these procedures, a historic-period archaeological site, CA-SBR-10635H, was identified and recorded within the project area. The site consists of a small and heavily disturbed portion of a historic-period refuse scatter, and was determined not to meet CEQA's definition of a "historical resource." The proposed project, therefore, will have *no impact* on any known historical resources. However, due to the demonstrated sensitivity of the project area for possible subsurface cultural remains from both the prehistoric and the historic periods, archaeological monitoring is recommended during any earth-moving activities in the project area. Under this condition, the proposed project may be cleared to proceed in compliance with the cultural resources provisions of CEQA.

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1858b Plat Map: Township No. 2 North Range No. 1 West, San Bernardino Meridian; surveyed in 1857.
1896a Plat Map: Township No. 2 North Range No. 1 East, San Bernardino Meridian, California; surveyed in 1894.
1896b Plat Map: Township No. 2 North Range No. 1 West, San Bernardino Meridian, California; surveyed in 1894.

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1947 Map: Lucerne Valley, Calif. (15', 1:62,500); aerial photographs taken in 1945.
1969 Map: San Bernardino, Calif. (1:250,000); 1958 edition revised.
1971 Map: Fawnskin, Calif. (7.5', 1:24,000); aerial photographs taken in 1969, field-checked in 1971.
1994a Map: Big Bear Lake, Calif. (7.5', 1:24,000); 1970 edition photorevised in 1983 and photoinspected in 1989.
1994b Map: Fawnskin, Calif. (7.5', 1:24,000); 1971 edition photorevised in 1980 and photoinspected in 1989.

APPENDIX 1:
PERSONNEL QUALIFICATIONS

PRINCIPAL INVESTIGATOR

Bruce Love, Ph.D., RPA (Register of Professional Archaeologists)

Education

1986	Ph. D., Anthropology, University of California, Los Angeles.
1981	M.A., Anthropology, University of California, Los Angeles.
1976	B.A., Anthropology, University of California, Los Angeles.
1996	"CEQA 101," presented by the Association of Environmental Professionals.
1995	"CEQA Workshop," presented by Association of Environmental Professionals.
1994	"Assessing the Significance of Historic Archaeological Sites," presented by the Historic Preservation Program, University of Nevada, Reno.
1994	"CEQA 1994: Issues, Trends, and Advanced Topics," presented by UCLA Extension.
1990	"Introduction to Federal Projects and Historic Preservation Law," presented by U.S. General Services Administration Training Center.

Professional Experience

1993-	Owner and Principal, CRM TECH, Riverside.
1990-1993	Director, Archaeological Research Unit, UC Riverside; Coordinator, Archaeological Information Center, UC Riverside.
1989-1990	Coordinator, Archaeological Information Center, UCLA.
1987-1990	Owner and Principal, Pyramid Archaeology, Palmdale, California.
1986-1987	Junior Fellow, Dumbarton Oaks Center for Pre-Columbian Research, Washington, D.C.
1981-1986	Part-time cultural resources management consultant; doctoral student at UCLA.

Memberships

Register of Professional Archaeologists.
Association of Environmental Professionals.
American Planning Association.
Society for American Archaeology.
Society for California Archaeology.
Pacific Coast Archaeological Society.
Coachella Valley Archaeological Society.
Archaeological Survey Association.

PROJECT HISTORIAN

Bai "Tom" Tang, M.A.

Education

1988-1993	Graduate Program in Public History/Historic Preservation, UC Riverside.
1987	M.A., American History, Yale University, New Haven, Connecticut.
1982	B.A., History, Northwestern University, Xi'an, China.
2000	"Introduction to Section 106 Review," presented by the Advisory Council on Historic Preservation and the University of Nevada, Reno.
1994	"Assessing the Significance of Historic Archaeological Sites," presented by the Historic Preservation Program, University of Nevada, Reno.

Professional Experience

1993-	Project Historian, CRM TECH, Riverside, California.
1993-1997	Project Historian, Greenwood and Associates, Pacific Palisades, California.
1991-1993	Project Historian, Archaeological Research Unit, UC Riverside.
1990	Intern Researcher, California State Office of Historic Preservation, Sacramento.
1990-1992	Teaching Assistant, History of Modern World, UC Riverside.
1988-1993	Research Assistant, American Social History, UC Riverside.
1985-1988	Research Assistant, Modern Chinese History, Yale University.
1985-1986	Teaching Assistant, Modern Chinese History, Yale University.
1982-1985	Lecturer, History, Xi'an Foreign Languages Institute, Xi'an, China.

Honors and Awards

1988-1990	University of California Graduate Fellowship, UC Riverside.
1985-1987	Yale University Fellowship, Yale University Graduate School.
1980, 1981	President's Honor List, Northwestern University, Xi'an, China.

Cultural Resources Management Reports

Preliminary Analyses and Recommendations Regarding California's Cultural Resources Inventory System (With Special Reference to Condition 14 of NPS 1990 Program Review Report). California State Office of Historic Preservation working paper, Sacramento, September 1990.

Numerous cultural resources management reports with the Archaeological Research Unit, Greenwood and Associates, and CRM TECH, since October 1991.

Membership

California Preservation Foundation.

PROJECT ARCHAEOLOGIST

Adrián Sánchez Moreno, B.A.

Education

1999 B.A., Anthropology (with emphasis in Archaeology), University of San Diego.

Professional Experience

2000- Project Archaeologist, CRM TECH, Riverside.
1999 Field Crew, excavation in Camp Pendleton Marine Corps Air Base, Oceanside. K.E.A. Environmental, San Diego.
1999 Field Crew, excavation at Freedmen's Cemetery site in Alexandria, Virginia. URS Greiner Woodward & Clyde.
1999 Field Crew, survey and excavation in Guerrero Negro, Mexico.
- Including identification of osteological specimens.

1999 Field Crew, excavation at Lake Chapala, Baja California, Mexico.
- Excavation and cataloguing of lithic artifacts from the oldest known site in Baja California.

1998 Field Crew, petroglyph survey in San Pedro Atacama, Chile.
- Focusing on identification of possible habitation and petroglyph sites.

PROJECT ARCHAEOLOGIST

Daniel Ballester, B.A.

Education

1998 B.A., Anthropology, California State University, San Bernardino.
1997 Archaeological Field School, University of Las Vegas and University of California, Riverside.
1994 University of Puerto Rico, Rio Piedras, Puerto Rico.

Professional Experience

1999- Project Archaeologist, CRM TECH, Riverside.
1998-1999 Field Crew, K.E.A. Environmental, San Diego.
- Two and a half months of excavations on Topomai village site, Camp Pendleton.

1998 Field Crew, A.S.M. Affiliates, Encinitas.
- Two weeks of excavations on a site on Red Beach, Camp Pendleton, and two weeks of survey in Camp Pendleton, Otey Mesa, and Encinitas.

1998 Field Crew, Archaeological Research Unit, University of California, Riverside.
- Two weeks of survey in Anza Borrego Desert State Park and Eureka Valley, Death Valley National Park.

PALEONTOLOGICAL RESOURCES ASSESSMENT REPORT

MOON CAMP RESIDENTIAL SUBDIVISION

Tentative Tract No. 16136
Fawnskin, San Bernardino County

Submitted to:

Glenn Lajoie, AICP, Vice President
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618-2027

Submitted by:

Harry M. Quinn, Geologist/Paleontologist
CRM TECH
2411 Sunset Drive
Riverside, CA 92506

Bruce Love, Principal

April 8, 2002

CRM TECH Contract #783
Approximately 62.43 Acres
Fawnskin, Calif., 7.5' Quadrangle
Section 13, T2N R1W, San Bernardino Base Meridian
APNs 0304-082-14, 0304-091-12, 0304-091-13, and 0304-091-21

MANAGEMENT SUMMARY

In March, 2002, at the request of RBF Consulting, CRM TECH performed a paleontological resource assessment on approximately 62.43 acres of vacant land in the unincorporated community of Fawnskin, San Bernardino County, California. The subject property of the study, known as Tentative Tract No. 16136 (Moon Camp), is located on the north shore of Big Bear Lake, consisting of a portion of the north half of Section 13, T2N R1W, San Bernardino Base Meridian. The study is part of the environmental review process for the proposed subdivision of the property into single-family residential lots. The County of San Bernardino, as Lead Agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA).

The purpose of the study is to provide the County of San Bernardino with the necessary information and analysis to determine whether the proposed development would potentially disrupt or adversely affect any paleontological resources, as mandated by CEQA, and to design a paleontological salvage program for the project, if necessary. In order to identify any paleontological resource localities that may exist in or near the project area and to assess the possibility for such resources to be encountered in future excavation and construction activities, CRM TECH initiated records searches at the San Bernardino County Museum and the Natural History Museum of Los Angeles County, conducted a literature search, and carried out a field survey of the project area in accordance with the guidelines of the Society of Vertebrate Paleontology.

Based on the results of the records and literature search as well as the field inspection, the proposed project's potential impact on paleontological resources is determined to be *moderate* for Holocene vertebrate fossils on portions of the project area north of SR 38 and greater than five feet in depth. A paleontological resource recovery program for Holocene vertebrate fossils, limited to those areas of potential impact, is therefore recommended for the proposed project.

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INTRODUCTION

In March, 2002, at the request of RBF Consulting, CRM TECH performed a paleontological resource assessment on approximately 62.43 acres of vacant land in the unincorporated community of Fawnskin, San Bernardino County, California (Fig. 1). The subject property of the study, known as Tentative Tract No. 16136 (Moon Camp), is located on the north shore of Big Bear Lake, consisting of a portion of the north half of Section 13, T2N R1W, San Bernardino Base Meridian (Fig. 1). The study is part of the environmental review process for the proposed subdivision of the property into single-family residential lots. The County of San Bernardino, as Lead Agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA; PRC §21000, et seq.).

CRM TECH performed the present study to provide the County of San Bernardino with the necessary information and analysis to determine whether the proposed development would potentially disrupt or adversely affect any paleontological resources, as mandated by CEQA, and to design a paleontological salvage program for the project, if necessary. In order to identify any paleontological resource localities that may exist in or near the project area and to assess the possibility for such resources to be encountered in future excavation and construction activities, CRM TECH initiated records searches at the San Bernardino County Museum and the Natural History Museum of Los Angeles County, conducted a literature search, and carried out a field survey of the project area in accordance with the guidelines of the Society of Vertebrate Paleontology. The following report is a complete account of the methods, results, and final conclusion of the study.

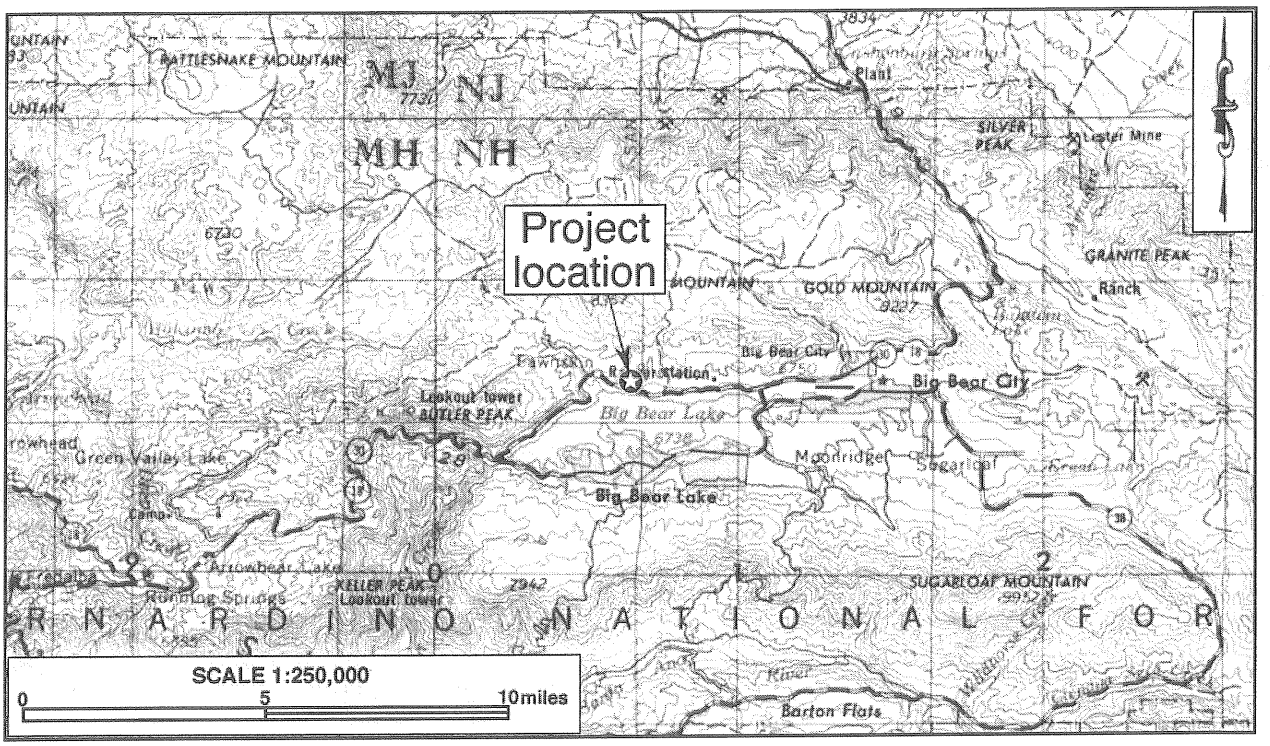

Figure 1. Project vicinity. (Based on USGS San Bernardino, Calif., 1:250,000 quadrangle [USGS 1969])

Figure 2. Project area. (Based on USGS Big Bear Lake and Fawnskin, Calif., 1:24,000 quadrangles [USGS 1994a; 1994b)

SETTING

The project area is located in the San Bernardino Mountains, which comprise a portion of the Transverse Ranges geomorphic province (Jenkins 1980:40-41), the only east-west trending province in the State of California. This portion of the Transverse Ranges province is bounded by the Peninsular Ranges province on the south, the Little San Bernadino Mountain portion of the Transverses Ranges province to the east, the Mojave Desert province on the north, and the San Gabriel Mountain portion of the Transverse Ranges province to the west (*ibid.*).

The project area lies upon the lower slopes of Delmar Mountain, on the north shore of Big Bear Lake. North Shore Drive (SR 38) passes through the property. In aerial photographs taken in 1953, 1965, and 1979, the property is shown to be covered by an open forest with ground commonly visible between the trees (aerial photo 1953; 1965; 1979). The 1965 aerial photograph shows nearby Grout Bay to be a mud flat with a wide, exposed shoreline area along the southern edge of the project area.

The portion of the project area north of SR 38 is wooded to openly wooded, with most of the ground covered by a dense to moderate duff zone composed mainly of pine needles, pine cones, and oak leaves. Surface exposures were limited to roads, steep slopes, canyon bottoms, and a few open meadow-like areas. Large pines, oaks, and cedars make up the bulk of the trees. Also present are a buck brush, pinyon pines, sage, cacti, and grasses. The soil is a gravelly sand with scattered to locally dense areas of cobble or small boulder clasts in the surface float. The clasts are mainly quartzite, with only a few scattered granitic clasts. Based on the soil borings and some road cuts, the surface rocky float is probably the result of lag deposits. In other words, the larger rocks are concentrated at the surface as the smaller materials, such as sand, silt, and clay, are eroded away. This side of the highway contains at least three old dirt roads.

The area south of SR 38 is fenced along the highway, and is accessible through what appears to have been an old, partially graveled driveway. This area has a few scattered large pines, some willows near the shoreline, and is well covered by grasses and weeds. The most open area lies within portions of the access road that are not graveled. The surface soils are a gravelly sand with minor cobble float and only a few scattered small boulders. All but one of the larger rocks are quartzite. Since some buildings are known to have occupied this area in the past, it is possible that the boulders were brought in. The surface level is slightly above the beach during full stands of the lake. Soil borings found that the rock material within the saturated zone is disintegrating, which would suggest that any fossil bone material within this zone would also be disintegrating. The saturated zone should be at or above the lake level, as water tables are usually drawn upward by capillary action to roughly parallel the surface contours of the ground (Pipken and Trent 1997:274).

METHODS AND PROCEDURES

RECORDS SEARCHES

The records search service was provided by the Regional Paleontologic Locality Inventory located at the San Bernardino County Museum in Redlands and the Natural History

Museum of Los Angeles County in Los Angeles. These institutions maintain files of regional paleontological site records as well as supporting maps and documents. The records search results are used to identify previously performed paleontological resource assessments and known paleontological localities near the project area. In addition, a literature search was conducted using materials in the CRM TECH library and the personal library of the author, including unpublished reports produced from surveys of other properties in the vicinity.

FIELD SURVEY

On March 22, 2002, CRM TECH geologist/paleontologist Harry M. Quinn (see App. 1 for qualifications) conducted the field assessment of the project area. The survey was carried out by walking two east-west traverses north of SR 38 spaced approximately 50 meters apart and two east-west traverses south of the highway spaced approximately 10 meter apart. The results of the survey are incorporated into the sections below.

RESULTS AND FINDINGS

EXISTING DATA SUMMARY

The paleontology record searches conducted by the San Bernardino Museum and Natural History Museum of Los Angeles County indicate that no paleontological localities have been discovered within the boundaries of the project area, or within a one mile radius of the project area (Scott 2002; McLeod 2002). However, one paleontological locality, approximately five miles to the east, has been previously reported to have produced vertebrate fossils from sediments that could be present in the deeper levels of the current project area (Scott 2002). Based on the recent nature of the upper sediments, the San Bernardino County Museum assigns the project area a "low potential to contain significant nonrenewable paleontologic resources," and states that "no mitigation program is recommended at this time" (*ibid.*). The Natural History Museum of Los Angeles County concurs that the upper deposits have low sensitivity for paleontological resources, but points out that excavations in the deeper deposits in the portion of the property north of SR 38 "may well encounter significant fossil remains" (McLeod 2002).

REGIONAL GEOLOGY

The San Bernardino Mountains have been uplifted along the southern edge by the San Andreas Fault and by several steeply reverse dipping faults on the north (Bailey and Jahns 1954:105; Trent 1990:1-7). These mountains are composed mainly of gneisses, schists, plutonic rocks, and several kinds of hybrid rocks (Bailey and Jahns 1954:105). They also contain sequences of quartzite and marble from which Paleozoic fossils have been found (*ibid.*). The plutonic rocks are mainly of diorite to quartz monzonite to granite in composition and are considered to be Jurassic and/or Cretaceous in age (*ibid.*). Both the plutonic and metamorphic rocks are intruded by dikes of aplite, pegmatite, lamprophyre, amphibolite, and fine grained basaltic to rhyolitic rocks (*ibid.*). Some Quaternary sedimentary deposits can be found filling canyons and some late Tertiary-Quaternary sedimentary rocks are present along the San Andreas Fault along the south and southwest margins of the range (*ibid.*).

SITE GEOLOGY

Vaughan shows along the north shoreline of Big Bear Lake a strip of Qc, described as the Cabazon fanglomerate of Quaternary age (Vaughan 1922:387-388). It is comprised mainly of an unsorted angular to subangular quartzite-rich fanglomerate (*ibid.*). The rocks just to the north of the fanglomerates are mapped as the Cactus Granite of Jurassic age (Vaughan 1922).

Another geologic map of the surrounding area shows an east-west fault within the bedrock outcrops just north of the project area (Brown 1986:108). The bedrock is mapped as Precambrian metasedimentary rocks, mainly quartzite, marble, and schist (*ibid.*). The rocks between the bedrock and the north shore of Big Bear Lake are shown as Quaternary Alluvium (*ibid.*). Except for the fault, a geologic map by Dibblee (1982:150) shows the same geology for the project area.

A more detailed geologic map of the project area (Sadler 1982:F) shows most of the property to be designated as "aa" and the upper portions as "rf2m." The aa is described as alluvium and colluvium that are considered to be deposits on active surfaces (*ibid.*:A). The rf2m is described as dissected, inactive fan gravels still adjacent to the source, considered to be deposits on relict surfaces (*ibid.*). While the mapping by Sadler (1982:F) shows the rock constituent to be mainly marble, a recent geotechnical study in the same mapped material and near the project area found a large amount of quartzite, rather than marble, to be present (Hulett 2002). The presence of predominantly quartzite rock material within a gravelly sand at this location was confirmed during the field survey. The surface soils appear to become sandier toward the lake.

Portions of Hulett's (2002) geotechnical study, conducted near the project area and within the same mapped rocks, was reviewed for this report. The portions reviewed include three soil borings drilled to depths of 51, 70.5, and 72 feet below grade and three backhoe trenches dug to depths of 12.5, 11, and 13.5 feet below grade. All of these were placed in the rf2m as mapped by Sadler (1982:F) and are in line with the project area. Based of these subsurface data, the area has approximately four to five feet of recent alluvium and colluvium atop some 15 to 20 feet of gray-brown to brown-gray, slightly silty, fine- to coarse-grained sand containing some gravel (Hulett 2002).

The water table was found to be shallow, at 7 to 20 feet, and the rock material within the saturated zone was found to be highly decomposed (Hulett 2002). The ground water zone, as well as the top of the water table, appears to fluctuate with the lake level (*ibid.*). This continued wetting and drying of the rocks material within the ground water zone may be responsible for the noted decomposition of the rock. At depth, all three of these soil borings encountered sandy clays indicative of ponded sediments. These clays suggest that sometime in the geologic past there was a natural lake occupying the portion of the valley where the man-made Big Bear Lake is now located.

Big Bear Lake is a man-made feature that was built by damming up the headwaters of one of the tributaries of the Santa Ana River as it ran through Big Bear Valley. The alluvial deposits that once lined the sides and bottom of the canyon was flooded by the lake, and more recent alluvial deposits began to prograde into the lake. The project area was once on the higher portion of the canyon, in an area of active sedimentation. Such an area

would not be a favorable location for the preservation of vertebrate fossil remains, as any animal dying there would have been subject to carnivore feeding and destruction by the movement of coarse rocky material moving down-slope toward the canyon bottom. The decomposing nature of the rock within the saturated zone would suggest that any fossil material that might have survived within these rocks when they were deposited would have been destroyed along with the rock as they decomposed.

PALEONTOLOGY

The field survey confirmed the presence of recent alluvium on the ground surface. As expected, no fossil remains were found to be present in the project area during the field survey.

DISCUSSION

The field survey results, supported by literature and subsurface testing, indicate that the project area contains sediments deposited during Holocene time. Vertebrate fossils have been found in these same age sediments about five miles east of this location (Scott 2002), however, geologic studies suggest that these vertebrate fossil remains were found in sediments probably associated with a natural Holocene lake (Baldwin Lake) and not in alluvial sediments associated with alluvial fan deposits (Sadler 1982).

As mentioned above, previous geologic studies have recorded sands and some gravels at depths greater than five feet in the area north of SR 38. Based on those findings, and in view of the recent alluvium covering the surface to the depth of five feet and the ground water saturation situation south of the highway, the present study concludes that *there is a moderate potential for the presence of vertebrate fossils within the project area north of SR 38 at depths greater than five feet.*

RECOMMENDATIONS

Based on the study results presented above, the proposed project's potential impact on vertebrate fossils is determined to be *moderate* at depths greater than five feet in the area north of SR 38. Therefore, any earth-moving activities north of the existing highway in excess of five feet below surface grade should be monitored for paleontological resources under a program to mitigate impacts to fossil remains that may be exposed during such operations.

The mitigation program should be consistent with CEQA provisions, as well as with regulations currently implemented by the County of San Bernardino and the proposed guidelines of the Society of Vertebrate Paleontology. The program should include, but not be limited to, the following, as outlined by the San Bernardino County Museum for projects considered likely to have impacts on paleontological resources.

1. Monitoring of grading during excavation in areas identified as likely to contain paleontologic resources by a qualified paleontological monitor. Monitoring should be accomplished for any undisturbed subsurface older alluvium, which might be present in

the subsurface. The monitor should be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments which are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert grading equipment to allow for removal of abundant or large specimens.

2. Preparation of recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.
3. Identification and curation of specimens into a museum repository with permanent retrievable storage.
4. Preparation of a report of findings with an appended itemized inventory of specimens. The report should include pertinent discussion of the significance of all recovered resources where appropriate. The report and inventory when submitted to the appropriate Lead Agency, would signify completion of the program to mitigate impacts to paleontologic resources.

CONCLUSION

CEQA Appendix G provides that "a project may be deemed to have a significant effect on the environment if it will . . . disrupt or adversely affect a . . . paleontological site except as a part of a scientific study." The present study, conducted in compliance with this provision, was designed to identify any significant, non-renewable paleontological resources that may exist within or adjacent to the project area, and to assess the possibility for such resources to be encountered in future excavation and construction activities.

Based on the results of the records and literature search as well as the field inspection, the proposed project's potential impact on paleontological resources is determined to be *moderate* for Holocene vertebrate fossils on portions of the project area north of SR 38 and greater than five feet in depth. A paleontological resource recovery program for Holocene vertebrate fossils, limited to those areas of potential impact, is therefore recommended for the proposed project.

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APPENDIX 1:

PERSONNEL QUALIFICATIONS

PROJECT GEOLOGIST/PALEONTOLOGIST

Harry M. Quinn

Education

1968 M.S., Geology, University of Southern California, Los Angeles, California.
1964 B. S, Geology, Long Beach State College, Long Beach.
1962 A.A., Los Angeles Harbor College, Wilmington North Palm Springs, California.

5. Graduate work oriented toward invertebrate paleontology; M.S. thesis completed as a stratigraphic paleontology project on the Precambrian and Lower Cambrian rocks of Eastern California.

Professional Experience

2000-Present Project/Field Paleontologist, CRM TECH, Riverside, California.
l998-Present Project/Field Archaeologist, CRM TECH, Riverside, California.
1992-1998 Independent Geological/Geoarchaeological/Environmental Consultant, Pinyon Pines, California.
1994-1996 Environmental Geologist, E.C E.S., Inc, Redlands, California.
1988-1992 Project Geologist/Director of Environmental Services, STE, San Bernardino, California.
1987-1988 Senior Geologist, Jirsa Environmental Services, Norco, California.
1986 Consulting Petroleum Geologist, LOCO Exploration, Inc. Aurora, Colorado.
1978-1986 Senior Exploration Geologist, Tenneco Oil E & P, Englewood, Colorado.
1965-1978 Exploration and Development Geologist, Texaco, Inc., Los Angeles, California.

Previous Work Experience in Paleontology

1969-73 Attended Texaco company-wide seminars designed to acquaint all paleontological laboratories with the capability of one another and the procedures of mutual assistance in solving correlation and paleo-environmental reconstruction problems.
1967-1968 Attended Texaco seminars on Carboniferous coral zonation techniques and Carboniferous smaller foraminifera zonation techniques for Alaska and Nevada.
1966-1972, 1974, 1975 Conducted stratigraphic section measuring and field paleontological identification in Alaska for stratigraphic controls. Pursued more detailed fossil identification in the paleontological laboratory to establish closer stratigraphic controls, mainly with Paleozoic and Mesozoic rocks and some Tertiary rocks, including both megafossil and microfossil identification, as well as fossil plant identification.
1965 Conducted stratigraphic section measuring and field paleontological identification in Nevada for stratigraphic controls. Pursued more detailed fossil identification in the paleontological laboratory to establish closer stratigraphic controls, mainly with Paleozoic rocks and some Mesozoic and Tertiary rocks. The Tertiary work included identification of ostracods from the Humboldt and Sheep Pass Formations and vertebrate and plant remains from Miocene alluvial sediments.

Memberships

Society of Vertebrate Paleontology; American Association of Petroleum Geologists; Canadian Society of Petroleum Geologists; Rocky Mountain Association of Geologists, Pacific Section; Society of Economic Paleontologists and Mineralogists; San Bernardino County Museum.

Publications in Geology

Five publications in Geology concerning an oil field study, a ground water and earthquake study, a report on the geology of the Santa Rosa Mountain area, and papers on vertebrate and invertebrate Holocene Lake Cahuilla faunas.

15.8 Geology/Soils Information

D. SCOTT MAGORIEN, C.E.G.
ENGINEERING GEOLOGIST

August 6, 2003

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
Irvine, CA 92619-2027

Subject: ***Revised*** Geology Soils and Seismicity Report
Moon Camp EIR
Fawnskin (Big Bear Lake), California

Dear Mr. Lajoie,

In general accordance with the scope of work presented in my December 19, 2001 proposal and your authorization, the following report presents my revised EIR-level evaluation of the geologic, soils and seismicity aspects for the subject project. The revisions to the November 15, 2002 report are based on edits I received from your office (via email) on August 4, 2003.

As part of this evaluation, a limited subsurface investigation program was performed to assess liquefaction susceptibility of near-shore alluvial sediments, and concerns regarding slope stability and soil erosion. The scope of work for the liquefaction susceptibility study included performing standard penetration testing (SPT) in three (3) rotary- wash borings that were drilled (logged and sampled) in areas suspected to be underlain by potentially liquefaction-prone soils as identified by RGS Geosciences (2001). In order to preliminarily assess the potential for slope instability and soil erosion, seven (7) shallow backhoe pits were excavated (by Shanahan Construction), and geologically logged. The location of the exploratory borings and test pits are presented on Figure 1- Geologic Map. Copies of the boring and test pit logs are presented in Appendix A.

Based on the results of this study, the potential for liquefaction within the limits of the project area is considered low. The major geologic/ geotechnical constraints to development within the property include future strong ground motion associated with nearby earthquakes, potential slope instability on proposed south-facing cut slopes, and erodible soils materials within the two main drainage channels that transect the property. There are no documented active or potentially active faults within or projecting towards the property.

330 W Bay Street, Suite 140, Costa Mesa, CA 92627 • Telephone (949) 642-4438 ext. 3009 • Fax (949) 642-4474

If you have any questions or require additional information, please call.

Sincerely,

D. Scott Magorien, C.E.G. 1290
Principal Engineering Geologist

James J. Weaver, G.E. 884
Vice President and
Principal Geotechnical Engineer
Geomatrix Consultants

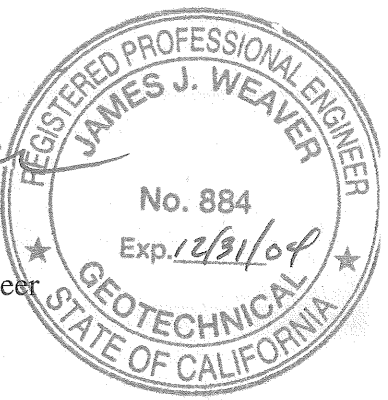

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FIGURE

Figure 1 Geologic Map

APPENDIX

Appendix A Boring and Exploratory Test Pit Logs

GEOLOGY, SOILS AND SEISMICITY
MOON CAMP EIR

1.0 INTRODUCTION

The scope of work performed as part of the geology, soils and seismicity portion for the Moon Camp EIR included the following:

- Compile and review relevant reports and maps that address geotechnical, geologic and hydrogeologic conditions for the project and surrounding area. A list of the reports, maps and other relevant data reviewed for this study are presented in the References section at the end of this report.

- A field investigation for this study that included:

    1. Reconnaissance-level geologic mapping performed on February 26th and June 20th 2002.

    2. Excavation and logging of seven (7) backhoe/test pits on June 20, 2002 to assess near surface soil conditions and bedrock lithology and structure; test pit logs are presented in Appendix A.

    3. Drilling, logging and sampling three (3) exploratory rotary wash borings on June 11 and 12, 2002 for the purpose of assessing the presence of potentially liquefiable soils in the vicinity of the lake. During the drilling, Standard Penetration Tests (SPT) were performed every five (5) feet vertically in the borings, and samples from each test placed in plastic bags for later soil classification. Applicable well drilling permits were obtained from the County prior to actual drilling of each of the borings. The boring logs are presented in Appendix A.

- Various individuals who were believed to have relevant information concerning the geologic and hydrologic conditions in the area were contacted via telephone.

The results of the investigation for this study, as well as pertinent impacts and mitigating measures are provided in the following report.

2.0 EXISTING CONDITIONS

2.1 GEOLOGIC SETTING

The Moon Camp project area is situated within the central portion of the Southern California physiographic province known as the Transverse Ranges Geomorphic Province. This province consists of an east-west trending set of mountain ranges, which include from east to west, San Bernardino, San Gabriel and Santa Inez mountains. This alignment of youthful mountains

owes its existence to ongoing tectonic activity associated with the San Andres Fault system. The geomorphology of the San Bernardino Mountains attests to the youthful nature of this uplifted structural block which is bordered on the north by the North Frontal Fault system and on the south by the San Andreas fault.

Big Bear Valley is one of a series of east-west trending valleys in the eastern San Bernardino Mountains, believed to have formed largely by both high angle and low angle faults in the region. The valley is considered to be a bedrock enclosed basin filled with more than 500 feet of lucustrine and alluvial sediments derived from the surrounding mountainous areas.

Big Bear Lake, which borders the project area on the south, was created by construction of a dam in 1884 across Bear Creek. In 1912, an 80-foot high multiple-arch dam was constructed to replace the lower older dam. In the late 1980s, the Big Bear Lake Dam underwent a seismic retrofit, which included improvement of the foundation conditions beneath the downstream side of the dam. When full, the lake has an area of 2,960 acres, a volume of about 72,200 acre-feet, and a water surface elevation of 6,745 feet.

Topographically, the project area occupies the southernmost margin of a lobe-shaped, south-facing hillside that descends into Big Bear Lake. Natural slopes within the area display surface gradients ranging from 2:1 (horizontal to vertical) along the eastern margin of the site, to about 4:1 within the central and western portions, to more gentle gradients near the shoreline of Big Bear Lake. The highest point within the project area is at an elevation 6,962 feet above mean sea level (msl). Maximum relief between the northern margin of the property and the high water line (i.e. 6,745 feet msl) is approximately 215 feet.

There are two prominent, southerly flowing drainages transecting the project area. Surface gradients within these ephemeral drainage courses average of about 0.08 foot/foot.

The two major geologic units, that comprise the project area include older alluvium of Pliocene-late Miocene age (i.e. 1.5 to 5 million years old), and lesser amounts of Holocene age (present to 11,000 years ago) alluvium that occupies the bottom of the major active stream channels. The older alluvial deposits comprise approximately 90 percent of the project area and extend to the northern shoreline of the Big Bear Lake.

Based on a review of published relevant geologic, geotechnical data, as well as the findings from exploratory drilling, excavation of test pits and reconnaissance-level geologic mapping,

there appears to be only limited geologic hazards on the property as it relates to site development. Possible geologic/geotechnical constraints to proposed residential development include potential instability of large cut slopes, soil erosion within the two major drainages that transect the property, and possible earthquake-induced seiche along the near shore portions of the site. Although the project area is located within the seismically active region of southern California, there are no documented active or potentially active faults transecting or projecting towards the project area.

2.2 GEOLOGIC MATERIALS

Surficial materials within the site consist of topsoil, slopewash materials and recent stream-laid alluvial deposits within the active stream channels. Older alluvial deposits underlie the entire site at relatively shallow depths. The distribution of the more significant deposits is shown on Figure 1 (Geologic Map). The designations shown below, in parenthesis, correspond to those shown on the Geologic Map.

Topsoil (not designated on Geologic Map)

Native topsoil which blankets much of the site consists mainly of sandy loam with angular gravel-to cobble-size fragments of quartzite derived from older bedrock formations. These soils are typically dry, porous, and loose, contain varying amounts of organic material, and range in thickness from about eight to ten inches. These soils are considered to be moderately erodible in their natural condition and considered too gravelly and cobbley for use as topsoil for landscaping.

Slopewash (Qsw)

Slopewash deposits consist of the downslope accumulation of eroded topsoil and sediments derived from the underlying older alluvial materials. Slopewash typically contains abundant organic debris and is considered moderately to highly compressible.

Slopewash occurs within broad drainage swales, and as widespread blanket deposits on the gentler, natural slope in the south central portion of the area. The compositions of these soil-like deposits reflect the composition of the older alluvial soils from which they are derived. Where observed in the exploratory test pits, slopewash deposits consist largely of an admixture of silty sand, angular gravel to cobble-size fragments of hard, crystalline bedrock. These soils range in thickness from one to four and a half feet, and are commonly dark brown to dark yellowish-brown in color, loose to medium dense, dry to slightly moist, porous, and contain

varying amounts of roots and rootlets, and considered low to moderately compressible. Erodibility in their natural state is considered to be slight to moderate.

Alluvium (Qal)

Alluvial deposits occupy the bottom of two major and one minor drainage channels that transect the project area (see Geologic Map). These Holocene age, soil-like materials have been deposited, eroded and re-deposited by intermittently flowing streams within these drainages. Where encountered in exploratory borings B-2 and B-3, and exploratory test pit TP-7, these soils consist of crudely stratified layers and lenses of silty sand with varying amounts of angular gravel to cobble-size fragments of quartzite and marble. The alluvial soils are dark brown to dark yellowish-brown in color, comprised of fine to medium grain sand, dry to slightly moist, loose and moderately porous and contain numerous roots and rootlets. Where noted in the two borings and the test pit, the thickness of the alluvial soils in the study area ranges from about 3.5 to 17 feet (±). Exploratory boring B-1 encountered only surficial slopewash-type deposits (as described above).

Prior to this investigation, RGS Geosciences' (2001) geologic feasibility study indicated that these alluvial soils near the shoreline of Big Bear Lake are potentially susceptible to seismically-induced liquefaction. Each of these drainages was targeted, as close to the shoreline as considered practical, for exploratory drilling and standard penetration testing (SPT) testing in three (3) exploratory borings. These borings have been designated B-1, B-2 and B-3, the locations of which are shown on the Geologic Map.

The primary approach used in this study to assess liquefaction potential of the alluvial soils was based on an empirically based approach as presented by Seed and Idriss (1982). For this approach, SPT blowcounts (e.g. drive energy of a 140 pound weight falling a distance of 18 inches), as well as other seismic and overburden pressures at the point(s) of interest are needed for the assessment. For this study, SPT blowcounts were obtained at about five intervals in each of the three rotary-wash borings.

Based on the results of the SPT and visual observations of the soil samples, the recent (i.e. Holocene age) alluvial soils below a depth of approximately eight feet are not considered prone to settlement or seismically-induced liquefaction. The upper eight feet are considered moderately compressible, and are highly erodible. Given the gravelly/cobbley nature of the near surface alluvium, and the relative elevation as it relates to high water level in the lake

(elevation 6,745 feet msl), the likelihood of seismically induced liquefaction of these sediments along, or inland, of the lake front is considered remote.

Older Alluvium (Toa_s Toa_p)

The entire project area is underlain to significant depths (greater than 400 feet) by what is referred to as Older Alluvium of Plio-Miocene age (as identified by Miller, et. al., 2001). These ancient deposits represent what remains of an extensive accumulation of alluvial (stream-laid) soil materials that had been eroded from adjacent bedrock highlands north of the project area. According to geologic mapping by the U.S. Geologic Survey (Miller, 2001), these alluvial deposits rest unconformably above granitic bedrock of Cretaceous age. Although well dissected, these deposits form an increasingly thickening wedge from north to south. According to water well logs (Geoscience Support Services, Inc., 2000), these sediments are over 400 feet thick near the shoreline and serve as the principal groundwater reservoir beneath the site.

Exposures of the older alluvial deposits are limited to small areas on the road cuts along Highway 38, and on several 12- to 18-foot high road cuts on Polique Canyon Road that leads in Holcomb Valley. No evidence of significant surficial or gross instability was observed either within the project area or along the roadway cuts. Many of these road cuts were quite steep, having inclinations exceeding 45°. However, the lower portions of these cut slopes were commonly covered with a talus apron displaying an inclination of about 33°.

In order to evaluate the near-surface lithologic makeup and bedding plane structure of these sedimentary deposits for the purpose of preliminarily assessing slope stability issues, six (6) exploratory backhoe pits were excavated within the property using a rubber-tired, Case 580 extend-a-hoe equipped with a 3 foot wide bucket. Each of the pits was situated within an area characterized by a certain type of topographic terrain and/or near a proposed cut slope, and varied in depth from about two to six feet below ground surface. All the pits were geologically logged and backfilled with the excavated materials. The location of each pit is shown on the Geologic Map.

The main lithologic character of these ancient soils is represented by layers of clayey sand (labeled Toa_s on the Geologic Map) that contains varying amounts (up to about 10%) of angular, gravel to cobble-size fragments of quartzite derived from older bedrock that now forms discontinuous exposures along the ridgeline to the north of the project area. These older alluvial soils are commonly dark yellowish-brown to strong brown in color, are very dense (i.e.

over-consolidated), contain medium to coarse-grained sand particles, and are thinly to thickly bedded. Based on observations within exploratory test pit excavations, these soils were difficult to excavate below a depth of several feet.

Near the north-central portion of the study area the older alluvium is represented by fanglomerate-type deposits. These materials labeled (Toa_f on the Geologic Map) represent the eroded remnants of an ancient alluvial fan, consisting largely of angular to subangular cobble to gravel size quartzite fragments with about 30% silty sand. Similarly to the underlying clayey sand deposits, the fanglomerate is light brownish-yellow, dense, and is difficult to excavate past a depth of about 3 feet. These deposits appear to have limited areal extent, and form a relatively thin veneer atop the more extensive, older clayey sand (Toa_s) deposits.

Overall, there does not appear to be any major geotechnical-related constraints associated with the older alluvial deposits, except perhaps where clay deposits prove to be moderately or highly expansive and where significant cut slopes are planned, as discussed below.

2.3 GEOLOGIC STRUCTURE

The geologic structure within the project area is defined by the orientation of bedding planes within the older alluvium (Toa_s). Where observed in the exploratory test pits TP-2 and TP-5, located within the northern portion of the study area, bedding planes exposed near the bottom of each pit varied in strike between North 65°West (N65W), and east-west (EW), and dip to the south-southwest at 10° and 18°. In test pit TP-1, located near the shoreline of Big Bear Lake, bedding within the older alluvium appeared to be essentially horizontal. If these bedding plane attitudes are representative of the upland and shoreline areas of the project site, it would appear that the older alluvium has been folded into a roughly east-west- trending synclinal fold, the southern limb of which has been eroded away during the formation of Bear Valley. If true, this folding is judged to have occurred over a period of hundreds of thousands of years as a result of San Andreas tectonics. Conversely, this apparent variation in the dip of bedding planes could be a result of ancient faulting associated with uplift of the San Bernardino Mountains. However, no evidence of faulting, active or otherwise, has been documented within or adjacent to the project area.

If the bedding planes observed in the exploratory test pits are representative of the orientation of bedding within upland areas of the site, south-facing cut slopes associated with construction for the new alignment for State Highway 38, as well as internal streets north of the new highway, could present concerns related to slope stability. If bedding planes near the shoreline

area, south of realigned State Highway 38, are essentially horizontal (as depicted in test pit TP-1), gross slope stability problems would not be anticipated. However, where significant cut slopes are planned, a site-specific subsurface investigation should be performed in order to evaluate the nature and extent of bedding planes and the presence of any weak clay layers.

2.4 GROUNDWATER

The eastern two-thirds of the project area lie within what is known, hydrologically, as the North Shore Sub area of Big Bear Lake. The western one-third lies within the Great Creek Sub area. According to Brown (1976; *in* AEG Annual Spring Field Trip Guidebook) the North Shore Sub area is similar in several respects to the Great Creek Sub area; a considerable amount of the water bearing (older alluvial) materials present is above the known groundwater surface. Only a band of these materials adjacent to Big Bear Lake are continuously saturated (Brown, 1976).

According to a recent geohydrologic investigation of the Moon Camp Area by Geoscience Support Services (GSS, 2000), the older alluvial deposits represent the main water-bearing formation beneath the site. Groundwater-level data from two U.S. Forest Service wells located within the project area suggest that Big Bear Lake provides recharge to the aquifer beneath the project area. Additional groundwater recharge emanates from gravity drainage from the higher elevations north of the Moon Camp area.

Based on the studies by GSS (2000), the main water-bearing zones within the older alluvial deposits consist of intermixed and interlayered sand and gravels. However, lithologic data from the two U.S. Forest Service wells indicate that these sand and gravel aquifers are not continuous over wide areas and tend to follow subsurface channels (GSS, 2000). In mid 2000 groundwater beneath the southern margin of the site was about 5 to 10 feet below the level in the lake. More recent groundwater level observations from the three exploratory borings drilled for the liquefaction analysis appears to be similar with respect to the level of the lake.

The results from GSS's (2000) geohydrologic investigation indicate the recoverable amount of groundwater in the Moon Camp area is estimated at 230 acre-feet per year. Based on the nature of the aquifer materials, thickness of the aquifer and the discharge rate of existing wells in the Moon Camp area, the potential to develop a 100 gallon per minute (gpm) water well supply is considered by GSS (2000) to be good. Chemical analyses of the groundwater from the two wells indicates that the groundwater is of superior quality, except for one well where the iron concentration (0.69 mg/l) exceeds the state maximum concentration limit for iron (0.3 mg/l) (GSS, 2000).

According to a hydrologic report by So & Associates Engineers, Inc. (SAE) (2002), the proposed project requires two new wells designed in accordance with Big Bear Lake Department of Water and Power (DWP) standards, and be capable of delivering a minimum of 72.0 gallons per minute. However, it has been reported by GSS (2000) that at least one of the existing on-site wells was constructed in accordance with DWP standards and capable of producing 100 gpm.

In order to assess the amount of recoverable water, the likely interconnection of the aquifer with Big Bear Lake, and the sustained yield of the aquifer, pump testing of at least one, or both, of the two existing wells will be required by DWP.

No individual private irrigation wells will be permitted within the proposed tract (SAE, 2002).

2.5 MINERAL RESOURCES

There are no economic metallic or non-metallic ore deposits within or directly adjacent to the project area. The potential for oil and/or gas deposits beneath the site is considered remote.

3.0 GEOLOGIC HAZARDS

General

The primary geologic hazards within the project area are those associated with possible slope instability for new slopes, soil erosion, strong ground motion from earthquakes, and potential seiche along the shoreline.

The project area is not situated within the County of San Bernardino Geologic Hazard (GH) Overlay District. For informational purposes only, the GH Overlay District was created to provide greater safety by establishing review procedures and setbacks for areas that are subject to potential geologic problems such as ground shaking, earthquake faults, liquefaction and subsidence.

3.1 FAULTING AND SEISMICITY

Hazards associated with earthquakes include primary hazards, such as ground shaking and surface rupture; and secondary hazards, such as liquefaction, seismically-induced settlement, landsliding, tsunamis, and seiches.

In accordance with the California Department of Conservation Division of Mines and Geology, a fault is a fracture in the crust of the earth along which rocks on one side have moved relative

to those on the other side. Most faults are the result of repeated displacements over a long period of time. An inactive fault is a fault that has not experienced earthquake activity within the last three million years. In comparison, an active fault is one which has experienced earthquake activity in the past 11,000 years. A fault which has moved within the last two to three million years, but not proven by direct evidence to have moved within the last 11,000 years, is considered potentially active. No active or potentially active faults are located within or project towards the project area.

The project area, like most of Southern California is part of a seismically active region. The Alquist-Priolo Act of 1972 (now the Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code 2621-2624, Division 2 Chapter 7.5) regulates development near active faults so as to mitigate the hazard of surface fault-rupture. Under the Act, the State Geologist is required to delineate "special study zones along known active faults in California". The Act also requires that, prior to approval of a project, a geologic study be conducted to define and delineate any hazards from surface rupture. A geologist registered by the State of California, within or retained by the lead agency for the project must prepare this geologic report. A 50-foot setback from any known trace of an active fault is required. The project area is not currently known to be located within an Alquist-Priolo Fault Rupture Hazard Zone, according to the California Division of Mines and Geology.

The Modified Mercalli intensity scale was developed in 1931 and measures the intensity of an earthquake's effects in a given locality, and is perhaps much more meaningful to the layman because it is based on actual observations of earthquake effects at specific places. On the Modified Mercalli intensity scale, values range from I to XII. The most commonly used adaptation covers the range of intensity from the conditions of "I –not felt except by very few, favorably situate," to "XII – damage total, lines of sight disturbed, objects thrown into the air". While an earthquake has only one magnitude, it can have many intensities, which decrease with distance from the epicenter.

Ground motions, on the other hand, are often measured in percentage of gravity (percent g), where g = 32 feet per second per second (980 cm/sec^2) on the earth.

Ground shaking accompanying earthquakes on nearby faults can be expected to be felt within the project site. However, the intensity of ground shaking would depend upon the magnitude of the earthquake, the distance to the epicenter, and the geology of the area between the epicenter and the property.

A listing of active faults considered capable of producing strong ground motion at the site, their distances from the project site, and the maximum expected earthquake along each fault is presented in Table 1. Also presented are generalized evaluations of maximum ground shaking on site for the maximum earthquakes, and generalized predictions of the likelihood of such events occurring.

TABLE 1

SUMMARY OF FAULT AND GENERALIZED EARTHQUAKE INFORMATION FOR THE MOON CAMP PROJECT SITE

Name	Miles(direction from site)	Maximum Magnitude	Expected Level of Ground Shaking	Likelihood
North Frontal (Western Segment)	6.5 (north)	7.0	High	Moderate
Helendale	8.0 (east)	7.3	High	Moderate
San Andreas	14 (south)	7.3	High	High
Pinto Mountain	18 (southeast)	7.0	Moderate	Moderate
San Jacinto	25 (southwest)	6.7	Moderate	High

The most severe ground shaking would be expected to accompany a large earthquake on the North Frontal Fault. An earthquake magnitude of 7.0 on this fault could produce Modified Mercallli intensities in the range of VIII to X within the property, and a maximum horizontal ground acceleration between 0.6 and 1.22 (Hilltop Geotechnical 2001). Damage from ground rupture on-site is extremely unlikely because no known active faults cross the property.

Secondary earthquake hazards, which include liquefaction, ground lurching, lateral spreading, seismically induced settlement, tsunamis, and earthquake induced landsliding, are discussed in the following sections.

Liquefaction

Seismic ground shaking of relatively loose, granular soils that are saturated or submerged can cause the soils to liquefy and temporarily behave as a dense fluid. Liquefaction is caused by a sudden temporary increase in pore water pressure due to seismic densification or other displacement of submerged granular soils. Liquefaction more often occurs in earthquake prone areas underlain by young alluvium where the groundwater table is higher than 50 feet below the ground surface. The borings for this EIR were drilled in accordance with the "Guidelines for Evaluating and Mitigating Seismic Hazards in California, 1997" published by the Division of Mines and Geology (DMG) of the Department of Conservation. These guidelines are otherwise known as SP 117 (Special Publication 117). Our procedures for analyzing liquefaction potential at the site conform to the "Recommended Procedures for Implementation of DMG Special Publication 117" produced by the Southern California Earthquake Center (SCEC) in 1999. As mentioned in the introduction section of this report, rotary wash drilling techniques were used to advance the borings for this project and Standard Penetration Tests (SPTs) were conducted in general accordance with ASTM D1586. A standard sampler driven by automatic hammer was used to perform the SPTs. Previous measurements by the drilling company rated the hammer energy at 75 to 80 percent. The SCEC recommends the use of the 1985 simplified procedures by Seed and others to analyze liquefaction potential. Typically, the methodology is to determine a corrected blowcount $(N_1)_{60}$and use a recommended relationship between the corrected SPT blow count and the equivalent uniform cyclic stress ratio necessary to trigger liquefaction during a 7½-magnitude earthquake. The graphical summary of this relationship shows that for $(N_1)_{60}$ greater than 30, the potential for earthquake-induced liquefaction is practically non existent. Field SPT values were corrected for sampler type, drill rod lengths, hammer type and release system, and overburden stresses to generate the corrected value $(N_1)_{60}$.

SPT data for this project show generally high blowcount. Consequently, corrected SPT blowcounts yielded $(N_1)_{60}$ values that were greater than 30. Based on the results of the SPT data obtained from the exploratory borings, as well as observations within the exploratory test pits, there are no conditions within the project area that could promote liquefaction. Although shallow groundwater is present beneath the shoreline portions of the property, the lithologic

character of the older alluvial materials that underlie the entire shoreline area of the project is such that the potential for liquefaction is considered remote.

The only possible exception could be very small areas directly at the lake-shoreline interface and the mouth of the major alluvial channels. However, only one of these areas lies within the project area (refer to Geologic Map). Given the nature of the lithologic conditions and high SPT blowcounts encountered in exploratory boring B-3 near the mouth of this channel, the lateral extent of any loose, saturated alluvial soils would be very limited. The likelihood of liquefaction-induced impacts in this area is considered low.

Ground Lurching

Certain soils have been observed to move in a wave-like manner in response to intense seismic ground shaking, forming ridges or cracks on the ground surface. Areas underlain by thick accumulations of colluvium and alluvium appear to be more susceptible to ground lurching than bedrock. Under strong seismic ground motion conditions, lurching can be expected within loose, cohesionless solids, or in clay-rich soils with high moisture content. Generally, only lightly loaded structures such as pavement, fences, pipelines and walkways are damaged by ground lurching; more heavily loaded structures appear to resist such deformation. Ground lurching may occur where deposits of loose alluvium exist on the project site, such as within the two major alluviated channels that transect the project area (see Geologic Map).

Lateral Spreading

Lateral spreading involves the lateral displacement of surficial blocks of sediment as a result of liquefaction in a subsurface layer. As previously stated the liquefaction potential within the project area, however, is considered to be remote.

Seismically Induced Ground Settlement

Strong ground shaking can cause settlement by allowing sediment particles to become more tightly packed, thereby reducing pore space. Unconsolidated, loosely packed alluvial deposits are especially susceptible to this phenomenon. Poorly compacted artificial fills may also experience seismically induced settlement. Unconsolidated soils such as modern alluvial soils within the two active stream channels are subject to seismically induced ground settlement.

Tsunamis

A tsunami is a seismic sea-wave caused by sea-bottom deformations that are associated with earthquakes beneath the ocean floor. The hazard from tsunamis is considered nonexistent, given the large distance from the Pacific Ocean.

Seiching

Seiching involves an enclosed body of water oscillating due to groundshaking, usually following an earthquake. Lakes and water towers are typical bodies of water affected by seiching. Because of the proximity of the subject site to Big Bear Lake, the site is susceptible to damage from seiching. The largest amplitude of ground motion associated with a seismic event in this area is anticipated to be related to a major earthquake along the North Frontal Fault zone.

Other Geologic Hazards

Landslides

No landslides are known to exist within the upgradient of the site. Field reconnaissance did not disclose the presence of older, existing landslides within or near the subject property. Aerial photographic analyses performed as part of this study also did not disclose any existing landslides or slumps in the project area.

4.0 THRESHOLDS OF SIGNIFICANCE

Earth resource and/or topographic impact resulting from the proposed project could be considered significant if any of the following occur:

- exposure of people or property to substantial geological hazards, such as landslides, mudslides, ground failure or similar hazards, or soil and/or seismic conditions so unfavorable that they could not be overcome by design using reasonable construction and/or maintenance practices;
- location of a structure within a mapped hazard area or within a structural setback zone;
- location of a structure within an Alquist-Priolo Fault-Rupture Hazard Zone, or within a known active fault zone, or an area characterized by surface rupture that might be related to a fault;
- triggering or acceleration of geologic processes, such as landslides or erosion that could result in slope failure;

- substantial irreversible disturbance of the soil materials at the site or adjacent sites, such that their use is compromised;
- modification of the surface soils such that abnormal amounts of windborne or waterborne soils are removed from the site;
- earthquake induced ground shaking capable of causing ground rupture, liquefaction, settlement, or surface cracks resulting in the substantial damage to people and/or property;
- deformation of foundations by expansive soils (those characterized by shrink/swell potential); and
- modification of the on-site (i.e., grading) in a manner that results in decreased stability for adjacent residential enclaves.

5.0 IMPACTS

The level of geotechnical and landform information contained herein is adequate to analyze the potential project effects on earth resources and landforms, and to determine appropriate mitigation measures. For certain items, the project geotechnical engineer should perform further testing and review of on-site conditions as part of the final design work. This additional work will further refine details for site design, but is not anticipated to alter the conclusions of significance contained herein. In accordance with CEQA case law, this later additional refinement is not a deferral of mitigation. Rather, it is a design refinement, consistent with the commitment to mitigation included in this EIR.

According to the County's RFP, the project proposes a 95-lot residential subdivision on the north shore of Big Bear Lake, in the community of Fawnskin, in the County of San Bernardino. The project site consists of approximately 62.43 acres in the north ½ of Section 13, Township 2 North, Range 1 West, San Bernardino Base Meridian. The Applicant proposes 92 numbered and 3 lettered lots. The lots are to be sold individually and development of lots and construction of homes will be by custom design. Numbered lots will range in size from 0.17 to 2.11 acres. Highway 38 will be realigned as part of the project. Furthermore, development will likely require a remedial grading plan.

The conceptual grading plan prepared by Hicks and Hartwick, Inc. (dated 6/6/01) indicates the creation of numerous, southerly-facing, 2:1 (horizontal to vertical) cut and fill slopes adjacent to the realigned portion of State Highway 38 and the two (2) roadways internal to the development. Based on the nature of bedding planes observed within the older alluvial deposits in test pits TP-2 and TP-5, southerly-facing cut slopes north of the realigned section of

State Highway 38 may be grossly unstable. If so, the lots adjacent to these cut slopes could be significantly impacted.

There are also a number of other short- and long-term impacts to the current physical/geological setting that can be generally expected from grading and development activities. These are described in the following impacts sections.

5.1 Effects Found Not To Be Significant

Liquefaction

Based on the results of the data obtained from the exploratory borings and test pits, liquefaction is not considered to be a significant impact due to its low potential within the project site.

5.2 Potentially Significant Impacts

The most significant potential impacts to site development would be caused by changes in existing topography, erosion of surficial soil deposits, ground shaking from nearby seismic sources, and potential seiche along the shoreline properties. Impacts to the existing groundwater conditions beneath the site may include increased amounts of recharge to the underlying aquifer(s) as a result of widespread landscape irrigation or leaky buried water transmission lines. If groundwater from onsite wells is to provide the water supply to the project area, additional studies will be necessary to assess the impacts to the underlying aquifer as a result of groundwater withdrawals. In any event, no significant impact to groundwater quality is anticipated.

5.2.1 Slope Stability

Given the apparent southerly inclination of bedding planes within the older alluvial deposits, south-facing, manufactured cut slopes could be grossly unstable. If weak clay layers within the older alluvium were found to be dipping out-of-slope, in what is referred to as "daylighted bedding", slope failures could occur and encroach into adjacent lots.

The most proven methods to mitigate such conditions would be to construct 2:1 (horizontal to vertical) buttressed slopes using on-site native soil materials, or constructing geotextile-reinforced soil buttresses where cut slopes are planned. Either of these methods, as well as a number of other forms of proven slope reinforcement methods would reduce this impact to a less-than-significant level.

5.2.2 Soil Erosion

The younger alluvial deposits within the two major stream channels are highly erodible. Adverse surface drainage could promote accelerated soil erosion which could undermine proposed structures and lead to increased sedimentation within Big Bear Lake. This impact would be considered significant if not mitigated.

Mitigation measures, such as the removal and recompaction of these soils, providing adequate surface drainage away from these soils, or covering them with a roadway would reduce this impact to a less-than-significant-level.

5.2.3 Ground Shaking

Given the highly seismic character of the Southern California Region, moderate to severe ground shaking can be expected within the project area due to moderate to large earthquakes on the nearby North Frontal, Helendale, or San Andreas fault zones. This impact would be considered significant if not mitigated. In order to reduce this impact a less-than-significant-level, all structures for human occupancy should be constructed in accordance with seismic design standards set forth in the latest edition of the Uniform Building Code.

5.2.4 Seiche

Seiche-induced run up along the shoreline properties adjacent Big Bear Lake could conceivably occur due to significant ground motion from a major earthquake on nearby faults. The amount of potential run up would be dependant on the slope of the near-shore environment (i.e. shoreline angle), the height of the lake level at the time of the seismic event, and the severity of oscillation of seismically-induced waves.

Prior to development, an adequate evaluation of seiche needs to be completed by the project geotechnical engineer.

5.3 Construction Related Impacts

Grading activities within the project area would create significant changes to the current landforms/topography. The greatest changes to existing topography would occur where grading of slopes and associated interior streets and the realignment of Highway 38 is planned. Only by avoidance can impacts to topography related to grading be mitigated and/or reduced to a less-than-significant level.

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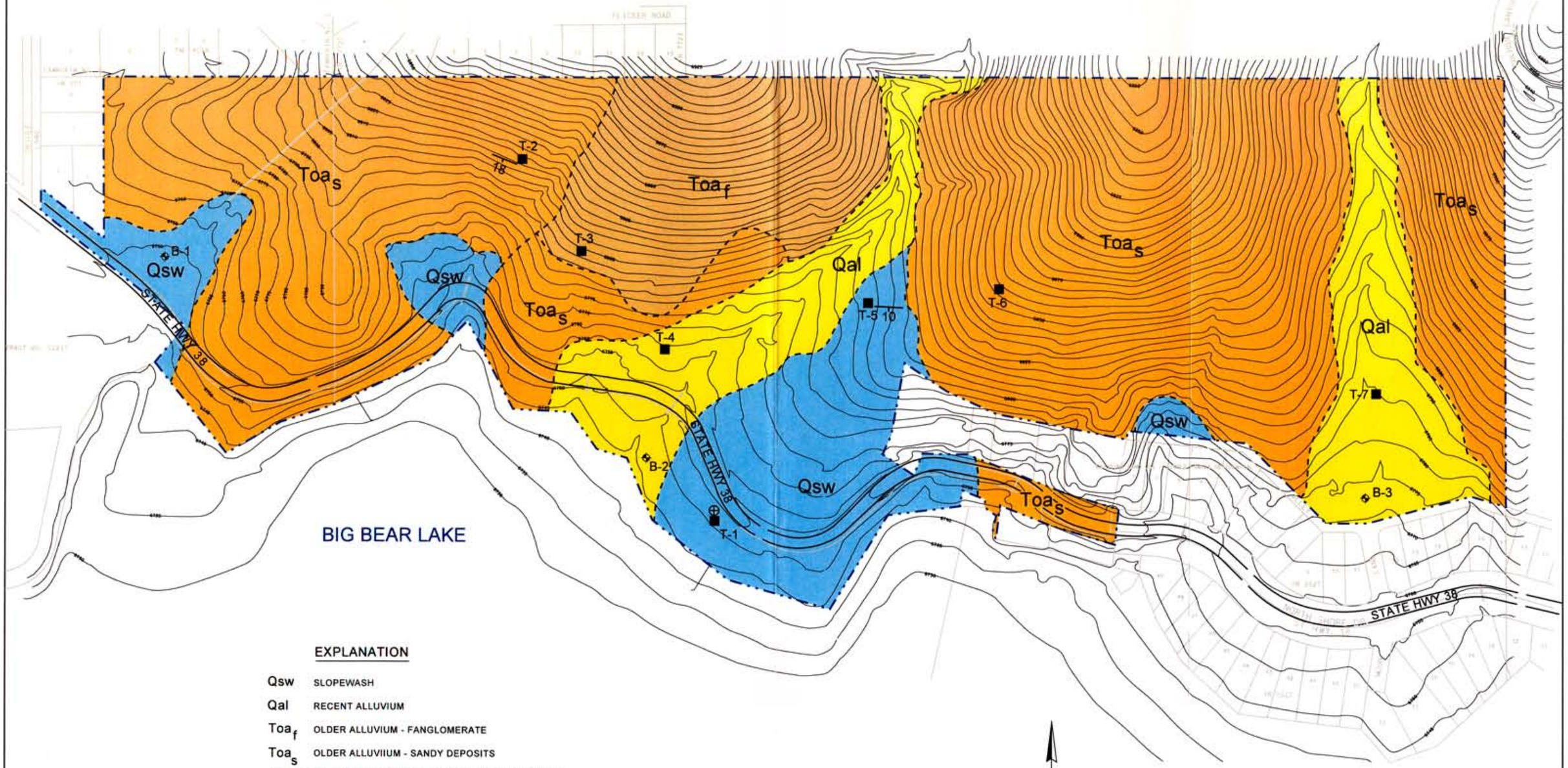
AERIAL PHOTOGRAPH

Flight Identifier	Date	Flight Frame No.	Scale
USDA	6/29/89	AXL-17F-103, 104	1"=2000'



EXPLANATION

Qsw	SLOPEWASH
Qal	RECENT ALLUVIUM
Toa$_f$	OLDER ALLUVIUM - FANGLOMERATE
Toa$_s$	OLDER ALLUVIIUM - SANDY DEPOSITS
B-3 ⊕	EXPLORATORY BORING, APPROXIMATELY LOCATED
T-7 ■	EXPLORATORY TEST PIT, APPROXIMATELY LOCATED
— –	GEOLOGIC CONTACT, DASHED WHERE APPROXIMATE
18	STRIKE AND DIP OF BEDDING
⊕	POSSIBLE HORIZONTAL BEDDING
— · · —	SITE BOUNDARY

N

0 160 220

APPROXIMATE SCALE IN FEET

BASEMAP MODIFIED FROM TOPOGRAPHIC BASE MAP
DRAWING PROVIDED BY HICKS & HARTWICK, INC., SEPTEMBER 2000

GEOLOGIC MAP
MOON CAMP EIR
Fawnskin, California

D. Scott Magorien, C.E.G. 1290
Consulting Engineering Geologist

Figure By	Project No.	Figure
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Date 08/06/03		

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APPENDIX A

BORING AND EXPLORATORY TEST PIT LOGS

MOON CAMP

EXPLORATORY TEST PIT LOGS*

TEST PIT NO.	DEPTH	LITHOLOGIC DESCRIPTION
TP-1	0 - 3.5'	*Slopewash*: Gravel and Cobbles (GP) in silty sand matrix, dark brown (10YR 3/3), 30% fine to medium sand, dry, nonplastic, loose to medium dense, porous, roots and rootlets in uppermost foot.
	3.5 - 6'	*Older Alluvium*: Clayey Sand (SC), yellowish brown (10YR 4/4), 90%fine and 10 % medium-grained sand, moist, dense, non porous thinly bedded, low plasticity.
TP-2	0 - 1.5'	*Slopewash*: Silty Sand (SM) w/ Gravel and cobbles, dark yellowish brown (10 YR 3/3), 30% fine to medium sand, dry, nonplastic, loose , porous, abundant roots .
	1.5 - 6'	*Older Alluvium*: Clayey Sand (SC), yellowish brown (10YR 4/6), 50% fine and 50 % medium to coarse -grained sand, occasional grussified granite clast, moist, dense, non porous, thinly bedded, low plasticity. Possible Bedding: N65W, 18SW. (Excavating difficult past 4.5')
TP-3	0 - 1.5'	*Slopewash*: Gravel and Cobbles (GP) in silty sand matrix (15%), dark brown (10YR 3/3), dry, nonplastic, loose to medium dense, porous, roots and rootlets.
	1.5 - 4'	*Older Alluvium (Fanglomerate)*: Cobbles (70%) and Gravel (30%) w/ silty sand matrix (30%), light brownish yellow (10YR 6/4, dense, moist, mainly angular quartzite clasts up to 1 foot in maximum dimension. (Excavating difficult past 3').
TP-4	0 - 3.5'	*Alluvium*: Silty Sand (SM) w/ scattered gravel (5%), fine to medium grained, dark yellowish brown (10YR 4/4), loose, dry, nonplastic loose to medium dense, porous, roots and rootlets throughout, highly erodible.
	3.5 - 4.5	*Slopewash*: Silty Sand (SM) w/ Gravel (10%) and Cobbles(90%), mainly fine-grained sand, dark yellowish brown (10YR 4/4), medium dense, dry to slightly moist, porous.

EXPLORATORY TEST PIT LOGS (con't)

	4.5 - 7.0	*Older Alluvium*: Clayey Sand (SC) w/ 10% quartzite cobbles, strong brown (7.5YR 4/6), 70% fine and 30 % medium to coarse - grained sand, moist, dense, non porous, low plasticity.

TEST PIT NO.	DEPTH	LITHOLOGIC DESCRIPTION
TP-5	0 - 1.5'	*Slopewash:* Silty Sand (SM) w/ angular Gravel (40%) and Cobbles (60%), mainly fine-grained sand and quartzite clasts , dark yellowish brown (10YR 4/4), medium dense, dry to slightly moist, porous, roots and rootlets.
	1.5 - 4.5	*Slopewash*: Sandy Silt (SM) w/ trace gravel, fine grained, strong brown (7.5 YR 5/6) loose to medium dense, slightly moist, porous, scattered rootlets.
	4.5 - 6.5	*Older Alluvium*: Clayey Sand (SC), yellowish brown (10YR 4/6), 50% fine and 50 % medium to coarse -grained sand, moist, dense, non porous, thinly bedded, low plasticity. Possible Bedding: EW, 10S. (Excavating difficult past 5.5')
TP-6	0 -4'	*Older Alluvium*: Clayey Sand (SC), yellowish brown (10YR 4/6), 70% fine and 30 % medium to coarse -grained sand, moist, dense, non porous, thinly bedded, low plasticity. (Excavating difficult past 3.0').
TP-7	0 - 7.5'	*Alluvium:* Silty Sand (SM) w/ gravel and scattered cobbles of quartzite, strong brown (7.5 YR 4/6), fine to medium sand, dry to slightly moist, loose, moderately porous, numerous root and rootlets to 6'.

* Refer to Figure 1 – Geologic Map for Location of Test Pits

MAJOR DIVISIONS		LTR	DESCRIPTION	MAJOR DIVISIONS		LTR	DESCRIPTION
COARSE GRAINED SOILS	GRAVEL	GW	Well-graded gravels or gravel-sand mixtures, little or no fines	FINE GRAINED SOILS	SILTS AND CLAYS LL<50	ML	Inorganic silts and very fine sand, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity
		GP	Poorly-graded gravels or gravel-sand mixture, little or no fines			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		GM	Silty gravels, gravel-sand-silt mixtures			OL	Organic silts and organic silt-clays of low plasticity
		GC	Clayey gravels, gravel-sand-clay mixtures		SILTS AND CLAYS LL>50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	SAND	SW	Well-graded sands or sand with gravel, little or no fines			CH	Inorganic clays of hogh plasticity, fat clays
		SP	Poorly-graded sands or sand with gravel, little or no fines			OH	Organic clays of medium to high plasticity
		SM	Silty sands, sand-silt mixtures	HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils
		SC	Clayey sands, sand-clay mixtures				

SAMPLE COLUMN SYMBOLS

- Standard penetration test (SPT) Sample: 1 3/8-inch I.D. with liners
- California Split Spoon Sample: 2-inch I.D. with liners
- Modified California Split Spoon Sample: 2 1/2-inch I.D. with liners
- Sample Interval
- Piston Sample
- Continuous soil or rock core
- NR No recovery

BLOWS/FOOT - Summation of blow counts for deepest 12 inches is sampling interval
RQD% - Rock quality destination in percent

DESCRIPTION COLUMN SYMBOLS

- --- Dashed lines separating soil strata represent inferred boundaries between sampled intervals or no recovery intervals and may be distinct or gradual transitions
- —— Solid lines represent distinct or gradual boundaries observed within sampled intervals
- Description right of bracket symbol represents soil conditions within the depth interval defined by the bracket length
- Description right of arrow symbol represents soil conditions to the next deeper boundary line unless otherwise noted
- Water level at time of drilling
- Water level after at least 12 hours from time of drilling

LABORATORY TEST ABBREVIATIONS

ATT	Atterberg Limits	CORR	Corrosion	SE	Sand Equivalent
COLL	Collapse Potential	DS	Direct Shear	SG	Specific Gravity
COMP	Compaction	EI	Expansion Index	TX	Triaxial Test
CON	Consolidation	S	Grain Size Analysis	UC	Unconfined Compression Test
R	R-Value	PERM	Permeability	#200	No. 200 Wash Sieve Analysis

NOTES

1. Soil descriptions are in accordance with the USCS as set forth by ASTM D2488-90 "Standard Practice for Description and Identification Soil (Visual-Manual Procedure)."
2. Soil color described according to Munsell Soil Color Chart. Rock color described according to Munsell Rock-Color Chart
3. Soil descriptions in these borings are generalized representations and based upon visual classification of cuttings and/or samples during drilling. Descriptions and related information in these borings depict subsurface conditions at the specific location and at the time of drilling only. Soil conditions at other locations may differ from conditions observed at the boring locations. Also, soil and groundwater conditions may change with time at these locations.

D. Scott Magorien, C.E.G. 1290
Engineering Geologist

EXPLANATION OF BORING LOGS

MOON CAMP EIR
Fawnskin, California

Project No. 8178.000.0

Figure A-1

P:\8178.000.0\GINT\LOGS.GPJ 08/21/02

PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B1

BORING LOCATION: ~115' N. Highway 38, ~290' E. Canyon Rd.

DATE STARTED: 6/10/02 | DATE FINISHED: 6/11/02

DRILLING METHOD: Mud rotary

HAMMER WEIGHT: 140 lbs | DROP: 30 in.

SAMPLER: SPT

NOTES:
Drilling Contractor: Gregg Drilling & Testing, Inc.
Drilling Equipment: Mobil B-53
Logged By: A. Blanc

ELEV. (feet)	DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
					Surface Elevation:			
	1				SILTY SAND (SM): dark brown (10YR 3/3), dry, ~70% fine to coarse sand~20% fines, nonplastic, ~10% gravel, scattered cobbles, trace roots [SLOPEWASH]			
	2				SANDY CLAY with GRAVEL (CL): strong brown (7.5YR 4/6) to brown (7.5YR 4/4), ~60% fines, ~25% fine to coarse sand, ~15% fine to coarse gravel, medium plasticity, scattered cobbles			
	3							
	4							
	5				CLAYEY SAND (SC): yellowish brown (10YR 5/4), ~65% fine to medium sand, ~35% fines, low plasticity, trace coarse sand [OLDER ALLUVIUM]			
	6	1		27				
	7							
	8							
	9							
	10				~80% fine to coarse sand, ~20% fines			
	11	2		46				
	12							
	13							
	14				pale brown (10YR 6/3), ~25% fines, ~10% fine to coarse gravel, subangular to subrounded			
	15							

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PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B1 (cont'd)

ELEV. (feet)	DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
	16	3	NR	50/5"	CLAYEY SAND (SC): continued			
	17							
	18				SANDY CLAY (CL): yellowish brown (10YR 5/4), ~70% fines, ~30% fine sand, low plasticity, trace medium sand, trace calcium carbonate on fracture surfaces			
	19							
	20	4		50/5"				
	21							
	22							
	23				CLAYEY SAND (SC): pale brown (10YR 6/3) to yellowish brown (10YR 5/4), ~70-80% fine sand, ~10% coarse sand, and gravel size fragments (up to 1/2"), ~20% fines, low plasticity, locally poorly graded with ~10% nonplastic fines			
	24							
	25	5		54/6"				
	26							
	27							
	28				CLAYEY GRAVEL with SAND (GC): pale brown (10YR 6/3), ~65% gravel fragments up to 1", ~20% fine sand, ~15% fines, low plasticity			
	29							
	30	6		70/4"				
	31							
	32							

MAGORIEN_GEO3

PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B1 (cont'd)

ELEV. (feet)	DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
	33				CLAYEY SAND (SC): yellowish brown (10YR 5/4), ~70% fine to coarse sand, ~20% fines, ~10% fine gravel, low plasticity, locally gravelly			
	34							
	35	7		50/5"				
	36							
	37							
	38							
	39							
	40	8		50/2"				
	41							
	42							
	43							
	44							
	45							
	46							
	47							
	48							
	49							

MAGORIEN_GEO3

PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B1 (cont'd)

ELEV. (feet)	DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
	50	9		70/3"	CLAYEY SAND (SC): continued			
	51				Bottom of boring at 50.75 ft bgs. Drilling mud bailed out. Water level measured ~14 ft bgs on 6/11/02 at 15:00. Boring backfilled with cement - bentonite grout.			
	52							
	53							
	54							
	55							
	56							
	57							
	58							
	59							
	60							
	61							
	62							
	63							
	64							
	65							
	66							

MAGORIEN_GEO3

A-5

PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B2

BORING LOCATION: South of Hwy 38 (near lake)

DATE STARTED: 6/11/02 | DATE FINISHED: 6/11/02

DRILLING METHOD: Mud rotary

HAMMER WEIGHT: 140 lbs | DROP: 30 in.

SAMPLER: SPT

NOTES:
Drilling Contractor: Gregg Drilling & Testing, Inc.
Drilling Equipment: Mobil B-53
Logged By: A. Blanc

ELEV. (feet)	DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
					Surface Elevation:			
	1				SILTY SAND (SM): dark brown (10YR 3/3), dry, ~50% fine to coarse sand, ~30% gravel, fine to coarse, angular to subrounded, ~20% fines, nonplastic, scattered cobbles up to 6", roots [SLOPEWASH]			
	2							
	3							
	4				CLAYEY SAND (SC): mottled strong brown and brown (7.5YR 5/4-5/6), ~75% fine to medium sand, ~25% fines, low plasticity, iron oxide staining [OLDER ALLUVIUM]			
	5							
	6		NR	45	trace decayed roots light brown (7.5YR 6/4) with white mottling, ~65-70% fine to medium sand, trace coarse sand, ~30-35% fines			
	7							
	8							
	9				POORLY GRADED SAND with SILT and GRAVEL (SP-SM): yellowish brown (10YR 5/4), ~80% fine to coarse sand, ~15% fine, subrounded gravel, ~5% fines, nonplastic, locally higher fines content			
	10							
	11	2		95				
	12							
	13							
	14				POORLY GRADED SAND with SILT (SP-SM): yellowish brown (10YR 5/4), ~90-95% fine to coarse sand, ~5-10% fines, nonplastic, trace gravel			
	15							

MAGORIEN_GEO3

PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B2 (cont'd)

ELEV. (feet)	DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
	16	3		50/5"	POORLY GRADED SAND with SILT (SP-SM): continued			
	17							
	18							
	19							
	20							
	21	4		72				
	22							
	23							
	24				POORLY GRADED SAND with CLAY (SP-SC): brown (7.5YR 5/4), ~90% fine to coarse sand, ~10% fines, low plasticity			
	25	5		50/5"				
	26							
	27							
	28							
	29				POORLY GRADED SAND with SILT and GRAVEL (SP-SM): brown (7.5YR 5/4), ~60-65% fine to coarse sand, ~30% fine, subrounded gravel, ~5-10% fines, nonplastic to low plasticity			
	30	6		60/6"				
	31							
	32							

MAGORIEN_GEO3

PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B2 (cont'd)

ELEV. (feet)	DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	MATERIAL DESCRIPTION	LABORATORY TESTS Moisture Content (%)	LABORATORY TESTS Dry Density (pcf)	LABORATORY TESTS Other Tests
	33				POORLY GRADED SAND with SILT and GRAVEL (SP-SM): continued			
	34							
	35	7		50/4"				
	36							
	37							
	38				POORLY GRADED SAND with GRAVEL (SP): yellowish brown (10YR 5/4), ~80% fine to coarse sand, ~15% fine gravel, ~5% fines, nonplastic			
	39							
	40	8		60/6"				
	41							
	42							
	43				CLAYEY SAND (SC): yellowish brown (10YR 5/4), ~85% fine to coarse sand, ~15% fines, low plasticity, trace fine gravel, trace mica			
	44							
	45	9		50/6"				
	46							
	47							
	48							
	49							

MAGORIEN_GEO3

PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B2 (cont'd)

ELEV. (feet)	DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
	50	10		55/6"	CLAYEY SAND (SC): continued			
	51				Bottom of boring at 50.5 ft bgs. Groundwater estimated at ~14 ft bgs following bailing of mud out of the borehole. Boring backfilled with cement grout with 5% bentonite.			
	52							
	53							
	54							
	55							
	56							
	57							
	58							
	59							
	60							
	61							
	62							
	63							
	64							
	65							
	66							

MAGORIEN_GEO3

PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B3

BORING LOCATION: Off Moon Lane (east)

DATE STARTED: 6/10/02 | DATE FINISHED: 6/11/02

DRILLING METHOD: Mud rotary

HAMMER WEIGHT: 140 lbs | DROP: 30 in.

SAMPLER: SPT

NOTES:
Drilling Contractor: Gregg Drilling & Testing, Inc.
Drilling Equipment: Mobil B-53
Logged By: A. Blanc

ELEV. (feet)	DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
					Surface Elevation:			
	1	1			SILTY SAND with GRAVEL (SM): brown (10YR 5/3), ~60% fine to coarse sand, ~20% fine to coarse gravel up to 1.5", angular to subrounded, ~20% fines, nonplastic [RECENT ALLUVIUM]			
	2							
	3							
	4							
	5							
	6			37				
	7							
	8				CLAYEY GRAVEL with SAND (GC): yellowish brown (10YR 5/4), ~50% fine to coarse subrounded gravel, ~35% fine to coarse sand, ~15% fines, low plasticity			
	9							
	10	2						
	11			42	CLAYEY SAND with GRAVEL (SC): light olive brown (2.5Y 5/4) with white and dark olive gray mottling, ~60% fine to coarse sand, ~20% fine gravel, ~20% fines, low plasticity			
	12							
	13							
	14							
	15							

MAGORIEN_GEO3

PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B3 (cont'd)

ELEV. (feet)	DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
	16	3	NR	50/4"	SILTY SAND (SM): pale olive (5Y 6/4), ~75% fine sand, ~25% fines, nonplastic [OLDER ALLUVIUM]			
	17							
	18				CLAYEY SAND (SC): olive brown (7.5Y 4/4), ~70% fine to medium sand, ~30% fines, low plasticity			
	19							
	20							
	21	4	NR	44	SANDY CLAY (CL): olive (5Y 5/3), ~60% fines, ~40% fine sand, low plasticity, locally hard/cemented			
	22							
	23							
	24				~55% fines, ~45% fine sand			
	25							
	26	5		57/6"	CLAYEY SAND (SC): olive (5Y 5/3), ~75% fine sand, ~25% fines, low plasticity			
	27							
	28							
	29				fine to medium sand, trace coarse sand, locally cemented			
	30	6		50/4"				
	31				cemented, gravelly			
	32							

MAGORIEN_GEO3

PROJECT: MOON CAMP EIR
Fawnskin, California

Log of Boring No. B3 (cont'd)

ELEV. (feet)	DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (pcf)	LABORATORY TESTS: Other Tests
	33				CLAYEY SAND (SC): continued			
	34							
	35	7		50/4"				
	36							
	37							
	38							
	39							
	40							
	41							
	42							
	43							
	44							
	45	8		50/2"	Bottom of boring at 45 ft bgs. Drilling mud bailed out of hole. Water measured at ~26 ft bgs on 6/11/02 at 0730. Boring backfilled with cement-bentonite grout.			
	46							
	47							
	48							
	49							

MAGORIEN_GEO3

15.9 Hydrology Data

MOON CAMP TENTATIVE TRACT 16136 HYDROLOGY AND WATER QUALITY TECHNICAL APPENDIX

Prepared For:

San Bernardino County

Prepared By:

RBF CONSULTING

PLANNING ■ DESIGN ■ CONSTRUCTION

Contact Person:
Rebecca Kinney, RCE 58797
Seema C. Shah

Revised

August 2002
June 20002

JN 10101901

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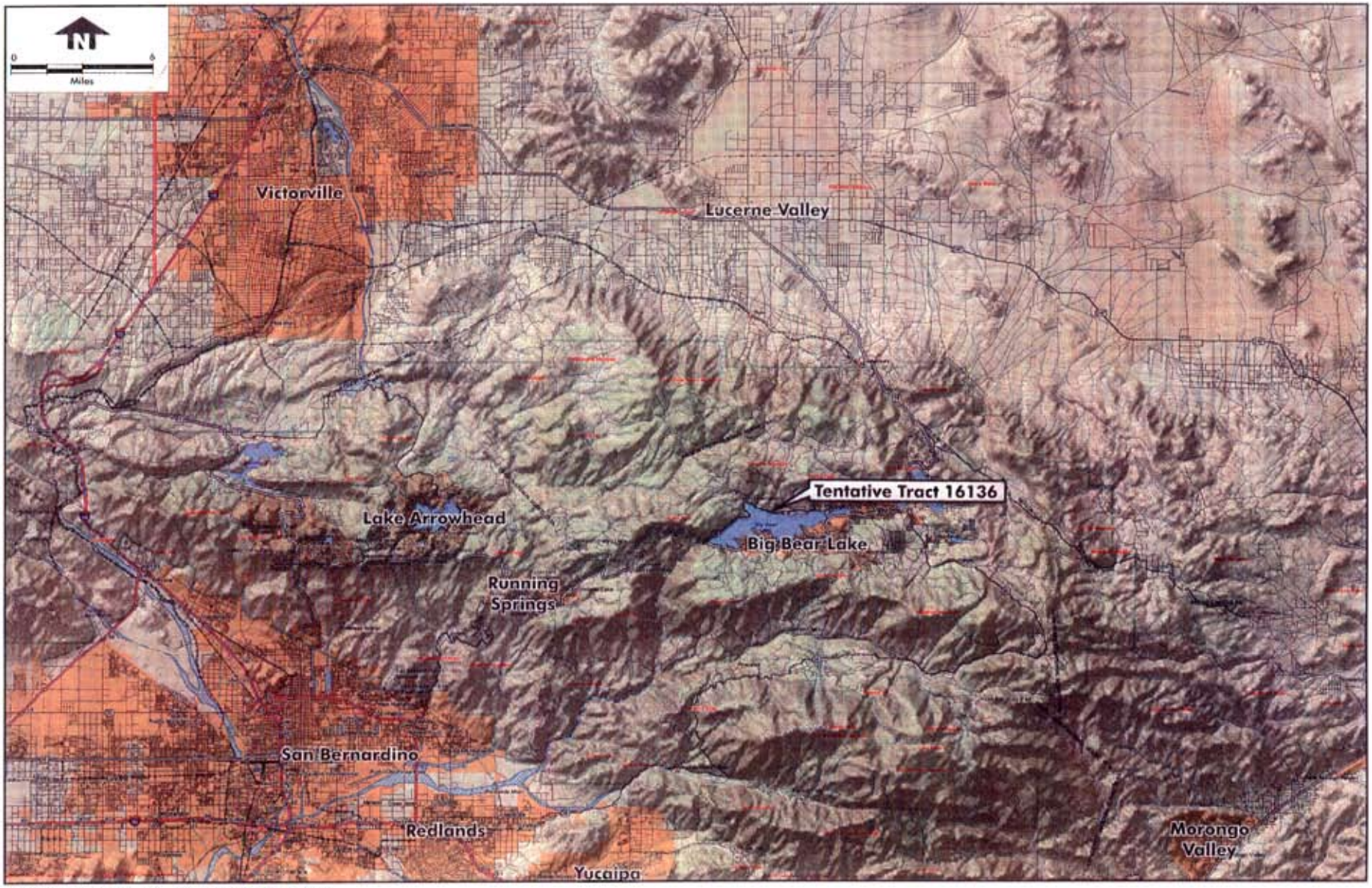
Appendix A: AES Rational Method - Existing Condition
Appendix B: AES Rational Method - Proposed Condition

1.0 INTRODUCTION

The following study is the Hydrology and Drainage Technical Appendix prepared as part of the *Moon Camp Tentative Tract 16136 Environmental Impact Report (EIR)*. The Moon Camp project encompasses approximately 62.4 acres along the north shore of Big Bear Lake, in the community of Fawnskin, San Bernardino County (refer to Figure 1, Regional Vicinity Map). The Big Bear Lake area serves as a destination resort community and many of the residences are second homes. As many as 50,000 people visit the area on peak holiday weekends.

The Local Vicinity Map (Figure 2) shows the project site being adjacent to the north shore of Big Bear Lake in the relatively undeveloped eastern portion of Fawnskin. The site is located more specifically in the north half of Section 13, Township 2 North, Range 1 west, San Bernardino Base and Meridian. The property is bounded by Oriole Lane and Canyon Road to the west, Polique Canyon Road to the east and Flicker Road to the north. Regional access is provided from State Highway 38, which bisects the property.



Source: Lilburn Corporation, August 20, 2001.

FIGURE 1

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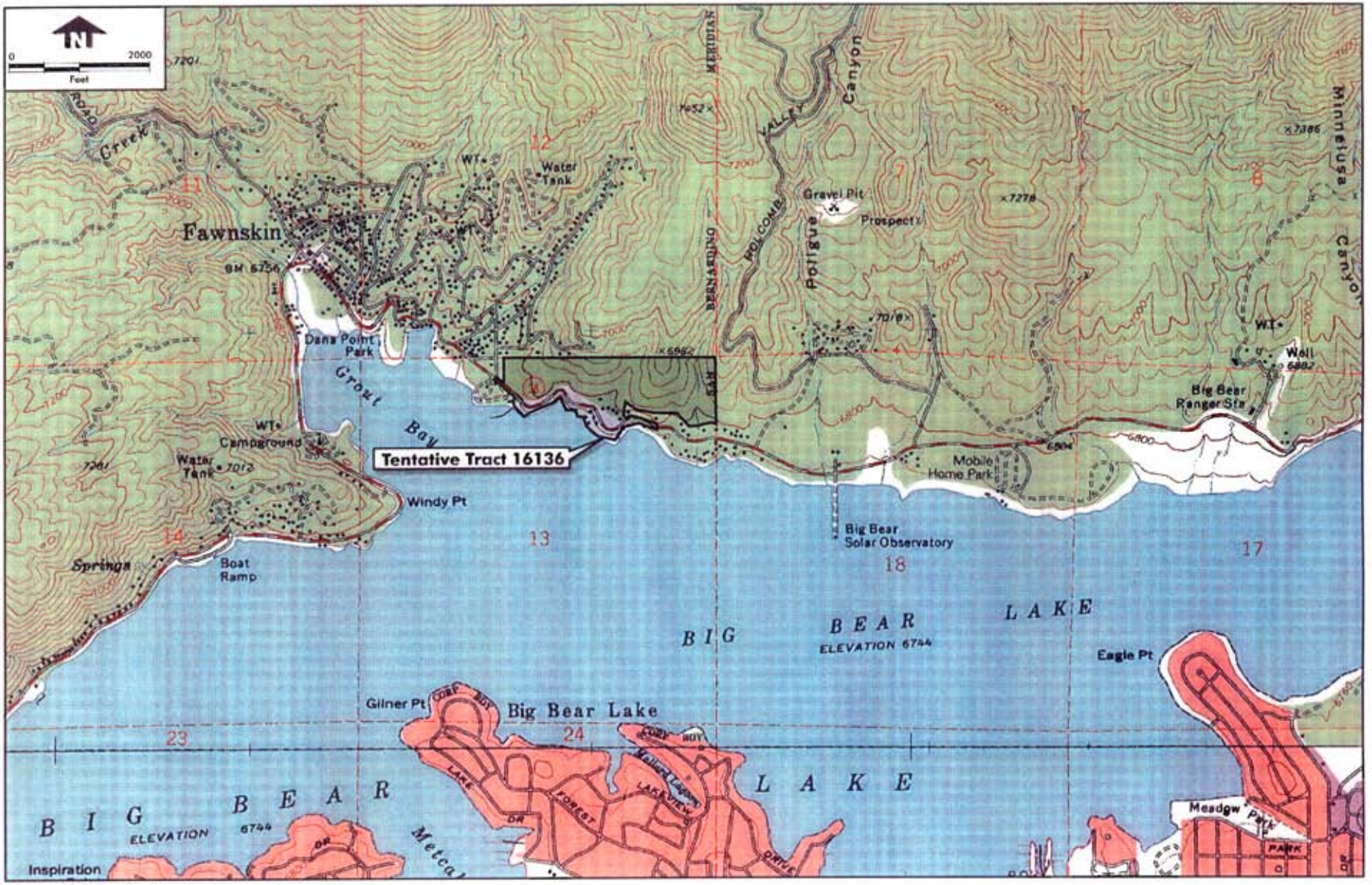
05/02

JN 10-101901

Regional Vicinity Map



Source: Lilburn Corporation, August 20, 2001.

FIGURE 2

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05/02

JN 10-101901

Local Vicinity Map

1.2 Definition of Level of Significance

The purpose of this technical evaluation is to determine the impact of the proposed development of Moon Camp on surface water drainage and storm water quality within San Bernardino County and Big Bear Lake. Should the analysis determine that the proposed project significantly impacts surface water drainage or storm water quality, appropriate mitigation will be identified to minimize the project impact to a less than significant level.

Federal, state and local drainage laws and regulations govern the evaluation of impacts to surface water drainage. For this evaluation, impacts to surface water drainage would be considered significant if the project alters the drainage patterns of the site, which would result in substantial erosion, siltation, or increase runoff that would result in increased flooding. Increase in the amount of runoff could be considered significant if it impacts State Highway 38 or downstream storm drain facilities.

The evaluation of impacts to storm water quality is of growing concern throughout Southern California. In response to the growing concerns and implementation of the Clean Water Act, the Santa Ana Regional Water Quality Control Board has a National Pollution Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for San Bernardino County. The Order Number is R8-2002-0012. The current NPDES number for San Bernardino County is CAS618036.

Development Planning for Storm Water Management:

The requirement to implement a program for development planning was based on federal and state statutes including: Section 402 (p) of the Clean Water Act. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

1. Effectively prohibit non-storm water discharges, and
2. Reduce the discharge of pollutants from storm water conveyance system to the Maximum Extent Practicable.

For this evaluation, impacts to storm water quality would be considered significant if the project did not attempt to address storm water pollution to the maximum extent practicable. Currently, there are no definitive water quality standards that require storm water quality leaving a project site to meet standards for individual pollutants. Therefore, impacts to storm water quality will be considered less than significant if they meet the requirements of the Water Quality Management Plan (WQMP). Starting January 2004 permittees (San Bernardino County) are required to revie their existing BMPs for new developments and submit to Executive Officers for Review. Based on Order No. R8-200-0012 for San Bernardino County all new developments must follow the following guidelines:

> A new development is defined as projects for which tentative tract or parcel map approval was not received by June 1, 2004. However, projects that have not commenced grading by the initial expiration date of the tentative tract or parcel map approval shall be deemed a new development project as defined in this section. New development does not include projects receiving map approval after June 1, 2004 that are proceeding under a common scheme of development that was the subject of a tentative tract or parcel map approval that occurred prior to June 1, 2004.

The WQMP requirements for on-site and or watershed based BMPs include the following:

1. The pollutants in post-development runoff shall be reduced using controls that utilize best available technology (BAT) and best conventional technology (BCT).
2. The discharge of any listed pollutant to an impaired waterbody on the 303(d) list shall not cause or contribute to an exceedance of receiving water quality objective.

2.0 EXISTING CONDITIONS

The purpose of this existing conditions evaluation is to establish a baseline for comparison of the pre-project and the post-project conditions. Baseline conditions investigated include: land use, hydrology, floodplain mapping, and surface water quality.

2.1 Existing Land Use

The 62.4-acre Moon Camp site is located on the north shore of Big Bear Lake. San Bernardino County currently designates the site as Rural Living. The site has a variety of natural ground cover and is forested with Oaks, Pines and Juniper trees. There is some development on the lake front portion of the site. The rest of the area around the project site is undeveloped forest.

The watershed tributary to the site can be broken up into nine drainage areas composed of approximately 177 acres. Flows enter Big Bear Lake via cross culverts under Highway 38 and direct sheet flow over Highway 38. The drainage areas are labeled A through I. Area A, located on the eastern end of the project contains a natural channel passing through the center of this sub-watershed. It is the largest drainage area composed of 98 acres.

2.2 Hydrology

Hicks & Hartwick, Inc conducted the hydrology analysis that provides the basis for the existing condition hydrology for Moon Camp development. Hydrologic calculations to evaluate surface runoff associated with 10-year and 100-year hypothetical design storm frequencies from the tributary drainage areas were performed using 1983-1994 Advances Engineering Software 1983-1994 (AES). The computer software (AES) creates an inactive watershed system to compute hydraulic and hydrological information for a given watershed. The watershed subarea boundaries were delineated in their *Preliminary Drainage Study*. Hydrologic parameters used in the analysis, such as rainfall and soil classification, are presented in the *San Bernardino County Hydrology Manual* dated May 1983. Figure 3 contains the hydrology map for the existing condition.

2.2.1 Existing Watershed Description

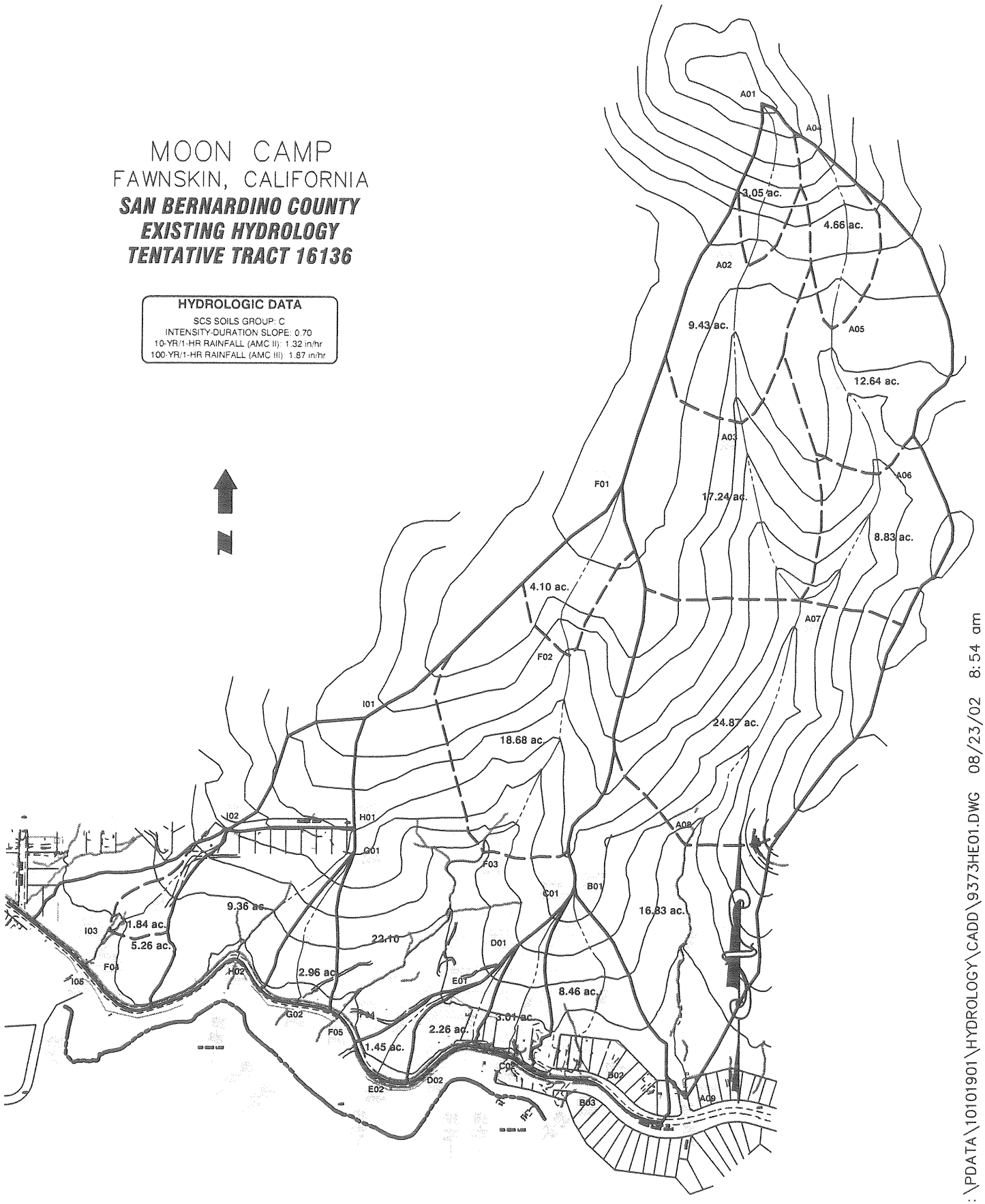
The historic drainage pattern for the areas follow the natural topography, south to north with the flow outleting to Big Bear Lake.

The maximum elevation differential of the watershed is approximately 213 feet (from elevation 2,960 at the northeast boundary to 2,747 feet at the lakefront). The site has slopes of five to 40 percent. Due to onsite drainage patterns, the project site was split into nine areas (A through I). Area "A" is on the eastern portion and area "I" is on the western end of the watershed.

MOON CAMP
FAWNSKIN, CALIFORNIA
SAN BERNARDINO COUNTY
EXISTING HYDROLOGY
TENTATIVE TRACT 16136

HYDROLOGIC DATA

SCS SOILS GROUP: C
INTENSITY-DURATION SLOPE: 0.70
10-YR/1-HR RAINFALL (AMC II): 1.32 in/hr
100-YR/1-HR RAINFALL (AMC III): 1.87 in/hr



H:\PDATA\10101901\HYDROLOGY\CADD\9373HE01.DWG 08/23/02 8:54 am

SOURCE: HICKS & HARTWICK, INC. PRELIMINARY DRAINAGE STUDY

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JOB No.	MOON CAMP EXISTING CONDITION HYDROLOGY MAP	FIGURE
10-101901		3
SCALE 1" = 600'		

Table No. 1 – Drainage Area Breakdown		
Drainage Area	Area (acres)	Number of Subareas
A	95.4	8
B	8.5	1
C	3.0	1
D	2.3	1
E	1.5	1
F	44.9	3
G	3.0	1
H	9.4	1
I	11.4	3

The nine drainage areas and subareas for the existing condition are illustrated in Figure 3.

Table No. 2 – Existing Subwatershed Characteristics			
Nodes	**Area (acres)**	**Length (feet)**	**Soil Type / Development Type**
Watershed A			
A1 – A2	3	779	D / Natural
A2 – A3	9.4	730	D / Natural
A3 – A7	17.2	869	D / Natural
A4 – A5	4.7	890	D / Natural
A5 – A6	12.6	719	D / Natural
A6 – A7	8.8	719	C / Natural
A7 – A8	24.9	1261	C / Natural
A8 – A9	16.8	1233	C / Natural
Watershed B			
B1 – B2	8.5	997	C / 1D AC
Watershed C			
C1 – C2	3.0	794	C / 2.5 AC
Watershed D			
D1 – D2	2.3	774	C / 2.5 AC
Watershed E			
E1 – E2	1.5	683	C / Natural
Watershed F			
F1 – F2	4.1	848	C / Natural
F2 – F3	18.7	1044	C / Natural
F3 – F4	22.1	1109	C / Natural
Watershed G			
G1 – G2	3.0	781	C / Natural
Watershed H			
H1 – H2	9.4	833	C / 2.5 AC
Watershed I			
I1 – I2	4.3	1050	C / 4D AC
I2 – I3	1.8	705	C / 2.5 AC
I3 – I4	5.3	292	C / Natural

Area "A" is composed of 8 subareas. Currently all land in area "A" is natural. There is a natural channel running down the center of watershed "A". Approximately 50 percent of the land on the north end of sub-watershed "A" is composed of soil type "D", while the remainder is composed of soil type "C".

Area "B" is composed of 1 subarea. Area "B's" land use includes 1 dwelling unit per acre.

Areas "C", "D", and "H" are all composed of 1 subarea. Within these subarea, the land use includes 1 dwelling unit for every 2.5 acres.

Areas "E" and "G" are also composed of 1 subarea each. Within these subareas, the land use is natural.

Area "F" is composed of 3 subareas. The land use for the entire drainage area is natural.

Area "I" is composed of 3 subareas. In the upper drainage area the land use is 4 dwelling units per acre. In the second drainage area, land use includes 1 dwelling unit per 2.5 acres. The downstream drainage area in subarea "I" is considered natural.

During a site visit, it was noticed the existing culverts, crossing the state highway were either plugged with sediment, had crushed inlets, or both. These deficiencies result in little to no capacity in the existing culverts. The deficiencies cause ponding and overtopping of the highway. Figure 4 contains current condition of the culvert crossings across Highway 38.

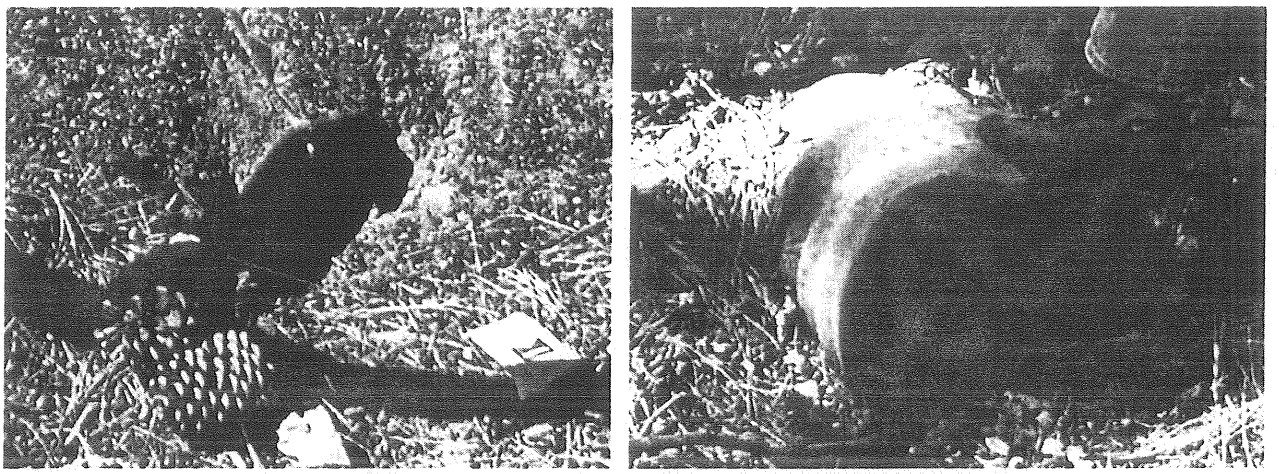

Figure 4 – Sediment and Crushed Pipes Along Highway 38.

2.2.2 Rational Method

Hicks & Hartwick performed the hydrologic calculations to determine the 10-year and 100-year peak flow rates using the *San Bernardino County Hydrology Manual* dated May 1983. The Rational Method is an empirical computation procedure used to develop a peak runoff rate (discharge) for storms of a specific recurrence interval. Rational Method equations are based on the assumption that the peak flowrate is directly proportional to the drainage area, rainfall intensity, and a loss coefficient, which describes the effects of land use and soil type. The design discharges were computed by generating a hydrologic "link-node" model, which divides the area into drainage

subareas. These subareas are tributary to a concentration point or hydrologic "node" point determined by the existing terrain and street layout. The following assumptions/guidelines were applied for use of the Rational Methods:

1. The Rational Method hydrology includes the effects of infiltration caused by soil surface characteristics. The soils map from the *San Bernardino County Manual* indicates that the study area consists of soil types "C and D."

2. The infiltration rate is also affected by the type of vegetation or ground cover and percentage of impervious surfaces. The amount of imperviousness used for the existing condition ranged from 0% for natural open areas and 10% to 20% for single family housing.

3. The time of concentration (T_c) is determined utilizing the *San Bernardino County Hydrology Manual.*

4. The gutter flow option was used to model the natural channel since the side slopes and Manning's "n" values can be changed.

5. Standard Intensity-Duration Curve data was obtained from the *San Bernardino County Hydrology Manual.*

2.2.3 Existing Condition Surface Water Hydrology

To establish the baseline hydrologic conditions for Moon Camp, both 10-year and 100-year frequency storm were analyzed by Hicks & Hartwick. The flows for the 10-year storm are used to determine local storm drain sizing, while the 100-year analysis is used for larger master plan facilities and floodplain mapping. The predominant hydrologic soil classification of the natural watershed is soil type "C" and "D", which corresponds to a high runoff potential, with the soil having slow infiltration rates consistent with clay soils.

Appendix A contains the Hicks & Hartwick existing condition analysis utilizing the 1983-1994 Advanced Engineering Software. Table 3 summarizes the results.

Table No. 3 – Existing Conditions Peak Flowrates

Subarea	Area (acres)	Total Area (AC)	Tc (min)	Total 10-Yr. Peak Q (cfs)	Total 100-Yr. Peak Q (cfs)
Watershed A					
A1 – A2	3	3	16.6	7.8	12.2
A2 – A3	9.4	12.5	17.4	30.3	48.4
A3 – A7	17.2	29.7	18.3	69.0	111.0
A4 – A5	4.7	4.7	18.4	11.0	17.4
A5 – A6	12.6	17.3	19.2	39.4	62.5
A6 – A7	8.8	26.1	20.0	57.4	91.6
A7 – A8	24.9	79.0	19.6	170.1	227.3
A8 – A9	16.8	95.9	21.2	191.5	317.3

Table No. 3 – Existing Conditions Peak Flowrates					
Subarea	Area (acres)	Total Area (AC)	Tc (min)	Total 10-Yr. Peak Q (cfs)	Total 100-Yr. Peak Q (cfs)
Watershed B					
B1 – B2	8.5	8.5	10.3	31.1	47.3
Watershed C					
C1 – C2	3.0	3.0	9.4	11.7	17.9
Watershed D					
D1 – D2	2.3	2.3	10.0	8.3	12.8
Watershed E					
E1 – E2	1.5	1.5	19.9	3.1	5
Watershed F					
F1 – F2	4.1	4.1	20.0	8.6	14.1
F2 – F3	18.7	22.8	21.1	45.6	75.2
F3 – F4	22.1	44.9	22.5	84.4	141.1
Watershed G					
G1 – G2	3.0	3.0	18.1	6.7	10.9
Watershed H					
H1 – H2	9.4	9.4	9.6	35.7	54.6
Watershed I					
I1 – I2	4.3	4.3	9.4	17.3	25.7
I2 – I3	1.8	6.1	10.2	22.9	34.7
I3 – I4	5.3	11.4	10.7	40.2	61.9

2.3 Floodplain Mapping

The County of San Bernardino is a participant in the National Flood Insurance Program (NFIP). Communities participating in the NFIP must adopt and enforce minimum floodplain management standards, including identification of flood hazards and flooding risks. Participation in the NFIP allows communities to purchase low cost insurance protection against losses from flooding. The published Flood Insurance Rate Maps (FIRMs) for the project site are included on Community Panel Number 060270 7295B. The FIRMs indicated that there are no existing flood hazards within the project site.

2.4 Jurisdictional Waters

Based on a field survey conducted on March 15, 2002 by RBF Consulting, it was determined that 0.15 acres of jurisdictional waters exist on site.

2.5 Storm Water Quality

As indicated in Section 1.2, storm water quality is a significant concern in Southern California. This

section discusses typical pollutants found in storm water runoff and discusses what sort of contaminants maybe found in existing storm water runoff. Based on the Clean Water Act a 303 (d) list has been developed, which includes Big Bear Lake. For a specific discussion concerning the status of the 303(d) listing for Big Bear Lake refer to Section 2.5.3.

2.5.1 Nonpoint Source Pollutants

A net effect of urbanization can be to increase pollutant export over naturally occurring conditions. The impact of the higher export can be on the adjacent streams and also on the downstream receiving waters. However, an important consideration in evaluating storm water quality from the project is to assess if it impairs the beneficial use to the receiving waters. Nonpoint source pollutants have been characterized by the following major categories in order to assist in determining the pertinent data and its use. Receiving waters can assimilate a limited quantity of various constituent elements, but there are thresholds beyond which the measured amount becomes a pollutant and results in an undesirable impact. Background of these standard water quality categories provides understanding of typical urbanization impacts.

Sediment - Sediment is made up of tiny soil particles that are washed or blown into surface waters. It is the major pollutant by volume in surface water. Suspended soil particles can cause the water to look cloudy or turbid. The fine sediment particles also act as a vehicle to transport other pollutants including nutrients, trace metals, and hydrocarbons. Construction sites are the largest source of sediment for urban areas under development. Another major source of sediment is streambank erosion, which may be accelerated by increases in peak rates and volumes of runoff due to urbanization.

Nutrients - Nutrients are a major concern for surface water quality, especially phosphorous and nitrogen, can cause algal blooms and excessive vegetative growth. Of the two, phosphorus is usually the limiting nutrient that controls the growth of algae in lakes. The orthophosphorous form of phosphorus is readily available for plant growth. The ammonium form of nitrogen can also have severe effects on surface water quality. The ammonium is converted to nitrate and nitrite forms of nitrogen in a process called nitrification. This process consumes large amounts of oxygen which can impair the dissolved oxygen levels in water. The nitrate form of nitrogen is very soluble and is found naturally at low levels in water. When nitrogen fertilizer is applied to lawns or other areas in excess of plant needs, nitrates can leach below the root zone, eventually reaching ground water. Orthophosphate from auto emissions also contributes phosphorus in areas with heavy automobile traffic. As a general rule of thumb, nutrient export is greatest from development sites with the most impervious areas. Other problems resulting from excess nutrients are 1) surface algal scums, 2) water discolorations, 3) odors, 4) toxic releases, and 5) overgrowth of plants. Common measures for nutrients are total nitrogen, organic nitrogen, total Kjeldahl nitrogen (TKN), nitrate, ammonia, total phosphate, and total organic carbon (TOC).

Trace Metals - Trace metals are primarily a concern because of their toxic effects on aquatic life, and their potential to contaminate drinking water supplies. The most common trace metals found in urban runoff are lead, zinc, and copper. Fallout from automobile emissions is also a major source of lead in urban areas. A large fraction of the trace metals in urban runoff are attached to sediment and this effectively reduces the level, which is immediately available for biological uptake and subsequent bioaccumulation. Metals associated with the sediment settle out rapidly and accumulate in the soils. Also, urban runoff events typically occur over a shorter duration, which reduces the amount of exposure, which could be toxic to the aquatic environment. The toxicity of trace metals in

runoff varies with the hardness of the receiving water. As total hardness of the water increases, the threshold concentration levels for adverse effects increases.

Oxygen-Demanding Substances - Aquatic life is dependent on the dissolved oxygen in the water and when organic matter is consumed by microorganisms then dissolved oxygen is consumed in the process. A rainfall event can deposit large quantities of oxygen demanding substance in lakes and streams. The biochemical oxygen demand of typical urban runoff is on the same order of magnitude as the effluent from an effective secondary wastewater treatment plant. A problem from low DO results when the rate of oxygen-demanding material exceeds the rate of replenishment. Oxygen demand is estimated by direct measure of DO and indirect measures such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), oils and greases, and total organic carbon (TOC).

Bacteria - Bacteria levels in undiluted urban runoff exceed public health standards for water contact recreation almost without exception. Studies have found that total coliform counts exceeded EPA water quality criteria at almost every site and almost every time it rained. The coliform bacteria that are detected may not be a health risk in themselves, but are often associated with human pathogens.

Oil and Grease - Oil and grease contain a wide variety of hydrocarbons some of which could be toxic to aquatic life in low concentrations. These materials initially float on water and create the familiar rainbow-colored film. Hydrocarbons have a strong affinity for sediment and quickly become absorbed to it. The major source of hydrocarbons in urban runoff is through leakage of crankcase oil and other lubricating agents from automobiles. Hydrocarbon levels are highest in the runoff from parking lots, roads, and service stations. Residential land uses generate less hydrocarbons export, although illegal disposal of waste oil into storm waters can be a local problem.

Other Toxic Chemicals - Priority pollutants are generally related to hazardous wastes or toxic chemicals and can be sometimes detected in storm water. Priority pollutant scans have been conducted in previous studies of urban runoff, which evaluated the presence of over 120 toxic chemicals and compounds. The scans rarely revealed toxins that exceeded the current safety criteria. The urban runoff scans were primarily conducted in suburban areas not expected to have many sources of toxic pollutants (with the possible exception of illegally disposed or applied household hazardous wastes). Measures of priority pollutants in storm water include - 1) phthalate (plasticizer compound), 2) phenols and creosols (wood preservatives), 3) pesticides and herbicides, 4) oils and greases, 5) metals.

2.5.2 Physical Characteristics of Surface Water Quality

Standard parameters, which can assess the quality of storm water, provide a method of measuring impairment. A background of these typical characteristics assists in understanding water quality requirements. The quantity of a material in the environment and its characteristics determine the degree of availability as a pollutant in surface runoff. In an urban environment, the quantity of certain pollutants in the environment is a function of the intensity of the land use. For instance, a high density of automobile traffic makes a number of potential pollutants (such as lead and hydrocarbons) more available. The availability of a material, such as a fertilizer, is a function of the quantity and the manner in which it is applied. Applying fertilizer in quantities that exceed plant needs leaves the excess nutrients available for loss to surface or ground water.

The physical properties and chemical constituents of water traditionally have served as the primary means for monitoring and evaluating water quality. Evaluating the condition of water through a water quality standard refers to its physical, chemical, or biological characteristics. Water quality parameters for storm water comprise a long list and are classified in many ways. In many cases, the concentration of an urban pollutant, rather that the annual load of that pollutant, is needed to assess a water quality problem. Some of the physical, chemical or biological characteristics that evaluate the quality of the surface runoff are:

Dissolved Oxygen - Dissolved oxygen in the water has a pronounced effect on the aquatic organisms and the chemical reactions that occur. It is one of the most important biological water quality characteristics in the aquatic environment. The dissolved oxygen concentration of a water body is determined by the solubility of oxygen, which is inversely related to water temperature, pressure, and biological activity. Dissolved oxygen is a transient property that can fluctuate rapidly in time and space. Dissolved oxygen represents the status of the water system at a particular point and time of sampling. The decomposition of organic debris in water is a slow process and the resulting changes in oxygen status respond slow also. The oxygen demand is an indication of the pollutant load and includes measurements of biochemical oxygen demand or chemical oxygen demand.

Biochemical Oxygen Demand (BOD) - The biochemical oxygen demand (BOD) is an index of the oxygen-demanding properties of the biodegradable material in the water. Samples are taken from the field and incubated in the laboratory at 20°C, after which the residual dissolved oxygen is measured. The BOD value commonly referenced is the standard 5-day values. These values are useful in assessing stream pollution loads and for comparison purposes.

Chemical Oxygen Demand - The chemical oxygen demand (COD) is a measure of the pollutant loading in terms of complete chemical oxidation using strong oxidizing agents. It can be determined quickly because it does not rely on bacteriological actions as with BOD. COD does not necessarily provide a good index of oxygen demanding properties in natural waters.

Total Dissolved Solids (TDS) - TDS concentration is determined by evaporation of a filtered sample to obtain residue whose weight is divided by the sample volume. The TDS of natural waters varies widely. There are several reasons why TDS is an important indicator of water quality. Dissolved solids affect the ionic bonding strength related to other pollutants such as metals in the water. TDS are also a major determinant of aquatic habitat. TDS affects saturation concentration of dissolved oxygen and influences the ability of a water body to assimilate wastes. Eutrophication rates depend on total dissolved solids.
pH - The pH of water is the negative log, base 10, of the hydrogen ion (H^+) activity. A pH of 7 is neutral; a pH greater than 7 indicates alkaline water; a pH less than 7 represents acidic water. In natural water, carbon dioxide reactions are some of the most important in establishing pH. The pH at any one time is an indication of the balance of chemical equilibrium in water and affects the availability of certain chemicals or nutrients in water for uptake by plants. The pH of water directly affects fish and other aquatic life and generally toxic limits are pH values less than 4.8 and greater than 9.2.

Alkalinity - Alkalinity is the opposite of acidity, representing the capacity of water to neutralize acid. Alkalinity is also linked to pH and is caused by the presence of carbonate, bicarbonate, and hydroxide, which are formed when carbon dioxide is dissolved. A high alkalinity is associated with a

high pH and excessive solids. Most streams have alkalinities less than 200 mg/l and ranges of alkalinity of 100-200mg/l seem to support well-diversified aquatic life.

Specific Conductance - The specific conductivity of water, or its ability to conduct an electric current, is related to the total dissolved ionic solids. Long term monitoring a project waters can develop a relationship between specific conductivity and TDS. Its measurement is quick and inexpensive and can be used to approximate TDS. Specific conductivities in excess of 2000 µohms/cm indicate a TDS level too high for most freshwater fish.

Turbidity - The clarity of water is an important indicator of water quality that relates to the alkalinity of photosynthetic light to penetrate. Turbidity is an indicator of the property of water that causes light to become scattered or absorbed. Turbidity is caused by suspended clays and other organic particles. It can be used as an indicator of certain water quality constituents such as predicting the sediment concentrations.

Nitrogen (N) - Sources of nitrogen in storm water are from the additions of organic matter to water bodies or chemical additions. Ammonia and nitrate are important nutrients for the growth of algae and other plants. Excessive nitrogen can lead to eutrophication since nitrification consumes dissolved oxygen in the water. Nitrogen occurs in many forms. Organic Nitrogen breaks down into ammonia, which eventually becomes oxidized to nitrate-nitrogen, a form available for plants. High concentrations of nitrate-nitrogen (N/N) in water can stimulate growth of algae and other aquatic plants, but if phosphorus (P) is present, only about 0.30 mg/l of nitrate-nitrogen is needed for algal blooms. Some fish life can be affected when nitrate-nitrogen exceeds 4.2 mg/l. There are a number of ways to measure the various forms of aquatic nitrogen. Typical measurements of nitrogen include Kjeldahl nitrogen (organic nitrogen plus ammonia); ammonia; nitrite plus nitrate; nitrite; and nitrogen in plants. The principal water quality criteria for nitrogen focus on nitrate and ammonia.

Phosphorus (P) - Phosphorus is an important component of organic matter. In many water bodies, phosphorus is the limiting nutrient that prevents additional biological activity from occurring. The origin of this constituent in urban storm water discharge is generally from fertilizers and other industrial products. Orthophosphate is soluble and is considered to be the only biologically available form of phosphorus. Since phosphorus strongly associates with solid particles and is a significant part of organic material, sediments influence concentration in water and are an important component of the phosphorus cycle in streams. Important methods of measurement include detecting orthophosphate and total phosphorus.

2.5.3 Existing Storm Water Quality

Water quality monitoring has been conducted on Big Bear Lake. The monitoring has resulted in Big Bear Lake being listed on the Santa Ana Regional Water Quality Board Section 303(d) list for impaired water bodies. Table 4 contains the 303(d) list of the pollutants found in the lake and the source of the pollutant.

Table No. 4 – Big Bear Lake Pollutant List[1]

Pollutant Stressors	Source	Priority
Copper	Resource Extraction	High
Mercury	Resource Extraction	High

[1] Draft 2002 Clean Water Act Section 303(D) List and TMDL Priority Schedule

Table No. 4 – Big Bear Lake Pollutant List[1]		
Pollutant Stressors	**Source**	**Priority**
Metals	Resource Extraction	High
Noxious Aquatic Plants	Unknown Non-Point Source	High
Nutrients	Construction and Snow Skiing Activities	High
Sedimentation and Siltation	Construction, Snow Skiing Activities and Unknown Non-Point Source	High

The proposed project site lacks data on storm water runoff quality. In the absence of site-specific data, expected storm water quality can be qualitatively discussed by relating typical pollutants to specific land uses.

Currently, the site contains a few homes, but is primarily open space with trees and shrubs. The watershed is primarily open land with 83.7% of the watershed 100% pervious (natural area), 4.7% is 80% pervious (1 dwelling unit per acre), 9.2% is 70% pervious (2.5 dwelling units per acre) and 2.4% is 60% pervious (4 dwelling units per acre). The expected existing pollutants in the existing condition storm water runoff from the residential area is trash, nutrients, bacteria, oil and grease, and household hazardous wastes from the residential development. There is also oil and grease associated with automobile use on site and on Highway 38. The natural areas that make up most of the site will contribute suspended solids.

Currently, the site does not contain any structural Best Management Practices (BMP), which would potentially decrease the amount of pollutants in storm water runoff. It is likely that portions of potential pollutants are removed through the use of natural conveyance. Conveying flows overland through vegetation affords some infiltration and biofiltration of runoff and thus, potential pollutant removal. However, the residential areas are on the lakeshore end of the site, providing little natural conveyance. A draw back to conveying flows overland is that it tends to create erosion problems and thus increase suspended solids in the runoff. Problems associated with suspended solids and erosion is evident on site (See Figure 5).

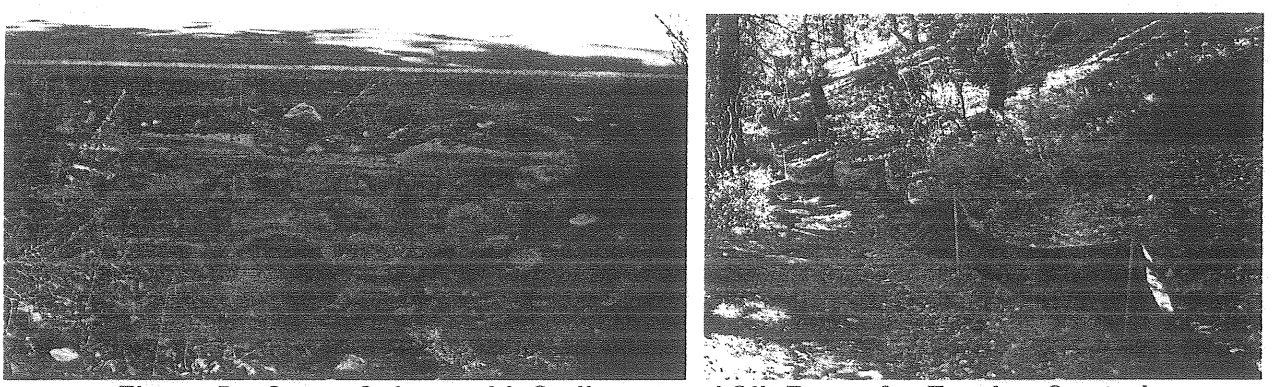

Figure 5 – Cross Culvert with Sediment and Silt Fence for Erosion Control

2.6 Groundwater

3.0 PROPOSED PROJECT

This section discusses the proposed project evaluation, which is then compared to the existing conditions analysis to determine impacts associated with the development of the property. Proposed conditions investigated include: land use, proposed storm drain configuration, hydrology, floodplain mapping, and surface water quality. Hicks and Hartwick, Inc conducted a preliminary drainage study on the proposed development.

3.1 Proposed Land Use Plan

The proposed project involves the development of residential subdivision on 62.4 acres along the north shore of Big Bear Lake. The project proposes a 95-lot residential subdivision. Each lot will be sold and developed on an individual basis. The proposed site will contain a Tentative Tract Map for 92 numbered and three lettered lots. The three lettered lots are identified as follows: (1) Lot "A" is a private street designed to provide access to the southernmost lots; (2) Lot "B" is a 1.4-acre strip of land that will remain between the relocation of State Highway 38 and the private Street, Lot "A"; and (3) Lot "C" is a gated entrance to the project, including a proposed boat dock, consisting of 100 boat slips, which would be available for use by residents of the tract and accessible by Lot "C". See Figure 6 for proposed site plan for Tentative Tract #16136.

In addition to the new development, the project will include the relocation of North Shore Drive to allow development of lake front lots. A segment of approximately 2,498 feet of road will need to be relocated. The maximum distance of relocation, as designed, is 207 feet to the north. The design includes a 76-foot road width, with 14-foot shoulder/bikeway access, resulting in a 104 feet of right-of-way. Project access includes a loop road for the northerly project area, allowing 64 lots to access North Shore Drive. Thirty-one lots, south of North Shore Drive, would be accessed via another loop road, which includes five separate cul-de-sac drives to access lakefront lots.

3.2 Hydrology

Project hydrology was completed by Hicks & Hartwick, to determine the impacts that the new development will have on runoff. Hydrologic calculations to evaluate surface runoff associated with 10-year and 100-year hypothetical design storm frequencies from the tributary drainage areas were performed using 1983-1994 Advanced Engineering Software (AES), in accordance with San Bernardino County Hydrology Manual. The watershed subarea boundaries were delineated according to physical constraints from the topography, existing drainage facities and proposed developments. The Proposed Conditions Hydrology Map can be found in Figure 7. Hydrologic parameters used in the analysis, such as rainfall and soil classification, are as presented in the *San Bernardino County Hydrology Manual.*

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SOURCE: HICKS & HARTWICK, INC. PRELIMINARY DRAINAGE STUDY

RBF CONSULTING

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JOB No. 10-101901

SCALE 1" = 400'

MOON CAMP
LAND USE MAP
PROPOSED CONDITION

FIGURE 6

3.2.1 Proposed Watershed Description

The drainage pattern for the areas follow the natural topography, south to north with the flow draining into Big Bear Lake. The proposed project has some redirection of flow and the elimination of sheet flow across Highway 38. All cross-culverts are to be designed to handle the 100-year storm event.

Due to onsite drainage patterns, the proposed project site was split into ten areas (A through J). Area "A" is on the eastern portion and area "J" is on the western end of the watershed. In the proposed condition the watershed delineation slightly changes from the existing condition, due to grading and adding of impervious areas.

Table No. 5 – Proposed Condition Drainage Area Breakdown		
Drainage Area	**Area (acres)**	**Number of Subareas**
A	96.9	9
B	6.6	1
C	2.3	1
D	9.6	3
E	0.2	1
F	1.0	1
G	39.7	3
H	0.3	1
I	0.2	1
J	14.2	4

The subareas for the eight drainage areas are illustrated in Figure 7.

Table No. 6 – Proposed Subwatershed Characteristics			
Nodes	**Area (acres)**	**Length (feet)**	**Soil Type / Development Type**
Watershed A			
A1 – A2	3	779	D / Natural
A2 – A3	12.5	730	D / Natural
A3 – A7	29.7	869	D / Natural
A4 – A5	4.7	890	D / Natural
A5 – A6	17.3	719	D / Natural
A6 – A7	26.1	719	D / Natural
A7 – A8	79.0	1261	C / Natural
A8 – A9	91.0	462	C / 2.5 AC
A9 – A10	96.9	671	C / 1D AC
Watershed B			
B1 – B2	6.6	603	C / 1D AC
Watershed C			
C1 – C2	2.3	407	C / 2D AC
Watershed D			
D1 – D2	2.4	579	C / 2.5 AC
D2 – D3	7.6	620	C / 1D AC
D3 – D4	9.6	322	C / 1D AC

Table No. 6 – Proposed Subwatershed Characteristics			
Nodes	**Area (acres)**	**Length (feet)**	**Soil Type / Development Type**
Watershed E			
E1 – E2	0.2	280	C / Commercial
Watershed F			
F1 – F2	1.0	831	C / Commercial
Watershed G			
G1 – G2	4.1	848	C / Natural
G2 – G3	33.8	1298	C / Natural
G3 – G4	39.7	537	C / 1D AC
Watershed H			
H1 – H2	0.3	511	C / Commercial
Watershed I			
I1 – I2	0.2	248	C / Commercial
Watershed J			
J1 – J2	4.3	1050	C / 4D AC
J2 – J3	1.2	400	C / 1D AC
J3 – J4	7.2	212	C / 1D AC
J4 – J5	14.2	210	C / 1D AC

In the proposed condition drainage area "A" would be composed of 9 subareas. Approximately 80 acres of drainage area "A" would consist of natural area. Of that about 56 acres are on a soil type of D and the remaining is on a soil type of C. In the proposed condition approximately 18 acres would contain development proposed on the lakeshore side of the watershed. Approximately 12 acres will consist of 2.5-acre lots and the remaining 6 acres will contain one dwelling per acre.

Area "B" would consist of 1 subarea. This area would contain one dwelling unit per acre in the proposed condition.

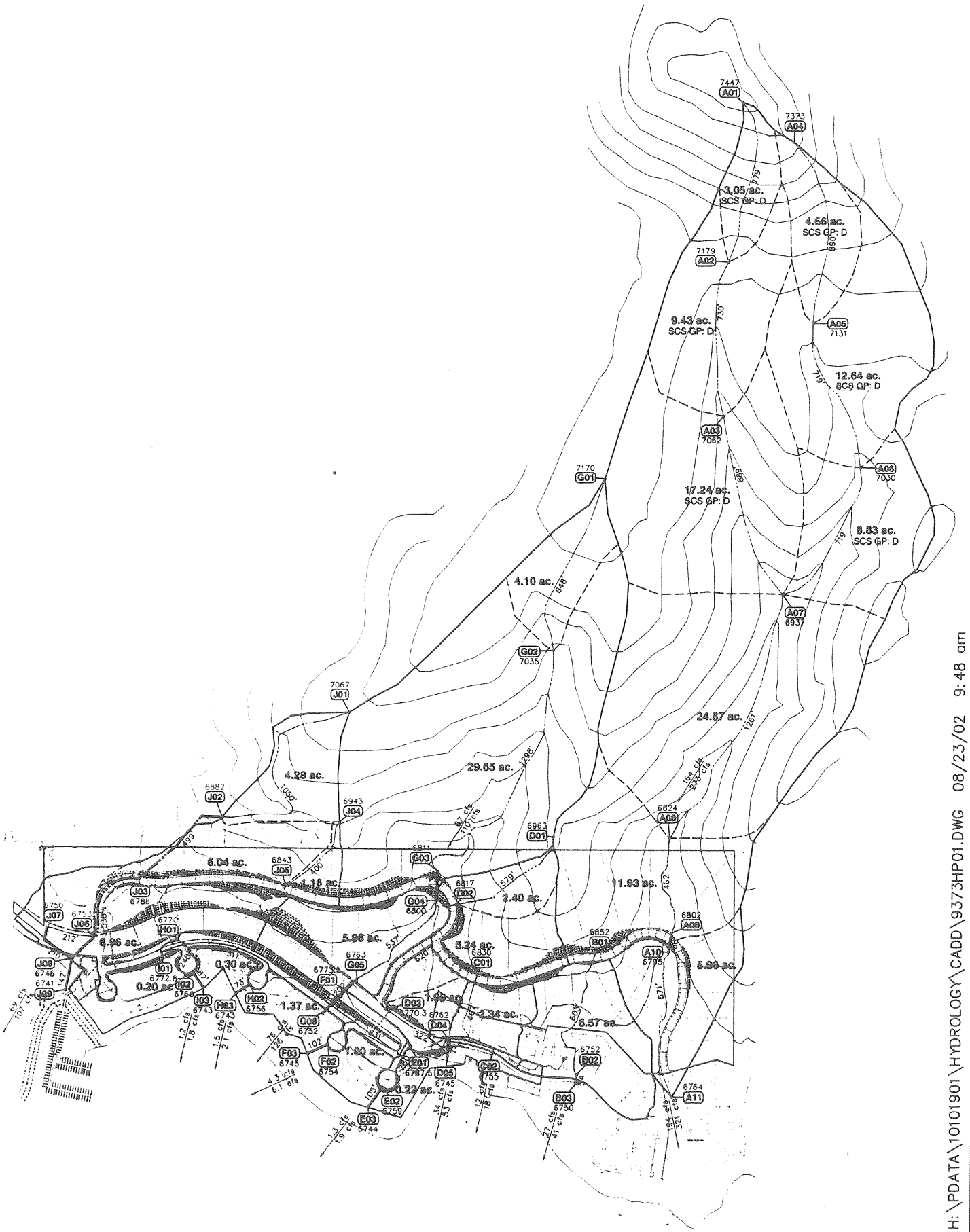
Area "C" would also contain 1 subarea. Within this drainage area the land would be composed of 2 dwellings units per acre.

Area "D" would be composed of 3 subareas. The upper subarea would contain 2.5 dwelling units per acre. The remaining subareas would contain one dwelling unit per acre.

Areas "E", "F", "H" and "I" would be composed of 1 subarea. These drainage areas would contain commercial dwellings.

Area "G" would be composed of 3 subareas. Approximately 34 acres would be natural land with no proposed development. On the remaining 6 acres, the land would consist of approximately one dwelling unit per acre.

Area "J" would be composed of 4 subareas. The upper 4.3 acres would contain 4 dwelling units per acre. The remaining 14.2 acres would contain approximately one dwelling unit per acre.



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SOURCE: HICKS & HARTWICK, INC. PRELIMINARY DRAINAGE STUDY

RBF CONSULTING
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JOB No. 10-101901

SCALE 1" = 600'

MOON CAMP
PROPOSED CONDITION
HYDROLOGY MAP

FIGURE 7

Approximately 35% of the overall watershed that contains Moon Camp will be developed. The 95-lots will contain custom homes along the north shore of Big Bear Lake. Table 7 shows the percent impervious values for the types of land uses on the project site. The values presented are from the *San Bernardino County Hydrology Manual.*

Table No. 7 – Percent Impervious Based on Land Use	
Land Use	**Percent Pervious**
One Dwelling per Acre	80%
Two Dwellings per Acre	60%
Four Dwellings per Acre	50%
2.5 Acre Lots	90%
Commercial	10%
Natural Area – Soil Type C	100%
Natural Area – Soil Type D	100%

3.2.2 Rational Method

The hydrologic calculations to determine the 10-year and 100-year peak flow rates were performed by Hicks & Hartwick Inc using the *San Bernardino County Hydrology Manual* dated May 1983. The Rational Method is an empirical computation procedures for developing a peak runoff rate (discharge) for storms of a specific recurrence interval. Rational Method equations are based on the assumption that the peak flowrate is directly proportional to the drainage area, rainfall intensity, and a loss coefficient, which describes the effects of land use and soil type. The design discharges were computed by generating a hydrologic "link-node" model, which divides the area into drainage subareas. These subareas are tributary to a concentration point or hydrologic "node" point determined by the existing terrain and street layout. The following assumptions/guidelines were applied for use of the Rational Method:

1. The Rational Method hydrology includes the effects of infiltration caused by soil surface characteristics. The soils map from the *San Bernardino County Hydrology Manual* indicates that the study area consists of soil types "C and D."

2. The infiltration rate is also affected by the type of vegetation or ground cover and percentage of impervious surfaces. The amount of imperviousness used for the proposed condition ranged from 0% for natural open areas, 10% to 50% for single family housing and 90% for commercial use.

3. The time of concentration (T_c) is determined from the *San Bernardino County Hydrology Manual.*

4. The gutter flow option was used to model the natural channel since the side slopes and Manning's "n" values can be changed.

5. Standard Intensity-Duration Curve data was obtained from the *San Bernardino County Hydrology Manual.*

3.2.3 Proposed Condition Surface Water Hydrology

Appendix B displays the results from the Hicks & Hartwick analysis for the 10-year and the 100-year storm events for the proposed condition. Results of the proposed condition hydrologic analysis are summarized in the following table.

Table No. 8 – Proposed Condition Peak Flow Rate

Subarea	Area (acres)	Total Area (acres)	Tc (min)	Total 10-Yr. Peak Q (cfs)	Total 100-Yr. Peak Q (cfs)
Watershed A					
A1 – A2	3.0	3	16.6	7.8	12.2
A2 – A3	9.4	12.5	17.8	30.3	48.4
A3 – A7	17.2	29.7	18.8	69.0	111.0
A4 – A5	4.7	4.7	18.4	11.0	17.4
A5 – A6	12.6	17.3	19.2	39.4	62.5
A6 – A7	8.8	26.1	20.1	57.4	91.6
A7 – A8	24.9	79.0	1.4	170.1	277.3
A8 – A9	11.9	91.0	0.7	189.9	311.6
A9 – A10	6.0	96.9	1.0	194.3	321.0
Watershed B					
B1 – B2	6.6	6.6	8.7	27.5	41.5
Watershed C					
C1 – C2	2.3	2.3	6.8	11.9	17.7
Watershed D					
D1 – D2	2.4	2.4	8.2	10.4	15.8
D2 – D3	5.2	7.6	9.8	29.1	45.1
D3 – D4	2.0	9.6	10.7	34.1	53.5
Watershed E					
E1 – E2	0.2	0.2	5.8	1.3	1.9
Watershed F					
F1 – F2	1.0	1.0	9.5	4.3	6.1
Watershed G					
G1 – G2	4.1	4.1	20.0	8.6	14.1
G2 – G3	29.6	33.8	21.4	66.7	110.2
G3 – G4	6.0	39.7	22.3	76.1	126.0
Watershed H					
H1 – H2	0.3	0.3	7.6	1.5	2.1
Watershed I					
I1 – I2	0.2	0.2	5.7	1.2	1.8
Watershed J					
J1 – J2	4.3	4.3	9.4	17.3	25.7
J2 – J3	1.2	1.2	6.8	5.9	8.7
J3 – J4	6.0	7.2	9.6	28.0	43.6
J4 – J5	7.0	14.2	10.3	51.9	81.3

The proposed condition has more impervious areas than the existing condition. The change in impervious area would have the potential to cause significant downstream impacts. In the proposal for Tract # 16136 Hicks & Hartwick have proposed to upsized the cross culverts to contain the 100-year storm water flow along Highway 38 and eliminate sheet flow across the highway. They have also proposed to add catch basins and cross culverts along the residential roads. All flow would be directed into the Big Bear Lake, similar to current condition. From the existing condition, the overall watershed flow rate in the proposed condition increases 8.7 cfs in the 10-year storm event and an 9.5 cfs in the 100-year storm event. This was determined by subtracting the total runoff in the proposed condition from the existing condition.

3.3 Floodplain Mapping

Since the project is not in a floodplain, the proposed development will not impact any existing floodplains.

3.4 Jurisdictional Waters

Based on a field survey conducted on March 15, 2002 by RBF Consulting, it was determined that of 0.15 acres of jurisdictional waters, 0.04 acres will be impacted.

3.5 Storm Water Quality

At the time of the analysis there was no storm water quality plan for Moon Camp Tentative Track # 16136. A Water Quality Management Plan will need to be developed for the Moon Camp property under the guidelines in the *Water Quality Management Plan (WQMP) For Urban Runoff* prepared by San Bernardino County. The WQMP conforms to the new National Pollutant Discharge Elimination System (NPDES) permit requirement for San Bernardino County effective as of June 2004.

3.5.1 Construction

Construction of a project such as Moon Camp development typically produces potential pollutants such as nutrients, heavy metals, pesticides and herbicides, toxic chemicals related to construction and cleaning, waste materials including wash water, paints, wood, paper, concrete, food containers, and sanitary wastes, fuel, and lubricants.

3.6 Groundwater

3.7 Cumulative Projects

The basis for the cumulative analysis as presented in the Moon Camp TT # 16136 Environmental Impact Report. For the purposes of drainage and water quality analysis, commutative impacts are considered for projects in the same watershed as Moon Camp. Tract 12217 (Marina Point), Tract 15465 (Kelsch) and Relocation of the Moonridge Zoo adjacent to the Discovery Center are all in the same watershed or adjacent watersheds as Moon Camp. All 3 of these cumulative projects drain into Big Bear Lake and will have to comply with the same TMDL standards and the Water Quality Management Plan for Urban Runoff as outlined in the Santa Ana Regions NPDES Permit and Water Discharge Requirements. Therefore, the cumulative impacts and mitigation for the project would be limited to those associated with Moon Camp project.

4.0 PROPOSED MITIGATION

Mitigation is required to reduce impacts due to the development of Moon Camp Tentative Tract 16136. The following section discussed both storm water conveyance and storm water quality mitigation measures that will need to be addressed to bring the proposed impacts to a less than significant level.

4.1 Hydrologic Impacts

The Moon Camp Development will result in an increase in impervious areas on site. There is a net increase of 8.7 cfs in the 10-year storm event and 9.5 cfs in the 100-year storm will flow into Big Bear Lake. The developer plans on placing cross culverts and catch basins along the road to catch the storm water, to prevent flooding and erosion onsite. In addition, the cross culverts under Highway 38 will be sized to contain the 100-year storm event. All runoff flows would be outleted into Big Bear Lake.

4.1.1 Hydrologic Mitigation

Provided that the proposed cross culverts are sized for 100-year burn and bulking flow rates. The burn and bulking method will increase the runoff from the natural areas. San Bernardino County Hydrology Manual does not contain a burning and bulking method, therefore the method found in the Los Angeles County Hydrology Manual is recommended. In addition, the cross culverts should all be designed with headwalls to prevent CMP crushing, and maintained adequately. No additional hydrologic mitigation is required.

4.2 Floodplain Impacts

The proposed development does not impact any mapped flood plains. Moon Camp is defined by the Federal Emergency Management Agency as an area outside of the 100-year and 500-year flood zones. No mitigation is proposed.

4.3 Jurisdictional Water Impacts

The project will impact the riparian habitat associated with the development of Tract #16136. This impact will require mitigation in the form of resource agency permitting.

4.3.1 Resource Agency Permitting

The project would likely have to obtain the following permits for the expansion project:

1. U.S. Army Corps of Engineers 404 Permit
2. Santa Ana Regional Water Quantity Control Board – Clean Water Act Section 401 Permit.
3. California State Water Resource Control Board – General Storm Water Permit for Construction and Storm Water Pollution Prevention Plan (SWPPP)
4. California Department of Fish and Game Section 1603 Streambed Alteration Agreement

4.4 Water Quality Impacts

The development of Tract # 16136 will increase the impervious area, which will impact storm water quality. The project will increase pollutant loading in Big Bear Lake, which is immediately offsite. The lake is impaired due to the following pollutants: copper, mercury, metals, noxious aquatic plants, nutrients, and sediment and siltation. The 303(d) list currently indicates that all of the listed pollutants are a "high" priority. A "high" priority indicates that the receiving water body will be subject to Total Maximum Loads (TMDL) by the year 2005. Based on the current Draft 303(d) list it appears that the Santa Ana Regional Water Quality Control Board is currently developing TMDLs for Big Bear Lake. Therefore, the proposed mitigation should focus on meeting potential TMDLs for Big Bear Lake. Mitigation is required for water quality impacts. Mitigation must include the development of a Water Quality Management Plan (WQMP) containing both structural and non-structural Best Management Practices (BMPs). The WQMP will be based on the San Bernardino County WQMP guidelines and NPDES permits that will be in effect as of January 2004(As discussed in Section 1.2).

4.4.1 Non-Structural and Source Control BMPs Mitigation

The Water Quality Management Plan must be developed, which includes both Non-Structural and Source Control BMPs. The development of the WQMP must conform to the San Bernardino County Draft NPDES permit and the WQMP standards.

The following are the minimum required mitigation from the *Water Quality Management Plan (WQMP) for Urban Runoff.*

Education for Property Owners, Tenants and Occupations – The Property Owners Association is required to provide awareness educational material, including information provided by San Bernardino County. The materials will include a description of chemicals that should be limited to the property and proper disposal, including prohibition of hosing waste directly to gutters, catch basins, storm drains or the lake.

Activity Restrictions – The developer will prepare conditions, covenants and restriction of the protection of surface water quality.

Common Area Landscape Management – For the common landscape areas ongoing maintenance consistent with County Administrative Design Guidelines or city equivalent, plus fertilizer and pesticide usage consistent with the instructions contained on product labels and with regulation administered by the State Department of Pesticide Regulation or county equivalent.

Common Area Catch Basin Inspection – Property Owners Associations are required to have privately owned catch basins cleaned and maintained, as needed. To prevent sediment, garden waste, trash and other pollutants from entering the public streets and storm drain systems.

Common Area Litter Control – POAs are required to implement trash management and litter control procedures to minimize pollution to drainage waters.

Street Sweeping Private Streets and Parking Lots – Streets and Parking lots need to be sweeped as needed, to prevent sediment, garden waste, trash and other pollutants from entering the public streets and storm drain systems.

The following are proposed mitigations from the *California Storm Water Best Management Practice Handbook - Municipal*:

SC10 Housekeeping Practices - This entails practices such as cleaning up spills, proper disposal of certain substances and wise application of chemicals.

SC32 Used Oil Recycling - May apply to maintenance and security vehicles.

SC72 Vegetation Controls – Vegetation control typically includes chemical (herbicide) application and mechanical methods. Chemical methods are discussed in SC10. Mechanical methods include leaving existing vegetation, cutting less frequently, hand cutting, planting low maintenance vegetation, collecting and properly disposing of clippings and cuttings, and educating employees and the public.

SC73 Storm Drain Flushing - Although general storm drain gradients are sufficiently steep for self-cleansing, visual inspection may reveal a buildup of sediment and other pollutants at the inlets or outlets, in which case flushing may be advisable.

4.4.2 Structural/Treatment BMPs Mitigation

The Water Quality Management Plan (WQMP) includes Structural or Treatment BMPs. The structural BMPs utilized should focus on meeting potential TMDL requirements for noxious aquatic plants, nutrients, sedimentation and siltation. The structural BMPs should conform to the San Bernardino County NPDES permit and the San Bernardino WQMP standards.

The WQMP guidelines contained in the *Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements* for San Bernardino County states that Structural BMPs will be required for all new developments. They will be sized to comply with one of the following numeric sizing criteria or be considered by the permittees to provide equivalent or better treatment.

Volume Based BMPs shall be designed to infiltrate or treat either:

1. The volume of runoff produced from the 85th percentile 24-hour storm event, as determined from the local historical rainfall record; or
2. The volume of the annual runoff produced by the 85th percentile 24-hours rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or
3. The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practice Handbook – Industrial/Commercial (1993); or
4. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event.

OR

Flow –based BMPs shall be designed to infiltrate or treat either:

1. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or
2. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or
3. The maximum flow rate of runoff, as determined from the local historical rainfall record that achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied be a factor of two.

The following are the minimum required mitigation from the *Water Quality Management Plan (WQMP) for Urban Runoff.*

Control of Impervious Runoff – Surface runoff shall be directed to landscape areas or pervious areas.

Common area Efficient Irrigation – Physical implementation of landscape plan consistent with County Administrative Design Guidelines or city equivalent, which may include provision of water sensors, programmable irrigation times, etc.

Common Area Runoff-Minimizing Landscape Design – Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration.

Catch Basin Stenciling – Put "No Dumping – Flows to Lake" or equivalent effective phrase, to be stenciled on catch basins to alert the public as to the destination of pollutant discharging into storm drain.

Debris Posts – Are necessary to prevent large floatable debris from entering the storm drains. They are place upstream of the cross culverts.

Inlet Trash Racks – Where appropriate to reduce intake and transport through the storm drain system of large floatable debris, trash racks shall be provided where drainage from open areas entering storm drain or cross culverts.

Since no treatment BMPs are currently proposed on site, the mitigation for storm water treatment under the NPDES Permit and the future TMDL requirements will require the construction of treatment BMPs. The Treatment BMPs appropriate for onsite use are infiltration trenches and basins, swales, inlet filtration, and/or water quality basins. The mitigation requires that all storm water runoff be treated before leaving the site to reduce pollutants in Big Bear Lake. It is possible that by the time the project is developed that the site will be subject to TMDL requirements.

Infiltration Trenches and Basins

Infiltration Trenches and/or Basins may be used on site to meet potential future TMDLs for noxious aquatic plants and nutrients. Infiltration trenches and basins treat storm water runoff through filtration. A typical infiltration trench is essentially an excavated trench, which is lined with filter fabric and backfilled with stones. Depth of the infiltration trench ranges from 3 to 8 feet and functions best in areas with permeable soils, and water table and bedrock depth situated well below the bottom of the trench. Trenches should not be used to trap coarse sediments, because large sediment will

likely clog the trench. Grass buffers can be installed to capture sediment before it enters the trench to minimize clogging. Infiltration basins are generally used for drainage areas between 5 to 50 acres. Infiltration basins can be either in-line or off-line, and may treat different volumes such as the water quality volume or the 2-year or 10-year storm.

Swales

One appropriate treatment is either vegetative swales, enhanced vegetated swales utilizing check dams and wide depressions, a series of small detention facilities designed similarly to a dry detention basin, or a combination of these treatment methods into a treatment train (A series of Structural BMPs). It is essential that the Water Quality Management Plan address treatment for Moon Camp to assure that the runoff from the site be treated to the "maximum extent practicable".

In order for the vegetation swales to be effective in the removal of potential pollutants, the swales must be treated as water quality features and must be maintained differently than grass areas. Specifically, pesticides, herbicide, and fertilizers, which may be used on the grass areas, must not be used in the vegetation swales.

Filtration

Another appropriate treatment is filtration, which could be accomplished using drop-in infiltration devices or inline devices.

Drop-infiltration devices at all curb inlets within the internal parking lots could provide potential pollutant removal. Existing examples of these filtration devices include the Drain Pac Storm Drain Inserts and Fossil Filters. These types of devices are efficient at removing oil and grease, debris, and suspended solids from treated waters. Some of these devices have also exhibited high efficiencies at removing heavy metals and other pollutants.

Inline devices suggested for use onsite include the Continuous Deflection Separator (CDS® unit). Once the runoff has entered the storm drain, an in-line diversion will direct the treatment flow to a CDS® unit. The CDS® unit is a non-blocking, non-mechanical screening system, which will provide a second line of defense for solids removal. Adsorption materials can be added within the CDS® unit to aid in the removal of oil and grease. The treated flow will exit the CDS® unit and continue downstream.

To assure the efficiency of these filtration devices, monitoring is necessary. The use of street sweeps on the parking lots and streets will help reduce the amounts of sediment and debris that flow through the devices. This will extend the effectiveness of the devices during a storm and will lower the frequency of required maintenance. Even so, the devices should be checked and cleaned, if necessary, once a month during the rainy season, following any precipitation and at the end of the dry season prior to the first precipitation event of the rainy season.

These filtration units could potentially be used in other areas besides the parking lot inlets. Another potential locations is at the downstream end of the tributary pipes that feed the discharge point. Sitting these units a downstream point will allow for the treatment of more runoff.

Water Quality / Extended Detention Basin

Another effective mitigation measure for impacts to water quality is the construction of a water quality basin. The purpose of the extended detention basin is to aid in the removal mechanism: settling or sedimentation; adsorption to sediments, vegetation, or detritus: filtration by plants; microbial uptake and/or transformation; and uptake by wetland plants or algae. The removal of the urban runoff pollutants occurs during the slow draining of the basin (minimum 24-hours).

Water Quality Basins are expected to reduce the following pollutants: total suspended solids, total phosphorous, total nitrogen, chemical oxygen demand (COD), total lead, total zinc, total copper, and bacteria. This will help reduce the pollutants entering Big Bear Lake.

4.4.3 Construction Erosion Controls Mitigation

Construction controls are separated from the rest of the water quality management because the measures are temporary and specific to the type of construction. Construction of a project such as Moon Camp development typically produces potential pollutants such as nutrients, heavy metals, pesticides and herbicides, toxic chemicals related to construction and cleaning, waste materials including wash water, paints, wood, paper, concrete, food containers, and sanitary wastes, fuel, and lubricants.

As part of its compliance the NPDES requirements, a Notice of Intent (NOI) will need to be prepared and submitted to the Santa Ana Regional Water Quality Control Board providing notification and intent to comply with the State of California general permit. Prior to construction, a Storm Water Pollution Prevention Plan (SWPPP) must be completed for the construction activities onsite. A copy of the SWPPP must be available and implemented at the construction site at all times. The SWPPP outlines the source control and/or treatment control BMPs that will avoid or mitigate runoff pollutants at the construction site to the "maximum extent practicable".

From the *California Storm Water Best Management Practice Handbook - Construction Activity:*

CA 1 Dewatering Operations – This operation requires the use of sediment controls to prevent or reduce the discharge of pollutant to storm water from dewatering operations.

CA 2 Paving Operations – Prevent or reduce the runoff of pollutant from paving operations by proper storage of materials, protecting storm drain facilities during construction and training employees.

CA 3 Structural Construction and Painting – Keep site and area clean and orderly, use erosion control, use proper storage facilities, use safe products and train employees to prevent and reduce pollutant discharge to storm water facilities from construction and painting.

CA 10 Material Delivery and Storage – Minimize the storage of hazardous materials onsite. If stored onsite keep in designated areas, install secondary containment, conduct regular inspections and train employees.

CA 11 Material Use – Prevent and reduce the discharge of pesticides, herbicides, fertilizers, detergents, plaster, petroleum products and other hazardous materials from entering the storm water.

CA 20 Solid Waste Management - This BMP describes the requirements to properly design and maintain trash storage areas. The primary design feature requires the storage of trash in covered areas.

CA 21 Hazardous Waste Management - This BMP describes the requirements to properly design and maintain waste areas.

CA 23 Concrete Waste Management – Prevent and reduce pollutant discharge to storm water from concrete waste by performing on and off-site washouts in designated areas and training employees and consultants.

CA 24 Sanitary Septic Water Management – Provide convenient, well-maintained facilities, and arrange regular service and disposal of sanitary waste.

CA 30 Vehicle and Equipment Cleaning – Use off-site facilities, or wash in designated areas to reduce pollutant discharge into the storm drain facilities.

CA 31 Vehicle and Equipment Fueling – Use off-site facilities, or designated areas with enclosing or coverings to reduce pollutant discharge into the storm drain facilities.

CA 32 Vehicle and Equipment Maintenance – Use off-site facilities, or designated areas with enclosing or coverings to reduce pollutant discharge into the storm drain facilities. In addition run a "dry site" to prevent pollution discharge into storm drains.

CA 40 Employee and Subcontractor Training – Have a training session for employees and subcontractors to understand the need for implementation and usage of BMPs.

ESC 2 Preservation of Existing Vegetation – Minimize the removal of existing trees and shrubs because they serve as erosion control.

ESC 10 Seeding and Planting – Provide soil stability by planting and seeding grasses, trees, shrubs, vines, and ground cover.

ESC 11Mulching – Stabilize cleared or freshly seeded areas with mulch.

ESC 20 Geotextiles and Mats – Natural or synthetics material can be used for soil stability.

ESC Dust Control – Reduce wind erosion and dust generated by construction activities by using dust control measures.

ESC 23 Construction Road Stabilization – All on-site vehicle transport routes should be stabilized immediately after grading and frequently maintained to prevent erosion and control dust.

ESC 24 –Stabilized Construction Entrance – Stabilize the entrance pad to construction area to reduce amount of sediment tracked off site.

ESC 30 Earth Dikes – Construct earth dikes of compacted soil to divert runoff or channel water to a desired location.

ESC 31 Temporary Drains and Swales – Use temporary drains and swales to divert off-site runoff around the construction site, stabilized areas and direct it into sediment basins or traps.

ESC 40 Outlet Protection – Use rock or grouted rock at outlet pipes to prevent scouring of soil caused by high velocities.

ESC 41 Check Dams – Check dams reduce velocities of concentrated flows, thereby reducing erosion, and promoting sedimentation behind the dams. Check dams are small and placed across swales and drainage ditches.

ESC 50 Silt Fence – Composed of filter fabric, which have been entrenched, attached to support poles and sometimes backed by wire fence support. Silt fences promote sedimentation behind the fence of sediment-laden water.

ESC 51 Straw Bale Barrier – Place straw bales end to end in a level contour in a shallow trench and stake them in place. The bales will detain runoff and promote sedimentation.

ESC 52 Sand Bag Barriers – By stacking sand bags on a level contour, creates a barrier to detain sediment-laden water. The barrier will promote sedimentation.

ESC 53 Brush or Rock Filter – Made of ¾ to 3-inch diameter rocks place on a level contour or composed of brush wrapped in filter cloth and staked to the toe of the slope will provide a sediment trap.

ESC 54 Storm Drain Inlet Protection – Devises that remove sediment from sediment laden storm water before entering the storm drain inlet or catch basin.

ESC 55 Sediment Trap – A sediment trap is a small, excavated or bermed area where runoff for small drainage areas can pass through allowing sediment to settle out.

4.5 Groundwater Impacts

5.0 CONCLUSION

The development of Moon Camp Tract # 16136 will have less than significant impacts to Hydrology and Water Quality following the implementation of all mitigation described in Section 4.0.

Table No. 9 – Project Impact Evaluation		
Description of Impact Would the Project:	**Without Mitigation Impact**	**With Mitigation Impact?**
1. Violate any water quality standards or waste discharge requirements?	Potentially Significant Unless Mitigated	Less Than Significant Impact
2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?	Less Than Significant Impact	Less Than Significant Impact
3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?	Potentially Significant Unless Mitigated	Less Than Significant Impact
4. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?	Potentially Significant Unless Mitigated	Less Than Significant Impact
5. Create or contribute runoff water, which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	Potentially Significant Unless Mitigated	Less Than Significant Impact
6. Otherwise substantially degrade water quality?	Potentially Significant Unless Mitigated	Less Than Significant Impact
7. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or flood Insurance Rate Map or other flood hazard delineation map?	No Impact	No Impact
8. Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?	No Impact	No Impact

Table No. 9 – Project Impact Evaluation		
Description of Impact Would the Project:	**Without Mitigation Impact**	**With Mitigation Impact?**
9. Exposed people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	No Impact	No Impact
10. Inundation by seiche, tsunami, or mudflow?	Potentially Significant Unless Mitigated	Less Than Significant Impact
11. Change in absorption rate?	Less Than Significant Impact	Less Than Significant Impact
12. Change in the amount of surface water in any water body?	Less Than Significant Impact	Less Than Significant Impact
13. Change in the current, or course of direction of water movement?	Potentially Significant Unless Mitigated	Less Than Significant Impact
14. Altered direction or rate of flow of ground water?	Less Than Significant Impact	Less Than Significant Impact
15. Storm water discharges that would significantly impair the beneficial uses of receiving waters or areas that provide water quality benefits (e.g., riparian corridors, wetlands, etc.)?	Potentially Significant Unless Mitigated	Less Than Significant Impact
16. Harm to the biological integrity of drainage system and water bodies?	Potentially Significant Unless Mitigated	Less Than Significant Impact

The following discussion briefly explains the reasoning behind the impact evaluation in Table 9.

1. The project has the potential to violate water quality standards due to an increase in the level of activity on Moon Camp Tract # 16136. Without mitigation, Moon Camp would be expected to increase pollutant loadings, including hydrocarbons, fertilizers, and pesticides. The mitigation described in Section 4.0 includes a comprehensive Water Quality Management Plan (WQMP) for Urban Runoff, including both Structural and Non-Structural BMPs, which complies with the requirements made by the Santa Ana Regional Water Quality Control Board. This mitigation will reduce the potential impacts to a less than significant impact level.

2. The project site slightly decreases the pervious surface, however the groundwater table would not likely experience significant impacts due to the clayey soils onsite. In addition, by adding the water quality basin or infiltration trench the underground aquifers may have some recharge.

3. The proposed project will alter drainage areas and percent pervious areas on the Moon Camp site, which could be considered potentially significant to siltation and erosion potential unless mitigated. The proposed project includes storm drains, catch basins and cross culverts, which will reduce erosion. By placing inline filtration devices and water quality basins the suspended solids being deposited into Big Bear Lake will be reduces to a less then significant level.

4. The proposed project alters the drainage patterns on-site and slightly increases the amount of runoff leaving the site. Since the flow leaving the site will be contained in appropriately sized cross culverts and storm drain systems, there is no flooding on or off site.

5. The project creates runoff that has the potential to produce additional sources of polluted runoff as described in 1, above. The suggested water quality BMP's will reduce the impacts to a less than significant level.

6. The project has the potential to significantly impact water quality unless it is mitigated. See discussion in 1, above. Mitigation can reduce the impacts to a less than significant level.

7. There is no existing mapped flood hazard on-site. Therefore, there is no impact.

8. There is no existing mapped flood hazard on-site. Therefore, construction of the project would not place structures in a 100-year flood hazard area.

9. The proposed project contains adequate storm drain system to convey flows to the lake; therefore, no structures are expected to be affected by flooding. Also, no flooding hazard currently exist onsite resulting in no impacts.

10. The project is located in an area that has a potential to be affected by mudflows, in the natural areas with slopes greater then 33%. See discussion in Section 4 on "Burning and Bulking" . Mitigation can reduce the impacts to a less than significant level.

11. The absorption rate will not significantly change from existing to proposed condition due to the clayey content of onsite soils.

12. For the overall watershed there is an increase on 8.7 cfs in the 10-year storm and 9.5 cfs in a 100-year storm event. There is minimal change to the amount of surface water entering the lake. The additional flow is only two percent greater in the proposed condition than in the existing condition.

13. The direction of flow will alter due to proposed grading and changes in land uses. In the proposed project storm drains, catch basins and cross culverts are proposed providing less than significant level of impact.

14. There will be less then significant impacts to groundwater flow due to minor changes in impervious areas as discussed in 13, above.

15. The project is proposed in areas that will potentially contain riparian habitat. The area also discharges into Big Bear Lake, which is listed on the 303(d) list. Per the 303(d) list, the water body is impaired for various metals, noxious aquatic plants, nutrients, siltation and sedimentation. The Santa Ana Regional Board is currently developing TMDL standards for Big Bear Lake. It is anticipated that the Moon Camp project will have to conform to these future TMDLs by appropriate use of structural BMPs as outlined in Section 4.0. Mitigation associated with permit processing and development of the WQMP will reduce the impact to a less then significant level.

16. If the concentrated flows were not properly controlled and treated, the project would have the potential to harm biological integrity of the water body. The proposed storm drain and suggested treatment BMPs will reduce this impact to a less then significant level, see discussion in 15, above.

6.0 REFERENCES

Camp Dresser & McKee, et al., 1993. California Storm Water Best Management Practice Handbooks - Construction Activity. March 1993.

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San Bernardino County Department of Public Works, The County of San Bernardino, and Incorporated Cities of San Bernardino County within the Santa Ana Region. California Regional Water Quality Control Board Santa Ana Region National Pollutant Discharge Elimination System (NPDES) Permit and Water Discharge Requirements. Draft April 9, 2002.

San Bernardino County Stormwater Program. Guidelines for New Developments and Redevelopments. June 2000.

Moon Camp Tentative Tract 16136

APPENDIX A

Modified Rational Method - Existing Condition
10 year and 100 year

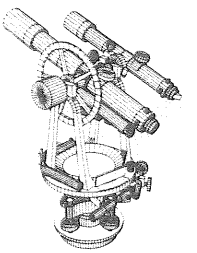
FAWNSKIN, CALIFORNIA
MOON CAMP
Tentative Tract 16136

PRELIMINARY DRAINAGE STUDY
HYDROLOGY AND HYDRAULICS
SUMMARY REPORT

APRIL 2002

EXHIBIT A
EXISTING HYDROLOGY

10-YEAR RUNOFF



Hicks & Hartwick, Inc.
CIVIL ENGINEERS - LAND SURVEYORS
37 EAST OLIVE AVENUE
REDLANDS, CALIFORNIA 92373
909.793.2257 or FAX 909.792.3763

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA A

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEAH.DAT
TIME/DATE OF STUDY: 11:20 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	3.0	3.0	D	Nat	..	16.6	4.60	.14	.140	12.2	779	.3440	..	INITIAL SUBAREA
5.0ft-GUTTER FLOW TO PT.# 3.00	9.4	12.5	D	Nat	.8	17.4	4.45	.14	.140	48.4	730	.1603	15.1	Qest.= 30.2cfs XFALL= .20000 n=.0300 D= 1.2
5.0ft-GUTTER FLOW TO PT.# 7.00	17.2	29.7	D	Nat	.9	18.3	4.29	.14	.140	111.0	869	.1438	17.1	Qest.= 80.5cfs XFALL= .20000 n=.0300 D= 1.4
7.00		29.7				18.3	4.29			111.0				FOR CONFLUENCE
5.00	4.7	4.7	D	Nat	..	18.4	4.29	.14	.140	17.4	890	.2719	..	INITIAL SUBAREA
5.0ft-GUTTER FLOW TO PT.# 6.00	12.6	17.3	D	Nat	.9	19.2	4.15	.14	.140	62.5	719	.1405	14.6	Qest.= 40.2cfs XFALL= .20000 n=.0300 D= 1.2
5.0ft-GUTTER FLOW TO PT.# 7.00	8.8	26.1	D	Nat	.8	20.0	4.04	.14	.140	91.6	719	.1293	15.8	Qest.= 77.9cfs XFALL= .20000 n=.0300 D= 1.4

CONFLUENCE ANALYSIS FOR POINT# 7.00

PEAK FLOW RATE(CFS) = 200.5
TIME OF CONCENTRATION(MIN.) = 18.3
MEAN VALUES: Fp(IN/HR) = .140; Ap = 1.000; Fm(IN/HR) = .140
EFFECTIVE AREA(ACRES) = 53.66 TOTAL AREA(ACRES) = 55.85

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
200.47	18.32	.140	1.00	.140	4.29	53.66	1.0
195.84	19.99	.140	1.00	.140	4.04	55.85	4.0

LARGEST CONFLUENCE Q= 200.5

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA A

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEAH.DAT
TIME/DATE OF STUDY: 11:20 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
5.0ft-GUTTER FLOW TO PT.# 8.00	24.9	78.5	C	Nat	1.3	19.6	4.09	.22	.165	277.3	1261	.0896	16.4	Qest.= 243.7cfs XFALL= .20000 n=.0300 D= 2.3
5.0ft-GUTTER FLOW TO PT.# 9.00	16.8	95.4	C	Nat	1.6	21.2	3.87	.22	.174	317.3	1233	.0487	13.1	Qest.= 305.0cfs XFALL= .20000 n=.0300 D= 2.7
9.00		95.4				21.2				317.3				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 95.36 TOTAL AREA(ACRES)= 97.55 PEAK FLOW RATE(CFS)= 317.33
TIME OF CONCENTRATION(MIN.)= 21.22 MEAN VALUES: Fp(IN/HR) = .174; Ap = 1.000; Fm(IN/HR) = .174

PEAK FLOW RATE TABLE

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
317.34	21.22	.174	1.00	.174	3.87	95.36	1.0
306.92	22.91	.173	1.00	.173	3.67	97.55	4.0

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA B

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEBH.DAT
TIME/DATE OF STUDY: 11:22 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	8.5	8.5	C	1D/AC	..	10.3	6.43	.22	.218	47.3	997	.1956	..	INITIAL SUBAREA
											34	.0588	12.1	Qpipe= 47.3cfs n=.0240 D= 1.9 30.0"-PIPE
3.00					.0									
3.00		8.5				10.3				47.3				STREAM SUMMARY

EFFECTIVE AREA(ACRES) = 8.46 TOTAL AREA(ACRES) = 8.46 PEAK FLOW RATE(CFS) = 47.26
TIME OF CONCENTRATION(MIN.) = 10.34 MEAN VALUES: Fp(IN/HR) = .272; Ap = .800; Fm(IN/HR) = .218

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA C

[SAN BERNARDINO COUNTY]

FILE NAME:9373HECH.DAT
TIME/DATE OF STUDY: 11:24 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	3.0	3.0	C	2.5AC	..	9.4	6.85	.24	.245	17.9	794	.2355	..	INITIAL SUBAREA
2.00		3.0			----	9.4				17.9	----	----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 3.01 TOTAL AREA(ACRES)= 3.01 PEAK FLOW RATE(CFS)= 17.88
TIME OF CONCENTRATION(MIN.)= 9.40 MEAN VALUES: Fp(IN/HR) = .272; Ap = .900; Fm(IN/HR) = .245

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA D

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEDH.DAT
TIME/DATE OF STUDY: 11:25 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	2.3	2.3	C	2.5AC	..	10.0	6.53	.24	.245	12.8	774	.1602	..	INITIAL SUBAREA
2.00		2.3			----	10.0				12.8	----	-----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 2.26 TOTAL AREA(ACRES)= 2.26 PEAK FLOW RATE(CFS)= 12.79
TIME OF CONCENTRATION(MIN.)= 10.05 MEAN VALUES: Fp(IN/HR) = .272; Ap = .900; Fm(IN/HR) = .245

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA E

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEEH.DAT
TIME/DATE OF STUDY: 11:26 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	1.5	1.5	C	Nat	..	19.9	4.05	.22	.218	5.0	683	.1069	..	INITIAL SUBAREA
2.00		1.5				19.9				5.0				STREAM SUMMARY

EFFECTIVE AREA(ACRES) = 1.45 TOTAL AREA(ACRES) = 1.45 PEAK FLOW RATE(CFS) = 5.00
TIME OF CONCENTRATION(MIN.) = 19.90 MEAN VALUES: Fp(IN/HR) = .218; Ap = 1.000; Fm(IN/HR) = .218

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA F

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEFH.DAT
TIME/DATE OF STUDY: 11:27 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	4.1	4.1	C	Nat	..	20.0	4.03	.22	.218	14.1	848	.1592	..	INITIAL SUBAREA
5.0ft-GUTTER FLOW TO PT.# 3.00	18.7	22.8	C	Nat	1.1	21.1	3.89	.22	.218	75.2	1044	.1935	17.3	Qest.= 44.4cfs XFALL= .20000 n=.0300 D= 1.2
5.0ft-GUTTER FLOW TO PT.# 4.00	22.1	44.9	C	Nat	1.5	22.5	3.71	.22	.218	141.1	1109	.0712	13.3	Qest.= 110.0cfs XFALL= .20000 n=.0300 D= 1.8
5.00					.1						51	.0588	15.9	Qpipe= 141.1cfs n=.0240 D= 2.8 45.0"-PIPE
5.00		44.9				22.6				141.1				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 44.88 TOTAL AREA(ACRES)= 44.88 PEAK FLOW RATE(CFS)= 141.09
TIME OF CONCENTRATION(MIN.)= 22.59 MEAN VALUES: Fp(IN/HR) = .218; Ap = 1.000; Fm(IN/HR) = .218

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA G

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEGH.DAT
TIME/DATE OF STUDY: 11:28 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	3.0	3.0	C	Nat	..	18.1	4.32	.22	.218	10.9	781	.2228	..	INITIAL SUBAREA
2.00		3.0			----	18.1				10.9	----	-----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 2.96 TOTAL AREA(ACRES)= 2.96 PEAK FLOW RATE(CFS)= 10.93
TIME OF CONCENTRATION(MIN.)= 18.13 MEAN VALUES: Fp(IN/HR) = .218; Ap = 1.000; Fm(IN/HR) = .218

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA H

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEHH.DAT
TIME/DATE OF STUDY: 11:29 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	9.4	9.4	C	2.5AC	..	9.6	6.72	.24	.245	54.6	833	.2281	..	INITIAL SUBAREA
2.00		9.4			....	9.6				54.6	....	.....	....	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 9.36 TOTAL AREA(ACRES)= 9.36 PEAK FLOW RATE(CFS)= 54.58
TIME OF CONCENTRATION(MIN.)= 9.64 MEAN VALUES: Fp(IN/HR) = .272; Ap = .900; Fm(IN/HR) = .245

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA I

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEIH.DAT
TIME/DATE OF STUDY: 11:30 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
					..						1050	.1762	..	INITIAL SUBAREA
2.00	4.3	4.3	C	4D/AC	----	9.4	6.83	.16	.163	25.7	----	-----	----	----------
											705	.1730	15.9	Qpipe= 25.7cfs
3.00														n=.0240 D= 1.0
					.7									24.0"-PIPE
3.00	1.8	6.1	C	2.5AC	----	10.2	6.48	.24	.188	34.7	----	-----	----	ADD SUBAREA
											292	.0514	9.2	Qest.= 48.9cfs
5.0ft-GUTTER FLOW TO PT.#														XFALL= .20000
					.6									n=.0300 D= 1.2
4.00	5.3	11.4	C	Nat	----	10.7	6.25	.22	.202	61.9	----	-----	----	----------
											73	.0274	9.8	Qpipe= 61.9cfs
5.00														n=.0240 D= 2.3
					.1									39.0"-PIPE
5.00		11.4			----	10.8				61.9	----	-----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES) = 11.38 TOTAL AREA(ACRES) = 11.38 PEAK FLOW RATE(CFS) = 61.91
TIME OF CONCENTRATION(MIN.) = 10.84 MEAN VALUES: Fp(IN/HR) = .242; Ap = .833; Fm(IN/HR) = .202

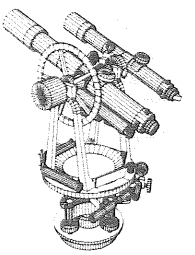
FAWNSKIN, CALIFORNIA
MOON CAMP
Tentative Tract 16136

PRELIMINARY DRAINAGE STUDY
HYDROLOGY AND HYDRAULICS
SUMMARY REPORT

APRIL 2002

EXHIBIT B
EXISTING HYDROLOGY

100-YEAR RUNOFF



Hicks & Hartwick, Inc.
CIVIL ENGINEERS - LAND SURVEYORS
37 EAST OLIVE AVENUE
REDLANDS, CALIFORNIA 92373
909.793.2257 or FAX 909.792.3763

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA A

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEAT.DAT
TIME/DATE OF STUDY: 11:20 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	3.0	3.0	D	Nat	.. ----	16.6	3.24	.40	.398	7.8	779	.3440	..	INITIAL SUBAREA
5.0ft-GUTTER FLOW TO PT.# 3.00	9.4	12.5	D	Nat	1.2 ----	17.8	3.09	.40	.398	30.3	730	.1603	15.1	Qest.= 19.3cfs XFALL= .20000 n=.0300 D= .8
5.0ft-GUTTER FLOW TO PT.# 7.00	17.2	29.7	D	Nat	1.0 ----	18.8	2.98	.40	.398	69.0	869	.1438	15.2	Qest.= 50.3cfs XFALL= .20000 n=.0300 D= 1.2
7.00		29.7			----	18.8	2.98			69.0	----	----	----	FOR CONFLUENCE
5.00	4.7	4.7	D	Nat	.. ----	18.4	3.02	.40	.398	11.0	890	.2719	..	INITIAL SUBAREA
5.0ft-GUTTER FLOW TO PT.# 6.00	12.6	17.3	D	Nat	.9 ----	19.2	2.93	.40	.398	39.4	719	.1405	14.1	Qest.= 25.2cfs XFALL= .20000 n=.0300 D= 1.2
5.0ft-GUTTER FLOW TO PT.# 7.00	8.8	26.1	D	Nat	.9 ----	20.1	2.84	.40	.398	57.4	719	.1293	13.8	Qest.= 49.1cfs XFALL= .20000 n=.0300 D= 1.2

CONFLUENCE ANALYSIS FOR POINT# 7.00

PEAK FLOW RATE(CFS) = 125.6
TIME OF CONCENTRATION(MIN.) = 18.8
MEAN VALUES: Fp(IN/HR) = .398; Ap = 1.000; Fm(IN/HR) = .398
EFFECTIVE AREA(ACRES) = 54.15 TOTAL AREA(ACRES) = 55.85

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
125.65	18.78	.398	1.00	.398	2.98	54.15	1.0
122.71	20.09	.398	1.00	.398	2.84	55.85	4.0

LARGEST CONFLUENCE Q= 125.6

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA A

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEAT.DAT
TIME/DATE OF STUDY: 11:20 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 2 OF 2

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
5.0ft-GUTTER FLOW TO PT.# 8.00	24.9	79.0	C	Nat	1.4	20.2	2.83	.52	.436	170.1	1261	.0896	15.0	Qest.= 151.5cfs XFALL= .20000 n=.0300 D= 1.9
5.0ft-GUTTER FLOW TO PT.# 9.00	16.8	95.9	C	Nat	1.7	21.9	2.67	.52	.450	191.5	1233	.0487	11.9	Qest.= 186.4cfs XFALL= .20000 n=.0300 D= 2.3
9.00		95.9				21.9				191.5				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 95.85 TOTAL AREA(ACRES)= 97.55 PEAK FLOW RATE(CFS)= 191.46
TIME OF CONCENTRATION(MIN.)= 21.94 MEAN VALUES: Fp(IN/HR) = .450; Ap = 1.000; Fm(IN/HR) = .450

PEAK FLOW RATE TABLE

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
191.46	21.94	.450	1.00	.450	2.67	95.85	1.0
185.53	23.26	.449	1.00	.449	2.56	97.55	4.0

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA B

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEBT.DAT
TIME/DATE OF STUDY: 11:47 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
					..						997	.1956	..	INITIAL SUBAREA
2.00	8.5	8.5	C	1D/AC	----	10.3	4.54	.45	.453	31.1	----	----	----	
											34	.0588	11.0	Qpipe= 31.1cfs
3.00					.1									n=.0240 D= 1.5 27.0"-PIPE
3.00		8.5			----	10.3				31.1	----	----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 8.46 TOTAL AREA(ACRES)= 8.46 PEAK FLOW RATE(CFS)= 31.08
TIME OF CONCENTRATION(MIN.)= 10.34 MEAN VALUES: Fp(IN/HR) = .566; Ap = .800; Fm(IN/HR) = .453

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA C

[SAN BERNARDINO COUNTY]

FILE NAME:9373HECT.DAT
TIME/DATE OF STUDY: 11:48 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	3.0	3.0	C	2.5AC	..	9.4	4.83	.51	.509	11.7	794	.2355	..	INITIAL SUBAREA
2.00		3.0				9.4				11.7				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 3.01 TOTAL AREA(ACRES)= 3.01 PEAK FLOW RATE(CFS)= 11.71
TIME OF CONCENTRATION(MIN.)= 9.40 MEAN VALUES: Fp(IN/HR) = .566; Ap = .900; Fm(IN/HR) = .509

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA D

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEDT.DAT
TIME/DATE OF STUDY: 11:48 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	2.3	2.3	C	2.5AC	..	10.0	4.61	.51	.509	8.3	774	.1602	..	INITIAL SUBAREA
2.00		2.3			----	10.0				8.3	----	-----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 2.26 TOTAL AREA(ACRES)= 2.26 PEAK FLOW RATE(CFS)= 8.34
TIME OF CONCENTRATION(MIN.)= 10.05 MEAN VALUES: Fp(IN/HR) = .566; Ap = .900; Fm(IN/HR) = .509

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA E

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEET.DAT
TIME/DATE OF STUDY: 11:49 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
					..						683	.1069	..	INITIAL SUBAREA
2.00	1.5	1.5	C	Nat	----	19.9	2.86	.52	.518	3.1	----	-----	----	
2.00		1.5			----	19.9				3.1	----	-----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 1.45 TOTAL AREA(ACRES)= 1.45 PEAK FLOW RATE(CFS)= 3.05
TIME OF CONCENTRATION(MIN.)= 19.90 MEAN VALUES: Fp(IN/HR) = .518; Ap = 1.000; Fm(IN/HR) = .518

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA F

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEFT.DAT
TIME/DATE OF STUDY: 11:49 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	4.1	4.1	C	Nat	..	20.0	2.84	.52	.518	8.6	848	.1592	..	INITIAL SUBAREA
5.0ft-GUTTER FLOW TO PT.# 3.00	18.7	22.8	C	Nat	1.1	21.1	2.74	.52	.518	45.6	1044	.1935	16.5	Qest.= 27.0cfs XFALL= .20000 n=.0300 D= 1.2
5.0ft-GUTTER FLOW TO PT.# 4.00	22.1	44.9	C	Nat	1.6	22.7	2.61	.52	.518	84.4	1109	.0712	12.2	Qest.= 66.4cfs XFALL= .20000 n=.0300 D= 1.5
5.00					.1						51	.0588	13.8	Qpipe= 84.4cfs n=.0240 D= 2.4 36.0"-PIPE
5.00		44.9			....	22.7				84.4	....	.....	....	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 44.88 TOTAL AREA(ACRES)= 44.88 PEAK FLOW RATE(CFS)= 84.43
TIME OF CONCENTRATION(MIN.)= 22.74 MEAN VALUES: Fp(IN/HR) = .518; Ap = 1.000; Fm(IN/HR) = .518

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA G

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEGT.DAT
TIME/DATE OF STUDY: 11:50 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	3.0	3.0	C	Nat	..	18.1	3.05	.52	.518	6.7	781	.2228	..	INITIAL SUBAREA
2.00		3.0				18.1				6.7				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 2.96 TOTAL AREA(ACRES)= 2.96 PEAK FLOW RATE(CFS)= 6.75
TIME OF CONCENTRATION(MIN.)= 18.13 MEAN VALUES: Fp(IN/HR) = .518; Ap = 1.000; Fm(IN/HR) = .518

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA H

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEHT.DAT
TIME/DATE OF STUDY: 11:50 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
					..						833	.2281	..	INITIAL SUBAREA
2.00	9.4	9.4	C	2.5AC	----	9.6	4.75	.51	.509	35.7	----	----	----	
2.00		9.4			----	9.6				35.7	----	----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES) = 9.36 TOTAL AREA(ACRES) = 9.36 PEAK FLOW RATE(CFS) = 35.69
TIME OF CONCENTRATION(MIN.) = 9.64 MEAN VALUES: Fp(IN/HR) = .566; Ap = .900; Fm(IN/HR) = .509

TRACT No. 16136 MOON CAMP (JN 9373)
EXISTING HYDROLOGY
AREA I

[SAN BERNARDINO COUNTY]

FILE NAME:9373HEIT.DAT
TIME/DATE OF STUDY: 11:51 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
					..						1050	.1762	..	INITIAL SUBAREA
2.00	4.3	4.3	C	4D/AC	----	9.4	4.82	.34	.340	17.3	----	----	----	----
											705	.1730	14.4	Qpipe= 17.3cfs
3.00					.8									n=.0240 D= .8
3.00	1.8	6.1	C	2.5AC	----	10.2	4.55	.51	.391	22.9	----	----	----	24.0"-PIPE
											292	.0514	8.4	ADD SUBAREA
5.0ft-GUTTER														Qest.= 32.0cfs
FLOW TO PT.#														XFALL= .20000
4.00	5.3	11.4	C	Nat	.6 ----	10.8	4.37	.52	.450	40.2	----	----	----	n=.0300 D= 1.0
											73	.0274	8.8	Qpipe= 40.2cfs
5.00					.1									n=.0240 D= 2.0
														33.0"-PIPE
5.00		11.4			----	11.0				40.2	----	----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES) = 11.38 TOTAL AREA(ACRES) = 11.38 PEAK FLOW RATE(CFS) = 40.16
TIME OF CONCENTRATION(MIN.) = 10.99 MEAN VALUES: Fp(IN/HR) = .539; Ap = .833; Fm(IN/HR) = .450

Moon Camp Tentative Tract 16136

APPENDIX B

Modified Rational Method - Proposed Condition
10 year and 100 year

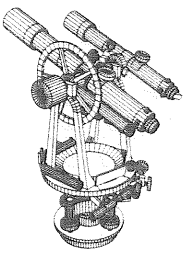
FAWNSKIN, CALIFORNIA
MOON CAMP
Tentative Tract 16136

PRELIMINARY DRAINAGE STUDY
HYDROLOGY AND HYDRAULICS
SUMMARY REPORT

APRIL 2002

EXHIBIT C
PROPOSED HYDROLOGY

10-YEAR RUNOFF



Hicks & Hartwick, Inc.
CIVIL ENGINEERS - LAND SURVEYORS
37 EAST OLIVE AVENUE
REDLANDS, CALIFORNIA 92373
909.793.2257 or FAX 909.792.3763

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA A

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPAT.DAT
TIME/DATE OF STUDY: 9:28 4/10/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 2

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	3.0	3.0	D	Nat	..	16.6	3.24	.40	.398	7.8	779	.3440	..	INITIAL SUBAREA
5.0ft-GUTTER FLOW TO PT.# 3.00	9.4	12.5	D	Nat	1.2	17.8	3.09	.40	.398	30.3	730	.1603	15.1	Qest.= 19.3cfs XFALL= .20000 n=.0300 D= .8
5.0ft-GUTTER FLOW TO PT.# 7.00	17.2	29.7	D	Nat	1.0	18.8	2.98	.40	.398	69.0	869	.1438	15.2	Qest.= 50.3cfs XFALL= .20000 n=.0300 D= 1.2
7.00		29.7				18.8	2.98			69.0				FOR CONFLUENCE
5.00	4.7	4.7	D	Nat	..	18.4	3.02	.40	.398	11.0	890	.2719	..	INITIAL SUBAREA
5.0ft-GUTTER FLOW TO PT.# 6.00	12.6	17.3	D	Nat	.9	19.2	2.93	.40	.398	39.4	719	.1405	14.1	Qest.= 25.2cfs XFALL= .20000 n=.0300 D= 1.2
5.0ft-GUTTER FLOW TO PT.# 7.00	8.8	26.1	D	Nat	.9	20.1	2.84	.40	.398	57.4	719	.1293	13.8	Qest.= 49.1cfs XFALL= .20000 n=.0300 D= 1.2

CONFLUENCE ANALYSIS FOR POINT# 7.00

PEAK FLOW RATE(CFS) = 125.6
TIME OF CONCENTRATION(MIN.) = 18.8
MEAN VALUES: Fp(IN/HR) = .398; Ap = 1.000; Fm(IN/HR) = .398
EFFECTIVE AREA(ACRES) = 54.15 TOTAL AREA(ACRES) = 55.85

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
125.65	18.78	.398	1.00	.398	2.98	54.15	1.0
122.71	20.09	.398	1.00	.398	2.84	55.85	4.0

LARGEST CONFLUENCE Q= 125.6

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA A

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPAT.DAT
TIME/DATE OF STUDY: 9:28 4/10/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 2 OF 2

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
5.0ft-GUTTER FLOW TO PT.# 8.00	24.9	79.0	C	Nat	1.4 ----	20.2	2.83	.52	.436	170.1	1261	.0896	15.0	Qest.= 151.5cfs XFALL= .20000 n=.0300 D= 1.9
5.0ft-GUTTER FLOW TO PT.# 9.00	11.9	91.0	C	2.5AC	.7 ----	20.9	2.77	.51	.445	189.9	462	.0476	11.8	Qest.= 182.2cfs XFALL= .20000 n=.0300 D= 2.3
10.00					.1						86	.0814	19.4	Qpipe= 189.9cfs n=.0240 D= 2.9 48.0"-PIPE
5.0ft-GUTTER FLOW TO PT.# 11.00	6.0	96.9	C	1D/AC	1.0 ----	21.9	2.67	.45	.446	194.3	671	.0462	11.7	Qest.= 195.8cfs XFALL= .20000 n=.0300 D= 2.4
11.00		96.9			----	21.9				194.3	----	-----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 96.91 TOTAL AREA(ACRES)= 98.61 PEAK FLOW RATE(CFS)= 194.30
TIME OF CONCENTRATION(MIN.)= 21.89 MEAN VALUES: Fp(IN/HR) = .457; Ap = .975; Fm(IN/HR) = .446

PEAK FLOW RATE TABLE

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
194.30	21.89	.457	.98	.446	2.67	96.91	1.0
188.25	23.21	.456	.98	.445	2.57	98.61	4.0

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA B

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPBT.DAT
TIME/DATE OF STUDY: 9:31 4/10/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	6.6	6.6	C	1D/AC	..	8.7	5.10	.45	.453	27.5	603	.1658	..	INITIAL SUBAREA
											34	.0588	10.5	Qpipe= 27.5cfs n=.0240 D= 1.6 24.0"-PIPE
3.00					.1									
3.00		6.6			....	8.8				27.5	....	.....	....	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 6.57 TOTAL AREA(ACRES)= 6.57 PEAK FLOW RATE(CFS)= 27.49
TIME OF CONCENTRATION(MIN.)= 8.75 MEAN VALUES: Fp(IN/HR) = .566; Ap = .800; Fm(IN/HR) = .453

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA C

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPCT.DAT
TIME/DATE OF STUDY: 6:28 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	2.3	2.3	C	2D/AC	..	6.8	6.06	.40	.396	11.9	407	.1843	..	INITIAL SUBAREA
2.00		2.3			----	6.8				11.9	----	-----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 2.34 TOTAL AREA(ACRES)= 2.34 PEAK FLOW RATE(CFS)= 11.94
TIME OF CONCENTRATION(MIN.)= 6.80 MEAN VALUES: Fp(IN/HR) = .566; Ap = .700; Fm(IN/HR) = .396

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA D

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPDT.DAT
TIME/DATE OF STUDY: 6:35 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
					..						579	.2522	..	
2.00	2.4	2.4	C	2.5AC	----	8.2	5.33	.51	.509	10.4	----	----	----	INITIAL SUBAREA
											620	.0753	7.5	Qest.= 20.5cfs
26.ft-STREET FLOW TO PT.#														D= .4 ,D*V= 2.8
					1.6									FLOODWIDTH=-1.8
3.00	5.2	7.6	C	1D/AC	----	9.8	4.71	.45	.471	29.1	----	----	----	
											322	.0258	5.8	Qest.= 32.6cfs
26.ft-STREET FLOW TO PT.#														D= .5 ,D*V= 2.7
					.9									FLOODWIDTH= 3.2
4.00	2.0	9.6	C	1D/AC	----	10.7	4.41	.45	.467	34.1	----	----	----	
											75	.2267	18.6	Qpipe= 34.1cfs
														n=.0240 D= 1.2
5.00					.1									21.0"-PIPE
5.00		9.6			----	10.8				34.1	----	----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 9.59 TOTAL AREA(ACRES)= 9.59 PEAK FLOW RATE(CFS)= 34.05
TIME OF CONCENTRATION(MIN.)= 10.77 MEAN VALUES: Fp(IN/HR) = .566; Ap = .825; Fm(IN/HR) = .467

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA E

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPET.DAT
TIME/DATE OF STUDY: 6:44 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	.2	.2	C	Com	..	5.8	6.75	.06	.057	1.3	280	.0304	..	INITIAL SUBAREA
3.00					.3						105	.1429	6.6	Qpipe= 1.3cfs n=.0240 D= .3 18.0"-PIPE
3.00		.2				6.1				1.3				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= .22 TOTAL AREA(ACRES)= .22 PEAK FLOW RATE(CFS)= 1.33
TIME OF CONCENTRATION(MIN.)= 6.09 MEAN VALUES: Fp(IN/HR) = .566; Ap = .100; Fm(IN/HR) = .057

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA F

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPFT.DAT
TIME/DATE OF STUDY: 6:45 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	1.0	1.0	C	Com	..	9.5	4.80	.06	.057	4.3	831	.0235	..	INITIAL SUBAREA
											102	.0882	7.8	Qpipe= 4.3cfs n=.0240 D= .5 18.0"-PIPE
3.00					.2									
3.00		1.0			..	9.7				4.3				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 1.00 TOTAL AREA(ACRES)= 1.00 PEAK FLOW RATE(CFS)= 4.27
TIME OF CONCENTRATION(MIN.)= 9.69 MEAN VALUES: Fp(IN/HR) = .566; Ap = .100; Fm(IN/HR) = .057

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA G

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPGT.DAT
TIME/DATE OF STUDY: 6:50 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	4.1	4.1	C	Nat	..	20.0	2.84	.52	.518	8.6	848	.1592	..	INITIAL SUBAREA
											1298	.1726	16.0	Qest.= 37.2cfs
5.0ft-GUTTER FLOW TO PT.# 3.00	29.6	33.8	C	Nat	1.4	21.4	2.71	.52	.518	66.7				XFALL= .20000 n=.0300 D= 1.2
											132	.0833	15.2	Qpipe= 66.7cfs
4.00					.1									n=.0240 D= 1.9 33.0"-PIPE
											537	.0689	11.8	Qest.= 72.6cfs
5.0ft-GUTTER FLOW TO PT.# 5.00	6.0	39.7	C	1D/AC	.8	22.3	2.64	.45	.508	76.1				XFALL= .20000 n=.0300 D= 1.5
											202	.0545	13.2	Qpipe= 76.1cfs
6.00					.3									n=.0240 D= 2.3 36.0"-PIPE
6.00		39.7				22.6				76.1				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 39.71 TOTAL AREA(ACRES)= 39.71 PEAK FLOW RATE(CFS)= 76.06
TIME OF CONCENTRATION(MIN.)= 22.59 MEAN VALUES: Fp(IN/HR) = .524; Ap = .970; Fm(IN/HR) = .508

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA H

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPHT.DAT
TIME/DATE OF STUDY: 6:56 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	.3	.3	C	Com	..	7.6	5.63	.06	.057	1.5	511	.0274	..	INITIAL SUBAREA
3.00					.2						73	.1781	7.4	Qpipe= 1.5cfs n=.0240 D= .3 18.0"-PIPE
3.00		.3			..	7.7				1.5				STREAM SUMMARY

EFFECTIVE AREA(ACRES) = .30 TOTAL AREA(ACRES) = .30 PEAK FLOW RATE(CFS) = 1.50
TIME OF CONCENTRATION(MIN.) = 7.73 MEAN VALUES: Fp(IN/HR) = .566; Ap = .100; Fm(IN/HR) = .057

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA I

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPIT.DAT
TIME/DATE OF STUDY: 6:56 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	.2	.2	C	Com	..	5.7	6.89	.06	.057	1.2	248	.0274	..	INITIAL SUBAREA
											87	.2644	8.0	Qpipe= 1.2cfs n=.0240 D= .2
3.00					.2									18.0"-PIPE
3.00		.2				5.8				1.2				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= .20 TOTAL AREA(ACRES)= .20 PEAK FLOW RATE(CFS)= 1.23
TIME OF CONCENTRATION(MIN.)= 5.84 MEAN VALUES: Fp(IN/HR) = .566; Ap = .100; Fm(IN/HR) = .057

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA J

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPJT.DAT
TIME/DATE OF STUDY: 7:11 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	4.3	4.3	C	4D/AC	..	9.4	4.82	.34	.340	17.3	1050	.1762	..	INITIAL SUBAREA
3.00					.6						499	.1884	14.8	Qpipe= 17.3cfs n=.0240 D= .8 24.0"-PIPE
8.00					.8						538	.0781	10.6	Qpipe= 17.3cfs n=.0240 D= 1.1 21.0"-PIPE
8.00		4.3				10.8	4.38			17.3				FOR CONFLUENCE
5.00	1.2	1.2	C	1D/AC	..	6.8	6.06	.45	.453	5.9	400	.2500	..	INITIAL SUBAREA
26.ft-STREET FLOW TO PT.# 6.00	6.0	7.2	C	1D/AC	2.8	9.6	4.77	.45	.453	28.0	1088	.0827	7.6	Qest.= 17.7cfs D= .4 ,D*V= 2.8 FLOODWIDTH=13.0
64.ft-STREET FLOW TO PT.# 7.00	7.0	14.2	C	1D/AC	.7	10.3	4.53	.45	.453	51.9	212	.0142	5.0	Qest.= 40.7cfs D= .8 ,D*V= 3.9 FLOODWIDTH=32.3
8.00					.4						210	.0190	8.2	Qpipe= 51.9cfs n=.0240 D= 2.3 39.0"-PIPE

CONFLUENCE ANALYSIS FOR POINT# 8.00

PEAK FLOW RATE(CFS) = 69.2
TIME OF CONCENTRATION(MIN.) = 10.7
MEAN VALUES: Fp(IN/HR) = .566; Ap = .754; Fm(IN/HR) = .427
EFFECTIVE AREA(ACRES) = 18.41 TOTAL AREA(ACRES) = 18.44

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
68.89	10.83	.566	.75	.427	4.38	18.44	1.0
69.18	10.74	.566	.75	.427	4.40	18.41	4.0

LARGEST CONFLUENCE Q= 69.2

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA J

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPJT.DAT
TIME/DATE OF STUDY: 7:11 4/11/2002
10.0-YEAR STORM RATIONAL METHOD STUDY (AMC II LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 2 OF 2

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
											142	.0352	11.1	Qpipe= 69.2cfs
9.00					.2									n=.0240 D= 2.3 39.0"-PIPE
9.00		18.4				11.0				69.2				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 18.41 TOTAL AREA(ACRES)= 18.44 PEAK FLOW RATE(CFS)= 69.18
TIME OF CONCENTRATION(MIN.)= 10.96 MEAN VALUES: Fp(IN/HR) = .566; Ap = .754; Fm(IN/HR) = .427

PEAK FLOW RATE TABLE

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
69.18	10.96	.566	.75	.427	4.34	18.41	4.0
68.89	11.04	.566	.75	.427	4.32	18.44	1.0

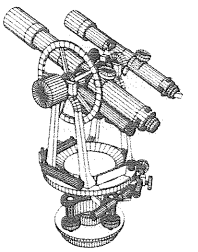
FAWNSKIN, CALIFORNIA
MOON CAMP
Tentative Tract 16136

PRELIMINARY DRAINAGE STUDY
HYDROLOGY AND HYDRAULICS
SUMMARY REPORT

APRIL 2002

EXHIBIT D
PROPOSED HYDROLOGY

100-YEAR RUNOFF



Hicks & Hartwick, Inc.
CIVIL ENGINEERS - LAND SURVEYORS
37 EAST OLIVE AVENUE
REDLANDS, CALIFORNIA 92373
909.793.2257 or FAX 909.792.3763

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA A

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPAH.DAT
TIME/DATE OF STUDY: 9:24 4/10/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 2

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	3.0	3.0	D	Nat	..	16.6	4.60	.14	.140	12.2	779	.3440	..	INITIAL SUBAREA
5.0ft-GUTTER FLOW TO PT.# 3.00	9.4	12.5	D	Nat	.8	17.4	4.45	.14	.140	48.4	730	.1603	15.1	Qest.= 30.2cfs XFALL= .20000 n=.0300 D= 1.2
5.0ft-GUTTER FLOW TO PT.# 7.00	17.2	29.7	D	Nat	.9	18.3	4.29	.14	.140	111.0	869	.1438	17.1	Qest.= 80.5cfs XFALL= .20000 n=.0300 D= 1.4
7.00		29.7				18.3	4.29			111.0				FOR CONFLUENCE
5.00	4.7	4.7	D	Nat	..	18.4	4.29	.14	.140	17.4	890	.2719	..	INITIAL SUBAREA
5.0ft-GUTTER FLOW TO PT.# 6.00	12.6	17.3	D	Nat	.9	19.2	4.15	.14	.140	62.5	719	.1405	14.6	Qest.= 40.2cfs XFALL= .20000 n=.0300 D= 1.2
5.0ft-GUTTER FLOW TO PT.# 7.00	8.8	26.1	D	Nat	.8	20.0	4.04	.14	.140	91.6	719	.1293	15.8	Qest.= 77.9cfs XFALL= .20000 n=.0300 D= 1.4

CONFLUENCE ANALYSIS FOR POINT# 7.00

PEAK FLOW RATE(CFS) = 200.5
TIME OF CONCENTRATION(MIN.) = 18.3
MEAN VALUES: Fp(IN/HR) = .140; Ap = 1.000; Fm(IN/HR) = .140
EFFECTIVE AREA(ACRES) = 53.66 TOTAL AREA(ACRES) = 55.85

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
200.47	18.32	.140	1.00	.140	4.29	53.66	1.0
195.84	19.99	.140	1.00	.140	4.04	55.85	4.0

LARGEST CONFLUENCE Q= 200.5

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA A

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPAH.DAT
TIME/DATE OF STUDY: 9:24 4/10/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 2 OF 2

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
											1261	.0896	16.4	Qest.= 243.7cfs
5.0ft-GUTTER FLOW TO PT.# 8.00	24.9	78.5	C	Nat	1.3 ----	19.6	4.09	.22	.165	277.3	----	-----	----	XFALL= .20000 n=.0300 D= 2.3
											462	.0476	12.9	Qest.= 297.4cfs
5.0ft-GUTTER FLOW TO PT.# 9.00	11.9	90.5	C	2.5AC	.6 ----	20.2	4.00	.24	.175	311.6	----	-----	----	XFALL= .20000 n=.0300 D= 2.7
											86	.0814	21.9	Qpipe= 311.6cfs
10.00					.1									n=.0240 D= 3.6 57.0"-PIPE
											671	.0462	12.8	Qest.= 321.4cfs
5.0ft-GUTTER FLOW TO PT.# 11.00	6.0	96.4	C	1D/AC	.9 ----	21.2	3.88	.22	.178	321.0	----	-----	----	XFALL= .20000 n=.0300 D= 2.8
11.00		96.4			----	21.2				321.0	----	-----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 96.42 TOTAL AREA(ACRES)= 98.61 PEAK FLOW RATE(CFS)= 321.04
TIME OF CONCENTRATION(MIN.)= 21.17 MEAN VALUES: Fp(IN/HR) = .182; Ap = .975; Fm(IN/HR) = .178

PEAK FLOW RATE TABLE

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
321.04	21.17	.182	.98	.178	3.88	96.42	1.0
310.39	22.86	.181	.98	.177	3.67	98.61	4.0

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA B

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPBH.DAT
TIME/DATE OF STUDY: 9:31 4/10/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
					..						603	.1658	..	INITIAL SUBAREA
2.00	6.6	6.6	C	1D/AC	----	8.7	7.23	.22	.218	41.5	----	----	----	----
											34	.0588	11.9	Qpipe= 41.5cfs
3.00					.0									n=.0240 D= 1.7 30.0"-PIPE
3.00		6.6			----	8.7				41.5	----	----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 6.57 TOTAL AREA(ACRES)= 6.57 PEAK FLOW RATE(CFS)= 41.45
TIME OF CONCENTRATION(MIN.)= 8.74 MEAN VALUES: Fp(IN/HR) = .272; Ap = .800; Fm(IN/HR) = .218

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA C

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPCH.DAT
TIME/DATE OF STUDY: 6:27 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	2.3	2.3	C	2D/AC	..	6.8	8.59	.19	.190	17.7	407	.1843	..	INITIAL SUBAREA
2.00		2.3			....	6.8				17.7	....	.....	....	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 2.34 TOTAL AREA(ACRES)= 2.34 PEAK FLOW RATE(CFS)= 17.69
TIME OF CONCENTRATION(MIN.)= 6.80 MEAN VALUES: Fp(IN/HR) = .272; Ap = .700; Fm(IN/HR) = .190

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA D

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPDH.DAT
TIME/DATE OF STUDY: 6:34 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
					..						579	.2522	..	INITIAL SUBAREA
2.00	2.4	2.4	C	2.5AC	----	8.2	7.55	.24	.245	15.8	----	----	----	----
											620	.0753	8.9	Qest.= 31.3cfs
26.ft-STREET FLOW TO PT.#														D= .4 ,D*V= 3.6
					1.3									FLOODWIDTH= .0
3.00	5.2	7.6	C	1D/AC	----	9.5	6.79	.22	.226	45.1	----	----	----	----
											322	.0258	6.9	Qest.= 50.6cfs
26.ft-STREET FLOW TO PT.#														D= .5 ,D*V= 3.7
					.8									FLOODWIDTH= 6.6
4.00	2.0	9.6	C	1D/AC	----	10.3	6.42	.22	.224	53.5	----	----	----	----
											75	.2267	20.6	Qpipe= 53.5cfs
														n=.0240 D= 1.5
5.00					.1									24.0"-PIPE
5.00		9.6			----	10.4				53.5	----	----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 9.59 TOTAL AREA(ACRES)= 9.59 PEAK FLOW RATE(CFS)= 53.46
TIME OF CONCENTRATION(MIN.)= 10.37 MEAN VALUES: Fp(IN/HR) = .272; Ap = .825; Fm(IN/HR) = .224

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA E

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPEH.DAT
TIME/DATE OF STUDY: 6:41 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	.2	.2	C	Com	..	5.8	9.57	.03	.027	1.9	280	.0304	..	INITIAL SUBAREA
3.00					.2						105	.1429	7.4	Qpipe= 1.9cfs n=.0240 D= .3 18.0"-PIPE
3.00		.2				6.1				1.9				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= .22 TOTAL AREA(ACRES)= .22 PEAK FLOW RATE(CFS)= 1.89
TIME OF CONCENTRATION(MIN.)= 6.06 MEAN VALUES: Fp(IN/HR) = .272; Ap = .100; Fm(IN/HR) = .027

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA F

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPFH.DAT
TIME/DATE OF STUDY: 6:43 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	1.0	1.0	C	Com	..	9.5	6.81	.03	.027	6.1	831	.0235	..	INITIAL SUBAREA
											102	.0882	8.6	Qpipe= 6.1cfs n=.0240 D= .6 18.0"-PIPE
3.00					.2									
3.00		1.0			..	9.7				6.1				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 1.00 TOTAL AREA(ACRES)= 1.00 PEAK FLOW RATE(CFS)= 6.10
TIME OF CONCENTRATION(MIN.)= 9.67 MEAN VALUES: Fp(IN/HR) = .272; Ap = .100; Fm(IN/HR) = .027

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA G

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPGH.DAT
TIME/DATE OF STUDY: 6:49 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
					..						848	.1592	..	INITIAL SUBAREA
2.00	4.1	4.1	C	Nat	----	20.0	4.03	.22	.218	14.1	----	----	----	----
											1298	.1726	18.3	Qest.= 61.5cfs
5.0ft-GUTTER FLOW TO PT.#														XFALL= .20000
					1.4									n=.0300 D= 1.2
3.00	29.6	33.8	C	Nat	----	21.4	3.85	.22	.218	110.2	----	----	----	----
											132	.0833	17.1	Qpipe= 110.2cfs
														n=.0240 D= 2.4
4.00					.1									39.0"-PIPE
											537	.0689	12.8	Qest.= 119.7cfs
5.0ft-GUTTER FLOW TO PT.#														XFALL= .20000
					.7									n=.0300 D= 1.9
5.00	6.0	39.7	C	1D/AC	----	22.3	3.74	.22	.218	126.0	----	----	----	----
											202	.0545	15.1	Qpipe= 126.0cfs
														n=.0240 D= 2.6
6.00					.2									45.0"-PIPE
6.00		39.7			----	22.5				126.0	----	----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 39.71 TOTAL AREA(ACRES)= 39.71 PEAK FLOW RATE(CFS)= 126.04
TIME OF CONCENTRATION(MIN.)= 22.47 MEAN VALUES: Fp(IN/HR) = .225; Ap = .970; Fm(IN/HR) = .218

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA H

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPHH.DAT
TIME/DATE OF STUDY: 6:53 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

[(c) 1983-1994 ADVANCED ENGINEERING SOFTWARE]

CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	.3	.3	C	Com	..	7.6	7.97	.03	.027	2.1	511	.0274	..	INITIAL SUBAREA
											73	.1781	8.3	Qpipe= 2.1cfs
3.00					.1									n=.0240 D= .3 18.0"-PIPE
3.00		.3				7.7				2.1				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= .30 TOTAL AREA(ACRES)= .30 PEAK FLOW RATE(CFS)= 2.14
TIME OF CONCENTRATION(MIN.)= 7.71 MEAN VALUES: Fp(IN/HR) = .272; Ap = .100; Fm(IN/HR) = .027

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA I

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPIH.DAT
TIME/DATE OF STUDY: 6:55 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 1

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
2.00	.2	.2	C	Com	..	5.7	9.76	.03	.027	1.8	248	.0274	..	INITIAL SUBAREA
											87	.2644	8.9	Qpipe= 1.8cfs n=.0240 D= .3 18.0"-PIPE
3.00					.2									
3.00		.2				5.8				1.8				STREAM SUMMARY

EFFECTIVE AREA(ACRES)= .20 TOTAL AREA(ACRES)= .20 PEAK FLOW RATE(CFS)= 1.75
TIME OF CONCENTRATION(MIN.)= 5.83 MEAN VALUES: Fp(IN/HR) = .272; Ap = .100; Fm(IN/HR) = .027

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA J

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPJH.DAT
TIME/DATE OF STUDY: 7:10 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 1 OF 2

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
					..						1050	.1762	..	INITIAL SUBAREA
2.00	4.3	4.3	C	4D/AC	----	9.4	6.83	.16	.163	25.7	----	----	----	----
											499	.1884	16.5	Qpipe= 25.7cfs
3.00					.5									n=.0240 D= 1.0 24.0"-PIPE
											538	.0781	11.7	Qpipe= 25.7cfs
8.00					.8									n=.0240 D= 1.3 24.0"-PIPE
8.00		4.3			----	10.7	6.25			25.7	----	----	----	FOR CONFLUENCE
					..						400	.2500	..	INITIAL SUBAREA
5.00	1.2	1.2	C	1D/AC	----	6.8	8.59	.22	.218	8.7	----	----	----	----
											1088	.0827	9.0	Qest.= 27.2cfs
26.ft-STREET FLOW TO PT.#														D= .4 ,D*V= 3.5 FLOODWIDTH= -.9
6.00	6.0	7.2	C	1D/AC	2.4 ----	9.2	6.94	.22	.218	43.6	----	----	----	----
											212	.0142	5.0	Qest.= 63.6cfs
64.ft-STREET FLOW TO PT.#														D= .9 ,D*V= 4.3 FLOODWIDTH=41.8
7.00	7.0	14.2	C	1D/AC	.7 ----	9.9	6.59	.22	.218	81.3	----	----	----	----
											210	.0190	9.1	Qpipe= 81.3cfs
8.00					.4									n=.0240 D= 2.8 45.0"-PIPE

CONFLUENCE ANALYSIS FOR POINT# 8.00

PEAK FLOW RATE(CFS) = 106.7
TIME OF CONCENTRATION(MIN.) = 10.3
MEAN VALUES: Fp(IN/HR) = .272; Ap = .755; Fm(IN/HR) = .205
EFFECTIVE AREA(ACRES) = 18.28 TOTAL AREA(ACRES) = 18.44

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
104.78	10.69	.272	.75	.205	6.25	18.44	1.0
106.68	10.30	.272	.75	.205	6.42	18.28	4.0

LARGEST CONFLUENCE Q= 106.7

TRACT No. 16136 MOON CAMP (JN 9373)
PROPOSED HYDROLOGY
AREA J

[SAN BERNARDINO COUNTY]

FILE NAME:9373HPJH.DAT
TIME/DATE OF STUDY: 7:10 4/11/2002
100.0-YEAR STORM RATIONAL METHOD STUDY (AMC III LOSSES)

CALCULATED BY: R.CLARK
CHECKED BY: R.CLARK
PAGE NUMBER 2 OF 2

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CONCENTRATION POINT NUMBER	AREA (ACRES) SUBAREA	AREA (ACRES) SUM	SOIL TYPE	DEV. TYPE	Tt MIN.	Tc MIN.	I in/h	Fm	Fm (Avg)	Q SUM	PATH (ft)	SLOPE ft/ft	V FPS.	HYDRAULICS AND NOTES
											142	.0352	12.3	Qpipe= 106.7cfs
9.00					.2									n=.0240 D= 2.8 45.0"-PIPE
9.00		18.3			----	10.5				106.7	----	-----	----	STREAM SUMMARY

EFFECTIVE AREA(ACRES)= 18.28 TOTAL AREA(ACRES)= 18.44 PEAK FLOW RATE(CFS)= 106.68
TIME OF CONCENTRATION(MIN.)= 10.50 MEAN VALUES: Fp(IN/HR) = .272; Ap = .755; Fm(IN/HR) = .205

PEAK FLOW RATE TABLE

Q(cfs)	Tc(min)	Fp(avg)	Ap(avg)	Fm(avg)	I(in/hr)	Ae(acres)	NODE
106.68	10.50	.272	.75	.205	6.34	18.28	4.0
104.78	10.89	.272	.75	.205	6.18	18.44	1.0

15.10 Jurisdictional Delineation

DELINEATION OF JURISDICTIONAL WATERS
Moon Camp
Tentative Tract #16136
County of San Bernardino, California

Prepared For:

County of San Bernardino
385 N. Arrowhead Avenue, 1st Floor
San Bernardino, California 92415
Contact: Mr. Mike Williams
909/387-4168

Prepared By:

RBF Consulting
14725 Alton Parkway
Irvine, California 92618
Contact: Mr. Trevor Smith
949/855-5718

March 2002

JN 10-101901

Delineation of Jurisdictional Waters for the Moon Camp Project (Tentative Tract #16136) County of San Bernardino, California

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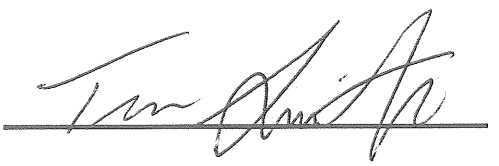
The undersigned certify that this report is a complete and accurate account of the findings and conclusions of a jurisdictional "waters of the U.S." determination for the above-referenced project.

RBF Consulting

Richard Beck
Environmental Analyst



Trevor Smith
Project Manager

March 2002

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1.0 INTRODUCTION AND PURPOSE

This report was prepared for the County of San Bernardino in order to delineate U.S. Army Corps of Engineers' and California Department of Fish and Game's (CDFG) jurisdictional authority for unnamed drainages located within the project site known as Moon Camp-Tentative Tract #16136, a residential subdivision. The proposed project is located along the north shore of Big Bear Lake, in the community of Fawnskin, County of San Bernardino, State of California (refer to Exhibit 1, *Regional Vicinity Map,* and Exhibit 2, *Site Vicinity Map*).

1.1 Project Description

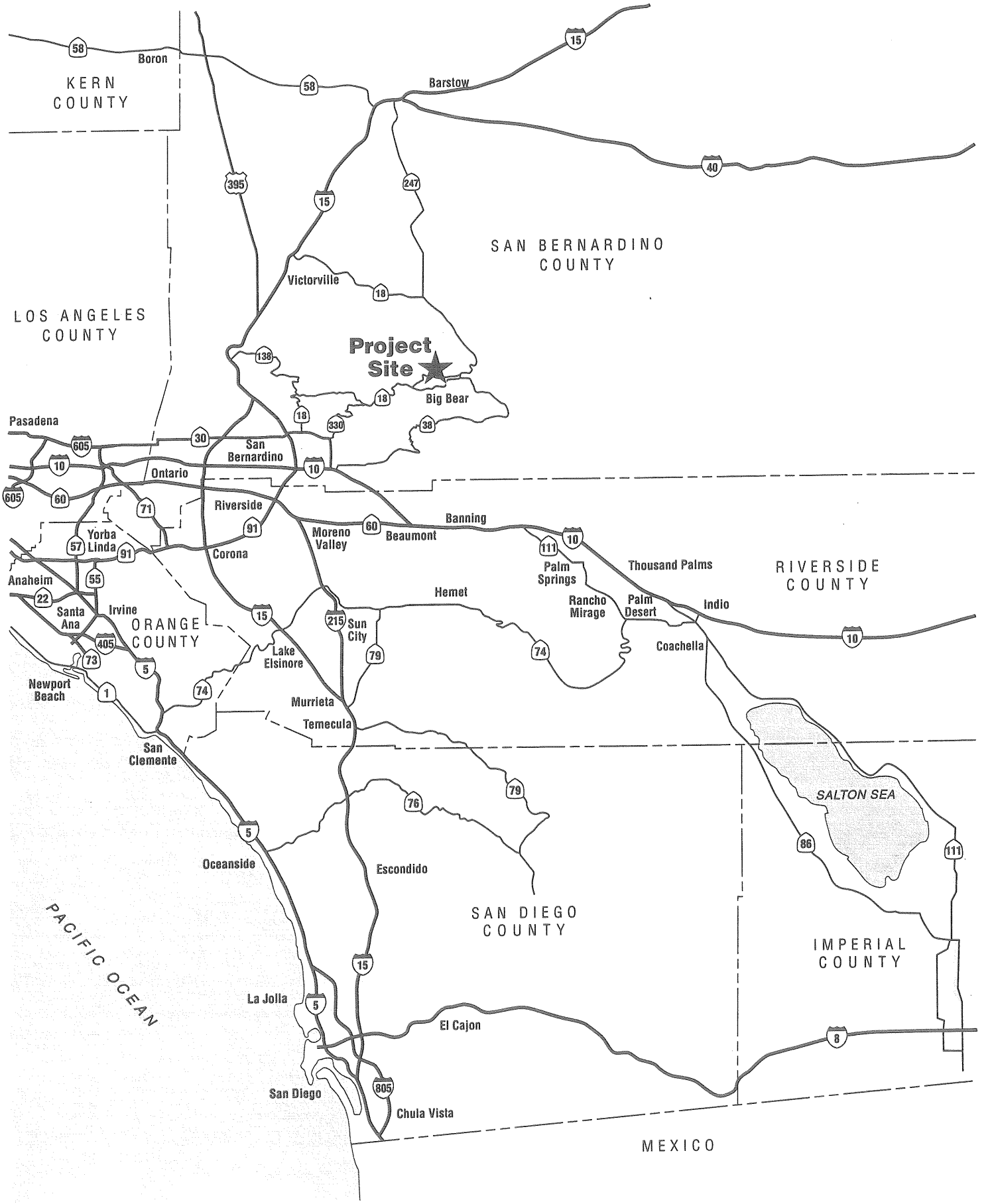
The proposed project consists of a 95-lot residential subdivision with lots ranging in size from 0.17-acres to 2.11-acres (refer to Exhibit 3, *Project Site Plan*). The project site includes 62.43-acres and is in a relatively undeveloped eastern portion of Fawnskin.

2.0 SUMMARY OF REGULATIONS

There are three key agencies that regulate activities within inland streams, wetlands and riparian areas in California. The U.S. Army Corps of Engineers (Corps) Regulatory Program regulates activities pursuant to Section 404 of the Federal Clean Water Act, and Section 10 of the Rivers and Harbors Act. The California Department of Fish and Game (CDFG) regulates activities under the Fish and Game Code Section 1600-1607, and the Regional Water Quality Control Board (RWQCB) under Section 401 of the Federal Clean Water Act and the California Porter-Cologne Act.

2.1 Army Corps of Engineers

The Corps of Engineers has regulatory authority over the discharge of dredged or fill material into the waters of the United States under Section 404 of the Clean Water Act (CWA). The term "waters of the United States" includes (1) all waters that have, are, or may be used in interstate or foreign commerce (including sightseeing or hunting), including all waters subject to the ebb and flow of the tide; (2) wetlands; (3) all waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds; the use, degradation or destruction of which could affect interstate or foreign commerce; (4) all impoundments of water mentioned above; (5) all tributaries of waters mentioned above; (6) the territorial seas; and (7) all wetlands adjacent to the waters mentioned above. Under this definition, and in the absence of wetlands, the limits of the Corps' jurisdiction in non-tidal waters extend to the ordinary high water mark (OHWM), which is defined as "...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."



MOON CAMP-TENTATIVE TRACT #16136
JURISDICTIONAL DELINEATION

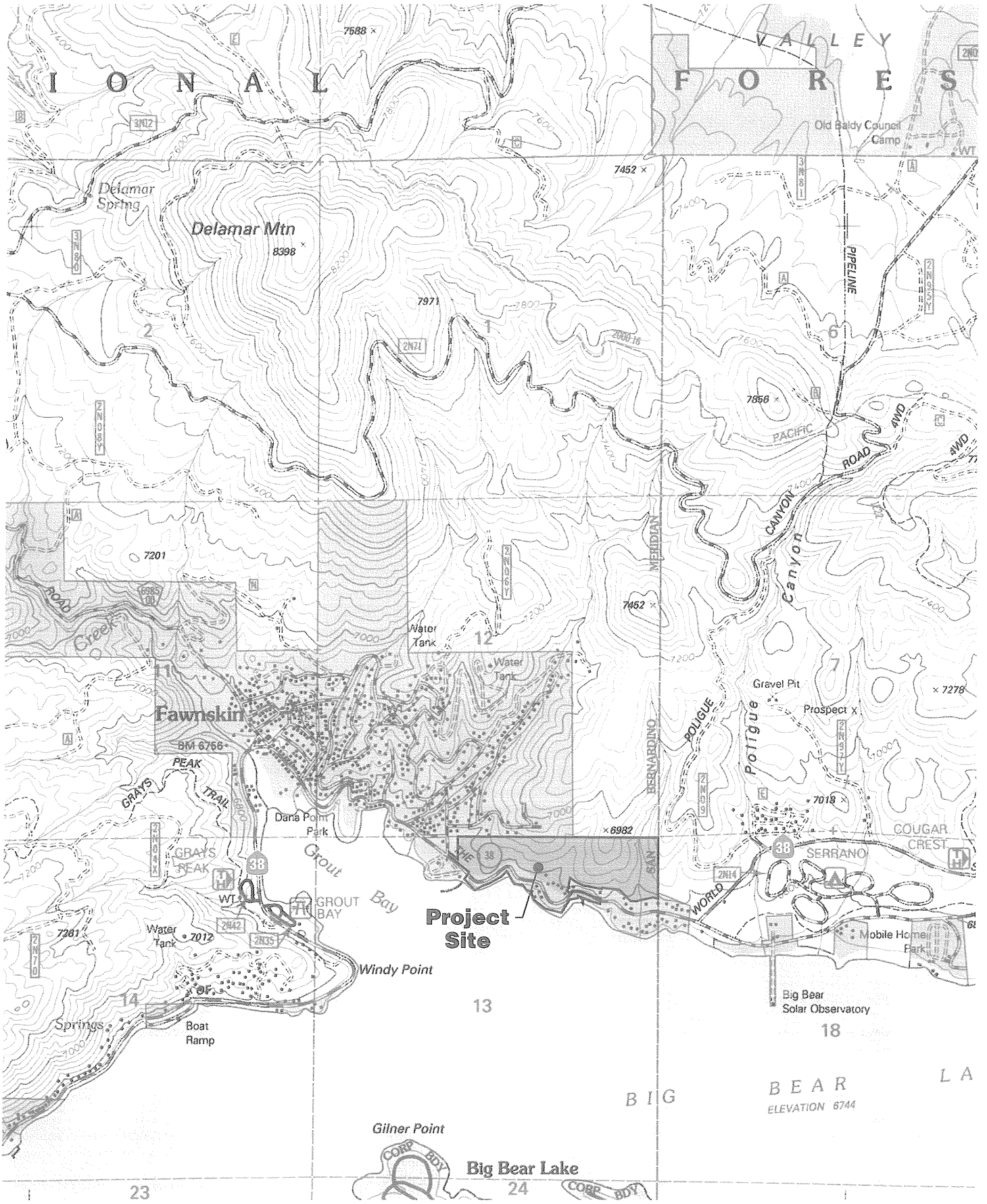
Regional Vicinity

RBF CONSULTING

not to scale

3/13/02 JN 10-101901-9314

Exhibit 1



USGS Topo, Fawnskin, Calif., 1996

RBF CONSULTING

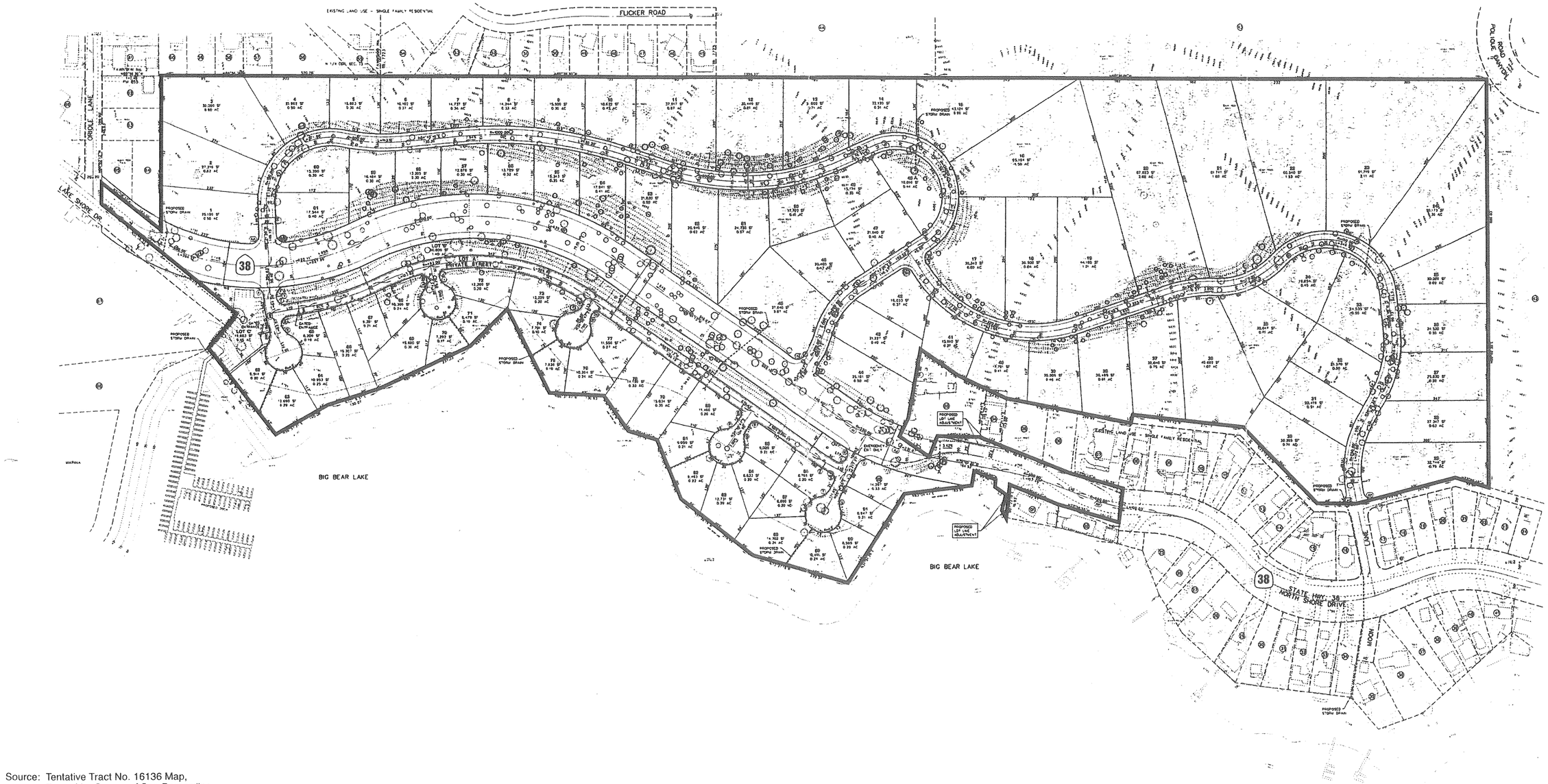
0 2000'

3/13/02 JN 10-101901-9314

MOON CAMP-TENTATIVE TRACT #16136
JURISDICTIONAL DELINEATION

Site Vicinity

Exhibit 2



Source: Tentative Tract No. 16136 Map,
Fawnskin, County of San Bernardino,
Hicks & Harwick, Inc., 5/21/01.

RBF CONSULTING

0 250'

3/13/02 JN 10-101901-9314

MOON CAMP-TENTATIVE TRACT #16136
JURISDICTIONAL DELINEATION

Project Site Plan

Exhibit 3

Wetlands, a subset of jurisdictional waters, are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions". The Corps has developed a methodology for determining the boundaries of jurisdictional wetlands that is published in the document known as the *1987 Manual*. The methodology set forth in the manual is based on the following three indicators that are normally present in wetlands: (1) hydrology providing permanent or periodic inundation by groundwater or surface water, (2) hydric soils, and (3) hydrophytic vegetation. In order to be considered a wetland, an area must exhibit at least minimal hydric characteristics within these three parameters.

2.2 Regional Water Quality Control Board

The Regional Water Quality Control Board (RWQCB) is the primary agency responsible for protecting water quality in California. The RWQCB regulates discharges to surface waters under the federal Clean Water Act and the California Porter-Cologne Water Quality Control Act. The RWQCB's jurisdiction extends to all waters of the State and to all waters of the United States, including wetlands.

The Clean Water Act Section 401 gives the RWQCB the authority to regulate through 401 Certification any proposed federally-permitted activity which may affect water quality. Among such activities are discharges of dredged or fill material permitted by the Corps under Clean Water Act Section 404. Certification must be based on a finding that the proposed discharge will comply with water quality standards.

2.3 California Department of Fish and Game

The State of California regulates activities in rivers, streams, and lakes pursuant to Sections 1600-1607 of the California Fish and Game Code. These sections discuss the process by which an individual, government agency, or public utility must notify the Department of Fish and Game prior to any activity that would "substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake..." Following such notification, the Department must inform the individual, agency, or utility of the existence of any fish and wildlife resource that may be substantially adversely affected by the activity. The Department must also include a proposal for measures to protect fish and wildlife resources. This proposal is called a "Streambed Alteration Agreement" (1601 Agreement for public agencies and utilities, and a 1603 Agreement for private party activities).

Jurisdictional limits of the CDFG are not as clearly defined by regulation as those of the Corps. While they closely resemble the limits described by Corps regulations, they exclude isolated wetlands (those not associated with a stream, river, or lake, such as isolated vernal pools) and include riparian habitat supported by a river, stream, or lake regardless of the presence or absence of hydric soils and saturated soil conditions. Generally, CDFG takes jurisdiction to the bank of the stream or to the outer limit of the adjacent riparian vegetation, whichever is greater.

2.4 Activities Requiring Permits

Any development proposal that involves impacting the drainages, streams, or wetlands on the site through filling, stockpiling, conversion to a storm drain, channelization, bank stabilization, road or utility line crossings, or any other modification would require permits from the Corps, the RWQCB, and the CDFG before any development could commence on the project site. Both permanent and temporary impacts are regulated and would trigger the need for permits. Processing of the 401 and 1603 can occur concurrently with the Corps permit process and can utilize the same information and analysis. The Corps will not issue its authorization until the RWQCB completes the Section 401 Water Quality Certification. Applications to both the RWQCB and the CDFG requires submittal of a valid California Environmental Quality Act (CEQA) document along with the application.

3.0 METHODOLOGY

Prior to visiting the site, RBF conducted a review of USGS topographic maps (Quadrangle *Fawnskin, California*, dated 1996) and aerial photographs to identify areas that *may* fall under any agency's jurisdiction. Corps jurisdictional wetlands are delineated using the methods outlined in the Corps of Engineers *Wetland Delineation Manual* (1987) based on hydrologic and edaphic features of the site, and on the vegetation composition of the site. Non-wetland waters of the U.S. are delineated based on the limits of the OHWM as determined by erosion, the deposition of vegetation or debris, and changes in the vegetation. CDFG jurisdiction is defined to the bank of the stream/channels or to the limit of the adjacent riparian vegetation.

Analysis presented in this document consists of field surveys and verification of current conditions conducted on March 15, 2002. While in the field, jurisdictional areas were recorded onto a base map at an approximate scale of 1"=300' using visible landmarks. Conditions during field work were generally good and it is assumed that conditions encountered at the time of field investigations represented a "normal" rainfall year.

3.1 Vegetation

Cover of vegetation is estimated and are ranked according to their dominance. Species that contribute to a cumulative total of 50% of the total dominant coverage, plus any species that comprise at least 20% (also known as the "50/20 rule") of the total dominant coverage are recorded a wetland data sheet. Wetland indicator status is assigned to each species using *The List of Plant Species that Occur in Wetlands* (FWS, 1996). If greater than 50% of the dominant species from all strata were Obligate, Facultative-wetland, or Facultative species, the criteria for wetland vegetation was considered to be met. Plant indicator status categories are described below:

- **Obligate Wetland (OBL):** Plants that occur almost always (estimated >99 percent) in wetlands under natural conditions, but which may also occur rarely (estimated <1 percent) in non-wetlands.

- **Facultative Wetland (FACW):** Plants that occur usually (estimated >67 to 99 percent) in wetlands, but also occur (estimated 1 to 33 percent) in non-wetlands.

- **Facultative (FAC):** Plants with similar likelihood (estimated 33 to 67 percent) of occurring in both wetlands and non-wetlands.

- **Facultative Upland (FACU):** Plants that occur sometimes (estimated 1 to <33 percent) in wetlands, but occur more often (estimated >67 to 99 percent) in non-wetlands.

- **Obligate Upland (UPL):** Plants that occur rarely (estimated 1 percent) in wetlands, but occur almost always (estimated >99 percent) in non-wetlands under natural conditions.

3.2 Soils

The presence of hydric soils are initially investigated by comparing the mapped soil series for the site to the county list of hydric soils. Soil characteristics are verified by digging soil pits along each transect to a depth of at least 18 inches. At each soil pit, the soil texture and color are recorded by comparison with standard plates within a *Munsell Soil Chart* (1994). Any indicators of hydric soils, such as redoximorphic features, buried organic matter, organic streaking, reduced soil conditions, gleyed or low-chroma soils, or sulfuric odor are also recorded. It should also be noted that the limits of wetland hydrology indicators are used as a guide for locating soil pits. If any hydric soil features are located, progressive pits are dug moving laterally away from the active channel until hydric features are no longer present within the top 18 inches of the soil profile.

3.3 Hydrology

If wetland vegetation criteria is met, the presence of wetland hydrology is evaluated at each transect by recording the extent of observed surface flows, depth of inundation, depth to saturated soils, and depth to free water in the soil test pits. In addition, indicators of wetland or riverine hydrology are recorded including Ordinary High Water Marks (OHWM), drift lines, rack ,debris, and sediment deposits. The lateral extent of the hydrology indicators are used as a guide for locating soil pits for evaluation of hydric soils and jurisdictional areas. In portions of the stream where the flow is divided by multiple channels with intermediate sand bars, the entire area between the channels is considered within the OHWM and the wetland hydrology indicator is considered met for the entire area.

4.0 SITE CONDITIONS

The 62.43-acre site (designated RL-40, Rural Living, by the County of San Bernardino) gently slopes from south to north. Elevations range from 6,747 at the lakefront, to a high of 6,960 at the northeast boundary. Total relief is therefore 483 feet and slopes range from five percent to 40 percent. The site is vegetated in Jeffrey Pine forest and pebble plain habitat occurs in scattered patches in the western portion of the property. Dirt roads and

trails traverse the property; access to the project site is provided via Highway 38 (refer to Exhibit 4, *Project Site Aerial Photo* and Exhibit 5, *Site Photographs*).

4.1 Vegetation

Vegetation within the drainages of the project site consisted of upland habitat, dominated by jeffery pines.

4.2 Soils

Soils within the drainages were documented to be silty-sand (large grain). Soil samples taken on-site were generally dry and lacked characteristics of hydric soils (i.e., odor, streaking, mottling).

4.3 Hydrology

No flow within the on-site drainages was observed during the March 15, 2002 field visit. However, evidence of an OHWM was observed within the drainages, primarily indicated by sediment deposits.

5.0 FINDINGS

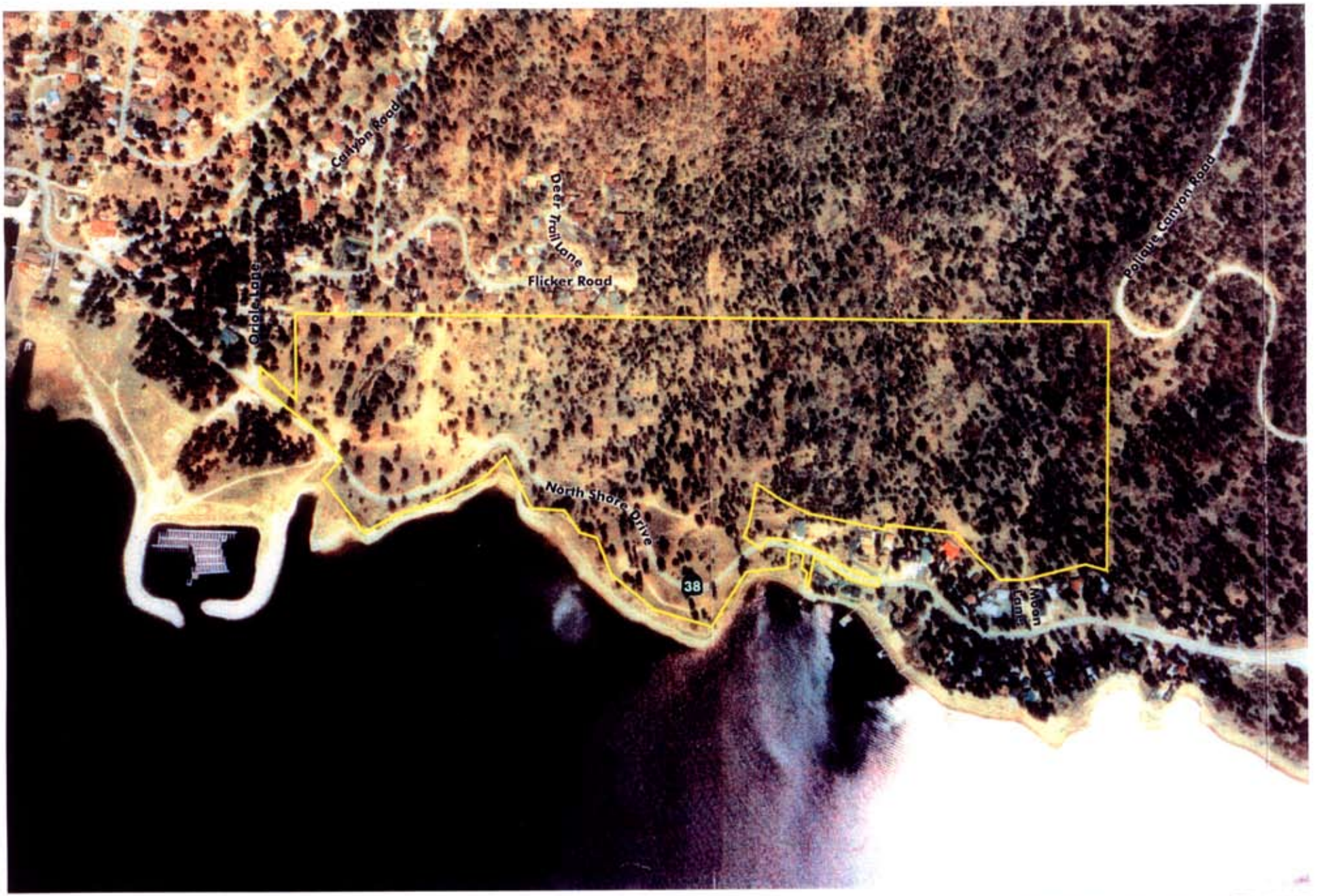
5.1 Waters of the U.S. (Wetland) Determination

The Corps and the EPA jointly define wetlands as: *Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas* (33 CFR §328.3(b)). Wetlands have the following general diagnostic environmental characteristics:

Vegetation: The prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrologic and soil conditions. Hydrophitic species, due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, reproduce, and/or persist in anaerobic soil conditions.

Soil: Soils are present and have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions.

Hydrology: The area is inundated either permanently or periodically at mean water depths $\leq$6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation.



RBF CONSULTING

0 500'

3/13/02 JN 10-101901-9314

MOON CAMP-TENTATIVE TRACT #16136
JURISDICTIONAL DELINEATION

Project Site Aerial Photo

Exhibit 4

View looking at sediment deposits within the main eastern drainage.

Typical view of on-site drainage and surrounding vegetation.

As previously noted, in order to be considered a wetland, an area must exhibit **all three** of the wetland parameters identified above per the evaluation criteria in the Wetland Delineation Manual. Based on the results of the field investigations, it was determined that not all three parameters were present within the drainages (hydric soils nor riparian vegetation were present). As a result, RBF identified no Corps wetlands on the proposed project site.

5.2 Waters of the U.S. (Non-Wetland) Determination

The unnamed drainages within the proposed project site exhibited evidence of flow (i.e., sediment/silt deposition) sufficient to document the Ordinary High Water Mark (i.e., channel bed and bank lines), thus meeting the criteria for jurisdictional waters. Refer to Exhibit 5, *Site Photographs*, for representative photos of the jurisdictional drainages. Also, refer to Exhibit 6, *Jurisdictional Map*, for an illustration of jurisdictional boundaries.

Based on the results of the field observations and data collection, RBF identified 0.15-acre of Corps jurisdictional "waters of the U.S." within the 62.43-acre proposed project site. The drainages are ephemeral. Utilizing the most current development plans, it was also determined that roadway improvements would impact 0.04-acre of Corps jurisdiction.

5.3 California Department of Fish and Game (1603) Jurisdiction

Based on the results of the field observations and data collection, RBF identified 0.15 -acre of CDFG jurisdictional waters. Utilizing the most current development plans, it was also determined that roadway improvements would impact 0.04-acre of CDFG jurisdiction (refer to Exhibit 6, *Jurisdictional Map)*.

6.0 OVERVIEW OF REGULATORY APPROVAL PROCESS

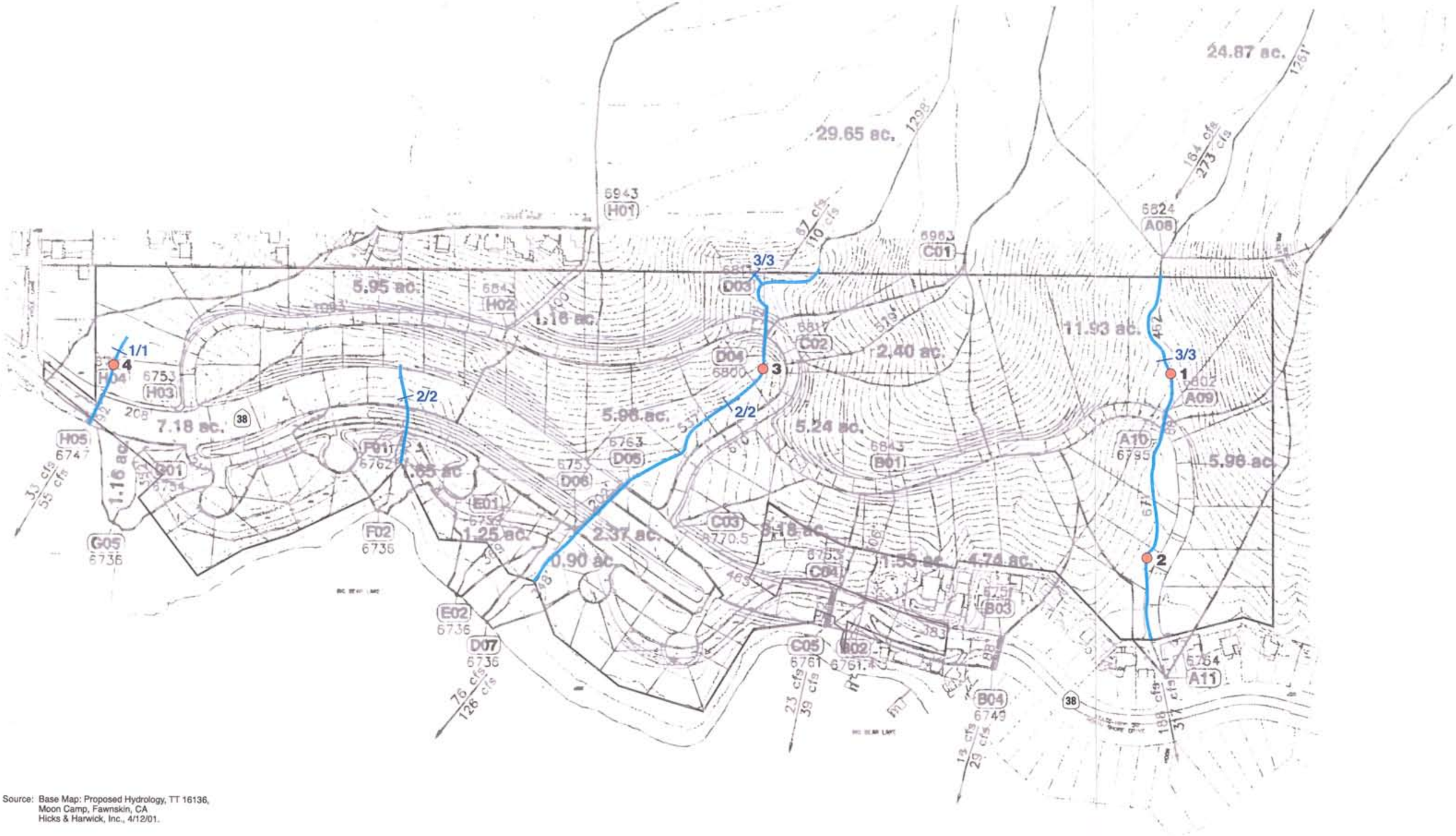
The following is a summary of the various permits, agreements, and certifications required before construction activities take place within the above mentioned jurisdictional areas.

6.1 Army Corps of Engineers

The Corps regulates discharges of dredged fill materials into "waters of the United States" under Section 404 of the Clean Water Act (CWA). Since improvements associated with the proposed project will result in the discharge of material within the jurisdiction of the Corps, a 404 permit will be required.

6.2 California Department of Fish and Game

As noted above, the drainage within the proposed project area meets the CDFG's definition as streambed and thus would be regulated by them. An agreement from the Department must be obtained. The CDFG agreement will require a $1,390.50 fee and approximately 45 days processing time. CEQA Compliance is necessary in order for the Agreement to be issued.



Source: Base Map: Proposed Hydrology, TT 16136,
Moon Camp, Fawnskin, CA
Hicks & Harwick, Inc., 4/12/01.

RBF CONSULTING

0 250'

3/25/02 JN 10-101901-9314

ACOE/CDFG Jurisdictional Boundaries

Soil Test Pit

MOON CAMP-TENTATIVE TRACT #16136
JURISDICTIONAL DELINEATION

Jurisdictional Map

Exhibit 6

6.3 Regional Water Quality Control Board

The RWQCB requires that a CEQA compliance certification be obtained before starting this process. Processing time should not exceed 60 days following submission of a complete application (determination of what constitutes a complete application is made by the Regional Water Quality Control Board). Additionally, the RWQCB requires that water quality concerns related to urban storm water runoff be addressed. Any 401 Certification application submitted to the RWQCB should incorporate the use of Best Management Practices (BMPs) for the treatment of pollutants carried by storm water runoff in order to be considered a complete application. For the 404 permit to be approved, a 401 water certification will be required. A $1,000 fee is required as part of the application submittal.

7.0 REFERENCES

Army Corps of Engineers (ACOE) Wetland Delineation Manual, 1987.

Munsell Soil Color Charts, 1994.

National List of Vascular Plant Species that Occur in Wetlands, U.S. Fish and Wildlife Service, 1996.

Site Visit, conducted on March 15, 2002.

USGS Topographic Map, Fawnskin, California, Quadrangle, 1996.

APPENDICES

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: MOON CAMP
Applicant/Owner:
Investigator: R. BECK / T. SMITH

Date: 3/15/02
County: S.B.
State: CA

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes No
Is the area a potential Problem Area? Yes (NO)
(If needed, explain on reverse.)

Community ID: —
Transect ID: —
Plot ID: 1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. JEFFERY PINE	TREE	—
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks:
Upland habitat / dry

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:
Depth of Surface Water: — (in.)
Depth to Free Water in Pit: — (in.)
Depth to Saturated Soil: — (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
X Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:
No flow present. Sediment, rock observed, small banks. Pine needle ground cover.

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
8"	A	—	—	—	Silty-Sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No indicators present. Sandy, with large grain size.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:
Non-Wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Moon Camp
Applicant/Owner:
Investigator: R. Beck / T. Smith

Date: 3/15/02
County: SB
State: CA

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on reverse.)

Community ID: —
Transect ID: —
Plot ID: 3

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Jeffery Pine	Tree	—
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks: open areas, upland habitat / dry.

HYDROLOGY

__ Recorded Data (Describe in Remarks):
__ Stream, Lake, or Tide Gauge
__ Aerial Photographs
__ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)
Depth to Free Water in Pit: — (in.)
Depth to Saturated Soil: — (in.)

Wetland Hydrology Indicators:
Primary Indicators:
__ Inundated
__ Saturated in Upper 12 Inches
__ Water Marks
__ Drift Lines
X Sediment Deposits
__ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
__ Oxidized Root Channels in Upper 12 Inches
__ Water-Stained Leaves
__ Local Soil Survey Data
__ FAC-Neutral Test
__ Other (Explain in Remarks)

Remarks: No flow present. Sediment, larger rocks observed, rocks on small banks. "Y", in northern drainage.

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
8"	A	–	–	–	S.Fy - SAND/SAND

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No indicators present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:
Non-Wetland.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Moon Camp
Applicant/Owner:
Investigator: R. Beck / T. Smith

Date: 3/15/02
County: S.B.
State: CA

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on reverse.)

Community ID: —
Transect ID: —
Plot ID: 2

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Jeffery Pine	Tree	—
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks:
upland habitat / dry

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)
Depth to Free Water in Pit: — (in.)
Depth to Saturated Soil: — (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
X Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:
No flow present. Sediment rock observed.
Small banks, Pine Needle ground cover.

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
8"	A	—	—	—	Silty - Sand

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No indicators present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks:
Non-Wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Moon Camp
Applicant/Owner:
Investigator: R. Beck / T. Smith

Date: 3/15/02
County: SB
State: CA

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on reverse.)

Community ID: —
Transect ID: —
Plot ID: 4

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Jeffery Pine	Tree	—
2. Upland Shrubs	Shrub	—
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks: upland habitat

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: — (in.)
Depth to Free Water in Pit: — (in.)
Depth to Saturated Soil: — (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
X Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Appeared to bed fed by outfall to the north.

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
8"	A	—	—	—	Silty-Sand.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:
No indicators present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? Yes (No)

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks:
Non-Wetland.

Approved by HQUSACE 3/92

15.11 Geohydrologic Evaluation

Focused Geohydrologic Evaluation of the Maximum Perennial Yield of the North Shore and Grout Creek Hydrologic Subunit Tributary Subareas

Prepared for: City of Big Bear Lake Department of Water and Power

December 2, 2003

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FOCUSED GEOHYDROLOGIC EVALUATION OF MAXIMUM PERENNIAL YIELD FOR THE NORTH SHORE AND GROUT CREEK HYDROLOGIC SUBUNITS

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APPENDIX

Ltr.	Description	
A	Well Information Summary	North Shore and Grout Creek Hydrologic Subunits

FOCUSED GEOHYDROLOGIC EVALUATION OF MAXIMUM PERENNIAL YIELD FOR THE NORTH SHORE AND GROUT CREEK HYDROLOGIC SUBUNITS

1.0 EXECUTIVE SUMMARY

The Big Bear Lake Watershed, located in the San Bernardino Mountains of western San Bernardino County, California has previously been divided into seven hydrologic subunits based on surface water drainage divides. Two of the hydrologic subunits, the North Shore and Grout Creek Subunits, extend across most of the northern portion of Big Bear Lake. Although these subunits can be categorized as independent surface drainage catchments, their large size and/or elongated east-west extent warrants further subdivision to distinguish available ground water resources in the eastern portion from available ground water resources in the western portion. This report presents a focused geohydrologic evaluation of the maximum perennial yield of the North Shore and Grout Creek subunits that includes dividing each subunit into smaller tributary subareas.

Maximum perennial yield was evaluated in the context of the total average annual ground water recharge within the North Shore and Grout Creek subunits. Ground water recharge is the total amount of water that reaches the aquifer (i.e. ground water reservoir) through natural processes, such as deep percolation of precipitation falling on the land surface and infiltration beneath flowing stream channels. In the development of ground water resources for municipal supply, however, not all of the natural recharge that any given aquifer receives on an average annual basis can be developed.

Maximum perennial yield is distinguished from average annual ground water recharge through the following definition:

> *The maximum quantity of ground water perennially available if all possible methods and sources are developed for recharging the basin. This quantity depends on the amount of water economically, legally, and politically available to the organization or agency managing the basin (Todd, 1980).*

By definition, the maximum perennial yield is some portion (i.e. subset) of the total amount of ground water recharge that the aquifers receive from precipitation on an average annual basis. Not all of the water that reaches the aquifer can be developed for beneficial use because either it is not economically feasible, or there is no legal right to the water, or political constraints prevent or inhibit development.

Average annual ground water recharge estimates were assigned to smaller tributary subareas, which were determined from surface drainage divides within the larger hydrologic subunits. The North Shore Subunit was subdivided into six tributary subareas (A through F) and the Grout Creek Subunit was subdivided into four tributary subareas (A through D). The boundaries of the tributary subareas represent surface water drainage divides, which, for most of the tributary subareas also represent ground water flow divides. Exceptions include the margins of Big Bear Lake and in the southeast portion of the North Shore Subunit, where the ground water within one subarea/subunit can be in hydraulic communication with adjacent subareas/subunits.

Average annual ground water recharge was estimated for each tributary subarea using a watershed hydrologic model and by estimating ground water underflow (conducted for the alluvial portion of the Grout Creek Subunit only). When possible, measured data was used as input for the analysis of ground water recharge. Measured data included:

- Long-term precipitation records from weather stations within the Big Bear Lake watershed,
- Evapotranspiration data from evaporation pans and weather stations within the watershed,
- Ground water levels, and
- Ground water production.

However, most of the input parameters that are required for a detailed evaluation of the average annual ground water recharge had to be estimated or assumed from data collected outside the Grout Creek and North Shore subunits or outside the Big Bear Lake Watershed due to lack of measured data in the area. Although the assumed values are published and are from reliable sources (i.e. the U.S. Environmental Protection Agency, United States Geological Survey, etc.), they are not specific to the area of interest. Numerous additional monitoring features can be developed to collect the data necessary to refine the ground water recharge estimates. However, priority should be given to the construction of monitoring wells and the development of a reliable ground water level baseline for the tributary subareas.

The results of the ground water recharge analysis for the North Shore Subunit are as follows:

Summary of Ground Water Recharge Results
North Shore Tributary Subareas

Tributary Subarea	Area [acres]	Annual Precipitation [inches]	Average Annual Ground Water Recharge - Low Estimate [acre-ft/yr]	Average Annual Ground Water Recharge - High Estimate [acre-ft/yr]	Average of Ground Water Recharge Estimate Range [acre-ft/yr]
A	247	27.87	14	44	29
B	720	25.45	36	110	73
C	828	23.01	37	107	72
D	558	21.45	22	63	43
E	392	20.01	15	39	27
F	814	18.27	23	66	44

Based on the analyses presented in this report, the following have been concluded regarding the maximum perennial yield of the North Shore Hydrologic Subunit:

- The North Shore Hydrologic Subunit can be conveniently subdivided into six tributary subareas (A through F) based on surface water drainage divides;

- The revised range of average annual ground water recharge for the North Shore Hydrologic Subunit as a whole is approximately 150 to 430 acre-ft/yr with a midpoint of approximately 290 acre-ft/yr.

- The midpoint of the estimated range of average annual ground water recharge (290 acre-ft/yr) is considered a good estimate of maximum perennial yield for the North Shore Hydrologic Subunit, given the available data. The midpoint of the range is approximately 4.5 percent of precipitation for the subunit which is within the range of accepted recharge estimates for other ground water basins in southern California (3 to 7 percent; Metropolitan Water District of Southern California (MWD), 1999; Daniel B. Stevens, 1996).

- The revised perennial yield of **290 acre-ft/yr** is slightly higher than the previous perennial yield value of 260 acre-ft/yr from the GEOSCIENCE, 2001 report, primarily as a result of the use of an updated EPA input parameter list for the watershed model and the consideration of the bedrock aquifer as a viable source of ground water supply;

- The maximum perennial yield for individual tributary subareas within the North Shore Subunit range from 27 acre-ft/yr (Subarea E) to 73 acre-ft/yr (Subarea B); and

- Additional ground water monitoring and geohydrologic data collection are required in each individual subarea to manage the ground water resources in the area as it is developed in the future.

The results of the ground water recharge analysis for the Grout Creek Subunit are as follows:

Summary of Ground Water Recharge Results
Grout Creek Tributary Subareas

Tributary Subarea	Area (acres)	Annual Precipitation (inches)	Average Annual Ground Water Recharge - Low Estimate (acre-ft/yr)	Average Annual Ground Water Recharge - High Estimate (acre-ft/yr)	Average of Ground Water Recharge Estimate Range (acre-ft/yr)
A	1,074	33.44	74	249	161
B	850	29.01	50	160	105
C	1,668	29.93	104	331	217
D	592	26.74	32	99	66

For the Grout Creek Hydrologic Subunit, the following is concluded:

- The Grout Creek Hydrologic Subunit can be conveniently subdivided into four tributary subareas (A through D) based on surface water drainage divides;

- The revised range of average annual recharge for the Grout Creek Hydrologic Subunit as a whole (Tributary Subareas A through D) is approximately 260 to 840 acre-ft/yr with a midpoint of approximately 550 acre-ft/yr. However, ground water resources in Subareas A and B of the Grout Creek Subunit are not currently practical to develop because they are remote and are located on land under the jurisdiction of the USFS;

- Due to the cost and political limitations associated with ground water development in Subareas A and B, it is currently recommended to use the sum of the midpoint recharge estimates for tributary Subareas C and D as the maximum perennial yield for the Grout Creek Subunit. This results in a maximum perennial yield for the Grout Creek Subunit of **283 acre-ft/yr**;

- The revised perennial yield is higher than the previous perennial yield value of

200 acre-ft/yr from the GEOSCIENCE, 2001 report, primarily as a result of the use of an updated EPA input parameter list for the watershed model and the consideration of the bedrock aquifer as a viable source of ground water supply;

- The maximum perennial yield for individual tributary subareas within the Grout Creek Subunit range from 66 acre-ft/yr (Subarea D) to 217 acre-ft/yr (Subarea C).

Given the possible range of recharge for the North Shore and Grout Creek Hydrologic Subunits, and correspondingly the range of recharge for the individual tributary subareas within each subunit, it is recommended that development planning for tributary subareas be initially based on the maximum perennial yield estimates described above. However, as ground water production is initiated in each tributary subarea, it will be very important to monitor ground water levels in dedicated non-pumping monitoring wells located in each tributary subarea from which ground water is extracted.

The ground water recharge analysis is based on long-term precipitation records. However, short-term periods (5 to 10 years) of relatively low precipitation have been observed throughout the period of record. These short-term periods of low precipitation are anticipated to have a significant impact on the ground water levels in the North Shore and Grout Creek Hydrologic Subunits because the storage capacity of the ground water reservoir is relatively small. For this reason, future ground water production, and development, in each tributary subunit should rely more on established ground water level thresholds than the perennial yield estimates.

2.0 INTRODUCTION

2.1 Background

The Big Bear Lake Watershed, located in the San Bernardino Mountains of western San Bernardino County, California (see Figure 1), has previously been divided into seven hydrologic subunits based on surface water drainage divides (Glenn A. Brown & Associates, 1974; GEOSCIENCE, 2001). These hydrologic subunits include: Gray's Landing, Mill Creek, Village, Rathbone, Division, North Shore and Grout Creek. The North Shore Hydrologic Subunit extends across most of the northern portion of Big Bear Lake (see Figure 2). Although the subunit can be categorized as one surface drainage catchment, its elongated east-west extent warrants further subdivision to distinguish available ground water resources in the eastern portion from available ground water resources in the western portion. Likewise, the large size of the Grout Creek Subunit, also located on the northern side of Big Bear Lake, also warranted further subdivision.

As a follow-up study to the most recent Maximum Perennial Yield analysis for the Big Bear Lake area (GEOSCIENCE, 2001), GEOSCIENCE conducted a focused evaluation of the maximum perennial yield of the North Shore and Grout Creek Hydrologic Subunits. The evaluation involved dividing the larger subunits into multiple tributary subareas and assigning perennial yield values to each of the subareas.

2.2 Purpose and Scope

The purpose of this report is to summarize the methodology, analysis, and findings of a focused evaluation of maximum perennial yield for the North Shore and Grout Creek Hydrologic Subunits of the Big Bear Lake Watershed. The scope of this evaluation included:

1. Updating the existing geohydrologic database for these hydrologic subunits,
2. Dividing the North Shore and Grout Creek Hydrologic Subunits into multiple tributary subareas,
3. Evaluating the maximum perennial yield of each tributary subareas using independent methods, and
4. Preparing this report of findings from the analysis.

The geohydrologic database was updated with well production and ground water level data from the Big Bear Lake Department of Water and Power (BBDWP) and precipitation data from the San Bernardino County Flood Control District. In addition, the following reports were consulted for the analysis and in the preparation of this report:

- Re-evaluation of the Maximum Perennial Yield Big Bear Lake Watershed and a Portion of Baldwin Lake, GEOSCIENCE, 2001.

- Geohydrological Investigation of the Moon Camp Area, Big Bear Valley, California, GEOSCIENCE, 2001.

- Estimating Hydrology and Hydraulic Parameters for HSPF, United States Environmental Protection Agency, 2000.

- An Interactive Database of HSPF Model Parameters, Version 1.0, United States Environmental Protection Agency, 1999.

- Geohydrology of Big Bear Lake and Baldwin Lake Drainage Areas, Glenn A. Brown & Associates, 1974.

3.0 METHODOLOGY

Maximum perennial yield is defined as:

> *The maximum quantity of ground water perennially available if all possible methods and sources are developed for recharging the basin. This quantity depends on the amount of water economically, legally, and politically available to the organization or agency managing the basin (Todd, 1980).*

By definition, the maximum perennial yield is some portion (i.e. subset) of the total amount of ground water recharge that the aquifers receive from precipitation on an average annual basis. Not all of the water that reaches the ground water aquifer can be developed for beneficial use because either it is not economically feasible, or there is no legal right to the water, or political constraints prevent or inhibit development.

Estimating the average annual ground water recharge involves relating geohydrologic and ground water basin operational factors in a quantitative form. It requires a detailed understanding of the basin's inflow terms (including all precipitation, infiltration, and other recharge), and outflow terms (including ground water extraction, evapotranspiration, and losses to the surface and/or adjacent ground water reservoirs). When possible, inflow and outflow terms are obtained from measured data, such as:

- Long-term precipitation records from weather stations within the Big Bear Lake watershed,
- Evapotranspiration data from evaporation pans and weather stations within the watershed,
- Ground water levels, and
- Ground water production.

However, most of the factors that affect the inflow and outflow terms that are required for a detailed evaluation of the ground water recharge have to be estimated or assumed from data collected outside the Grout Creek and North Shore subunits or outside the Big Bear Lake Watershed. Although the values are published and are from reliable sources (i.e. the U.S. Environmental Protection Agency, United States Geological Survey, etc.), they are not specific to the area of interest.

The lack of measured hydrologic data in the Grout Creek and North Shore Hydrologic subunits and corresponding assumptions necessary to estimate average annual ground water recharge (from which the maximum perennial yield can be evaluated) results in a relatively wide range of possible ground water recharge values for any given hydrologic subunit or tributary subarea. As more hydrologic information is collected, the range in ground water recharge estimates will narrow. Hydrologic data that, if measured in the Grout Creek and North Shore areas, would have the greatest impact on the ground water recharge/perennial yield estimates for the subunits and tributary subareas (and the Big Bear Lake Watershed as a whole) would include:

- Ground water monitoring wells in each of the tributary subareas,
- Additional information from private wells in each of the tributary subareas,
- Stream flow discharge (as would be measured from stream gages) for the major tributaries in the Grout Creek and North Shore subunits;
- Additional weather stations in the Grout Creek and North Shore subunits that would be equipped with instrumentation to measure:
  - Precipitation (including snow accumulation),
  - Ambient air temperature,
  - Vertical and horizontal wind speed and direction,
  - Relative humidity,

- Barometric pressure,
- Water vapor density,
- Solar radiation,
- Soil temperature,
- Soil heat flux, and
- Soil moisture content;

- Evaporation pans at each weather station location; and

- Pumping tests in selected wells to obtain aquifer parameters.

It should be noted that surface water infiltration testing currently being conducted in the Big Bear Valley as part of the Big Bear Area Regional Wastewater Agency Groundwater Replenishment Study will also provide valuable information on the recharge characteristics of the sediments between the land surface and ground water table.

Where possible, multiple methods were utilized to estimate the average annual ground water recharge of the various tributary subareas of the North Shore and Grout Creek Hydrologic Subunits. The methods considered were:

- Ground Water Underflow Calculation - Darcian Flow
- Watershed Model

The methods employed for the analysis are described in more detail in the following subsections.

3.1 Delineation of Tributary Subareas

Prior to conducting the maximum perennial yield analysis, the North Shore and Grout Creek Hydrologic Subunits were subdivided into multiple tributary subareas (see Figure 2). Tributary

subareas represent smaller surface water drainage subbasins within the larger hydrologic subunit. Thus, the boundaries of the subareas represent surface water drainage divides. For most of the hydrologic subunits, it is assumed that the surface water drainage divides also represent ground water flow divides, particularly in areas where bedrock is exposed at the ground surface. However, in areas of the North Shore and Grout Creek subunits where the surface water drainage boundaries transect unconsolidated alluvium, which occurs on the lower slopes and in the southeast portion of the North Shore Subunit, the drainage divides do not necessarily represent ground water flow divides. In these areas, the ground water within one subarea/subunit can be in hydraulic communication with adjacent subareas/subunits.

The North Shore Subunit was subdivided into six tributary subareas (A through E) and the Grout Creek Subunit was subdivided into four tributary subareas (A through D). The subareas were determined through hydrological analysis of a digital elevation model using a Geographic Information System (GIS). Tributary subareas in the North Shore Subunit range in area from 247 to 828 acres with a total subunit area of 3,559 acres. Tributary subareas in the Grout Creek Subunit range in area from 592 to 1,668 acres with a total subunit area of 4,184 acres.

3.2 Ground Water Underflow Calculation – Darcian Flow

The Underflow Method (Roscoe-Moss, 1990) provides an estimate of ground water recharge moving through permeable formations (i.e. aquifers) within the watershed. This method is based on Darcy's Law and was determined only for the alluvial aquifers with available data. In this case, only Grout Creek has enough available information to perform an estimate of ground water underflow.

The underflow calculation utilized average transmissivity, aquifer width, and hydraulic gradient to solve Darcy's Law through the use of a flow net. Transmissivity values for the underflow calculations were obtained from pumping tests and lithologic data of wells within and/or

immediately adjacent to each respective flow net. Hydraulic gradient and aquifer width were obtained from a ground water level contour map.

It should be noted that the underflow calculation only accounts for outflow in the alluvial aquifer and does not account for outflow through the bedrock in the subunit. It is assumed that some outflow occurs within the bedrock aquifer, which explains why the underflow estimate for the Grout Creek Subunit is lower than the ground water recharge estimate from the watershed model (described below). Previous perennial yield estimates (GEOSCIENCE, 2001) have been based on the assumption that production of water from the bedrock aquifer is not as economically feasible as production of water from the alluvial aquifer.

3.3 Watershed Model

Another method used to estimate the average annual ground water recharge was through the use of a watershed model. The watershed model is a computer tool that assists in solving the water balance, or hydrologic budget, for each tributary subarea. The water balance takes into account all of the quantifiable hydrologic variables that affect the water resources of the catchment. These variables include daily precipitation, surface water infiltration, surface water runoff, evapotranspiration, and deep percolation (see Figure 3). The deep percolation term given by the watershed model is considered an estimate of the average annual ground water recharge.

The model code used for the Big Bear Lake Watershed model was the Hydrological Simulation Program Fortran (HSPF; EPA, 1997). This program uses measured precipitation and potential evapotranspiration[1] (PET) to estimate surface water runoff, actual evapotranspiration[2] (ET), and

[1] The amount of water that would be lost to the atmosphere through evaporation and uptake by plants (transpiration) under a given climatic condition if there were unlimited soil moisture.

[2] The amount of water that would be lost to the atmosphere through evaporation and uptake by plants (transpiration) under a given climatic and soil moisture condition.

ground water recharge within the watershed. Input data were formatted for the model using the code Generation and Analysis of Model Simulation Scenarios (GenScn).

A watershed model was developed, based on the watershed model developed for GEOSCIENCE (2001), to assess ground water recharge in each of the tributary subareas for the North Shore and Grout Creek Subunits. In addition to refining the tributary subareas of each subunit, input parameters for the model were selected according to the most recent EPA guidelines for estimating hydrology and hydraulic parameters specific to HSPF (EPA, 2000).

3.3.1 Conceptual Watershed Model

As any given volume of precipitation falls within a watershed or, in this case, tributary subarea, it is ultimately subject to multiple fates as shown on Figure 3. Interaction of precipitation with the ground surface will generally determine the volume of streamflow within the subarea. Among the processes that actively govern streamflow at the ground surface are initial abstraction, infiltration, and overland flow. Ground water recharge occurs if the amount of infiltration exceeds the capacity of the soil to hold the water.

3.3.1.1 Initial Abstraction

A portion of the precipitation falling on the watershed tributary subarea is intercepted by vegetation and other above ground objects, such as buildings, and is defined as interception. Part of the intercepted precipitation wets and adheres to these objects before returning to the atmosphere through evaporation. This mechanism is called "interception loss".

The water that does reach the ground during precipitation events can follow several pathways that do not necessarily result in ground water recharge. Almost immediately, some of the water is evaporated from the soil surface. Some precipitation is temporarily stored in topographic

depressions (i.e. "depression or surface detention storage") where it can slowly infiltrate into the subsurface or evaporate. Some precipitation infiltrates into the shallow subsurface where it is either evaporated back out of the soil zone or is utilized by plants. The effects of vegetation interception, transpiration, evaporation, and depression storage are combined to determine a volume of water that is referred to as "initial abstraction" or "initial loss."

In summary, of the precipitation that reaches the ground surface within any given watershed, a substantial portion is prevented from percolating to the ground water due to:

- Interception by impermeable surfaces (rocks, concrete, etc.) and evaporated,
- Evaporation directly off of the ground surface,
- Evaporation out of the shallow soil zone, and
- Interception and utilization by plants.

Previous evaluations of natural ground water recharge in southern California have resulted in estimates in the range of 3 to 7 percent of precipitation (MWD, 1999). This is also consistent with recharge studies in similar climatic settings in other parts of the southwestern United States (Daniel B. Stevens & Associates, 1996).

3.3.1.2 Infiltration and Interflow

A portion of the precipitation that reaches the ground surface infiltrates into the shallow subsurface. This infiltration is a function of many variables, including (but not limited to) soil permeability, vegetation type and cover, surface slope, precipitation intensity and duration, and the ambient moisture content of the soil. If the supply rate of precipitation is greater than the capacity of the soil to accommodate it, infiltration will occur into the shallow subsurface.

Movement of infiltrating water in the shallow subsurface is known as interflow. Infiltration rate is highly dependent on soil permeability and, if low permeability layers exist above the water

table, infiltrating water can temporarily pond in these areas(a condition known as interflow detention storage). Depending on the permeability of the soil and the amount of infiltrating water, some of the water will evaporate back out of the soil and some will percolate to the ground water as recharge.

3.3.1.3 Overland Flow

If the volume of precipitation that reaches the ground surface exceeds the initial abstraction, overland flow occurs and collects to form small rivulets, which eventually lead to streams (known as routing). Because infiltration occurs at the same time as overland flow, the relationship between the two processes must be considered. For example, spatial variations in the infiltration characteristics of the ground cover will allow overland flow in some areas and not others.

3.3.1.4 Ground Water Recharge

If the volume of water in the shallow soil zone exceeds the field capacity (the amount of water that can be held by the soil particles without draining away) and the amount that is evaporated or consumed by plants (ET), it will percolate to the ground water surface as recharge. Depending on the depth to ground water, some of this water may still be subject to ET.

3.3.2 Model Input

3.3.2.1 Model Subareas

After subdividing the North Shore and Grout Creek Hydrologic Subunits into tributary subareas, hydrologic parameters (i.e. topographic characteristics, precipitation, and ET) unique to each

subarea were then assigned to the model. Watershed model simulations were carried out for each tributary subarea within the respective hydrologic subunits.

3.3.2.2 Precipitation

The only inflow term into the watershed model is precipitation because all of the Big Bear Lake Watershed s available water resources are from precipitation. A summary of annual precipitation data from the Big Bear Lake Dam station is provided in Table 1. A precipitation isohyetal map from the San Bernardino County Flood Control District, based on precipitation records collected from Big Bear area weather stations between 1870 and 1970 is shown on Figure 4.

From the isohyetal map, a long-term weighted mean precipitation was assigned to each tributary subarea (see Figure 4). This long-term weighted mean precipitation was the basis for input into the watershed model. However, because the watershed model requires daily precipitation, daily precipitation input values had to be calculated for each tributary subarea. Daily precipitation input was calculated for each tributary subarea as the daily precipitation from the Big Bear Lake Dam Weather Station multiplied by an adjustment factor to account for the decrease in average annual precipitation from the dam eastward (see Figure 4). The adjustment factor is the long-term weighted mean annual precipitation of each tributary subarea divided by the measured mean annual precipitation of the Big Bear Lake Dam Weather Station.

As an example, the long-term weighted mean precipitation for Tributary Subarea A of the Grout Creek Hydrologic Subunit is 33.44 inches per year. The long-term average precipitation for the Big Bear Lake Dam Weather Station is 34.6 inches per year. The adjustment factor for daily precipitation input to Grout Creek Tributary Subarea A of the watershed model is 33.44 divided by 34.6 or 0.97. Thus, the daily precipitation values assigned to this subarea of the model are the daily precipitation values from the Big Bear Lake Dam Weather Station, each multiplied by 0.97.

3.3.2.3 Potential Evapotranspiration

Daily potential evapotranspiration (PET) for the Big Bear Lake area was estimated based on monthly evaporation records from the BBCCSD pan (see Figure 4). Annual evaporation records are summarized in Table 2. Average monthly evaporation, as measured from the BBCCSD pan ranges from 0.16 inches in February to 8.4 inches in July.

3.3.2.4 Other Input Parameters

In addition to measured and calculated input parameters, HSPF requires additional parameters that must be assumed for areas where measured hydrologic data are not available. For the Big Bear area, 18 of the 20 required input parameters were estimated from ranges of values published in United States Environmental Protection Agency (EPA) guidelines because measured data for those parameters were not available (EPA, 2000). The EPA guidelines are based on a database of measured data for each parameter collected from sites across the continental United States. Thus, the published values are not specific to any particular area.

Published parameter values from the EPA guidelines include a typical maximum and minimum range and a possible maximum and minimum range (see Table 3). Statistically, it is more likely that any given parameter for a specific area of the United States would fall into the typical range of values. However, the possible range is included to consider areas where non-normal conditions could exist. For the Grout Creek and North Shore watershed model, the average of the typical and possible ranges of input parameters provided the range of input values used in the model.

3.3.3 Model Output

3.3.3.1 Surface Runoff

The precipitation that reaches the ground surface (after interception) is separated into infiltration, interflow storage, surface detention storage, or runoff. The amount of water allotted to infiltration and interflow storage is a function of the infiltration characteristics of the soils within the model subarea and the slope of the land surface.

When precipitation amounts exceeded soil infiltration capacity, the balance of available water was separated into surface runoff, which was estimated using the Chezy-Manning equation (Crawford and Linsley, 1966) and an empirical expression that relates runoff depth to depression storage. The rate of surface runoff is determined by the following equation:

$$R = (t)(r)(D_s)(1+0.6(D_s/D_{se})^3)^{1.67}$$

where:

R = Surface Runoff, [inches/t]

t = Time Interval, [hr/interval]

r = Routing Variable, [unitless]

D_s = Mean Surface Detention Storage Over the Time Interval, [inches]

D_{se} = Equilibrium Surface Detention Storage (inches) for Current Supply Rate

The routing variable is given by the following equation:

$$r = 1{,}020\sqrt{S_{LS}}/(n)(l)$$

where:

S_{LS} = Slope of the Runoff Surface, [ft/ft]

n = Manning Friction Coefficient, [unitless]

l = Length of the Runoff Surface, [ft]

3.3.3.2 Evapotranspiration

Actual ET calculated by the watershed model is represented as a function of the potential ET (PET) described in Section 2.3.2.3 and the sum of ET from surface water, interception storage, the upper soil zone, shallow ground water, and the lower soil zone (i.e. vadose zone). Total PET demand is met from these sources, starting with surface water and proceeding through the other sources in the order listed. For example, the surface water in the model (not including interception storage) will be used up until the PET demand is met. Remaining PET will then be satisfied from interception storage. If interception storage does not meet the PET demand, then water from the upper soil zone will be utilized, etc. The actual ET calculated by the model is the sum of the ET sources used to fulfill the PET demand.

3.3.3.3 Ground Water Recharge

The watershed model calculates ground water recharge (deep subsurface percolation) by subtracting runoff and actual ET from the total precipitation applied to the model area.

4.0 NORTH SHORE HYDROLOGIC SUBUNIT

4.1 Location

The North Shore Hydrologic Subunit is located on the northern side of the Big Bear Lake Watershed and is defined by the drainage catchment south of the ridge associated with Bertha Peak (see Figure 5). The total surface area of the subunit is approximately 3,560 acres. The highest elevation within the subunit is the top of Bertha Peak at an elevation of approximately 8,200 ft amsl. Surface water is drained from the higher elevations to Big Bear Lake via a number of small drainages, including Polique and Minnelusa Canyons.

4.2 Geohydrology

4.2.1 Geology

The predominant rock type within the North Shore Subunit is Paleozoic carbonate rocks of the Furnace Group (FCT), which are exposed at the surface in the higher elevations of the drainage catchment. Scattered outcrops of Mesozoic granitic rock have also been mapped throughout the subunit. Younger alluvium has been deposited in the drainage channels and along the margins of Big Bear Lake. The alluvium is greater than 400 ft thick in the western portion of the subunit (Mooncamp Area) and in the central portion of the subunit (RV Park Well No. 2). In the eastern portion of the subunit, the alluvium is approximately 400 ft thick at Division Well Nos. 6 and 7. Older alluvium is exposed as alluvial fans between the younger alluvium in the lower elevations and the bedrock at the higher elevations.

4.2.2 Ground Water

Ground water in the North Shore Hydrologic Subunit generally occurs in the unconsolidated alluvial deposits on the lower slopes of the surrounding mountains and in the fractures and weathered portions of the bedrock. Ground water in the alluvium occurs at depths ranging from approximately 5 ft in the western portions of the subunit and near the RV Park wells to approximately 50 ft near Division Well Nos. 6 and 7.

Ground water flows by gravity drainage from areas of high elevation (the mountain slopes) into areas of low elevation, ultimately collecting in the sediments beneath Big Bear Lake. Ground water recharge likely occurs as deep percolation of runoff through the younger alluvium and fractures in the bedrock during periods of prolonged precipitation.

The primary sources of ground water discharge from the North Shore Subunit are underflow and ground water pumping from wells within the subunit. The BBDWP currently operates four vertical production wells within the North Shore Subunit (RV Park Well Nos. 1 and 2 and Division Well Nos. 6 and 7). Combined average annual ground water production from BBDWP wells between 1993 and 2002 is 282 acre-ft/yr (see Table 4). An average of approximately 14 acre-ft/yr of the total BBDWP production from this subunit is from the RV Park wells with the remainder from Division Well Nos. 6 and 7 (see Figure 5). Pumping data for the 20 private wells in the subunit were not available. However, assuming that they are domestic sources and that an average single family home uses approximately 200 gpd/yr, it is estimated that production from these wells is approximately 4.5 acre-ft/yr.

Ground water levels in the central portion of the North Shore Hydrologic Subunit, as measured in RV Park Well No. 1, have declined approximately 20 ft between 1996 and 2002 (see Figure 6). The ground water level in this well is relatively stable, however, with most of the decline occurring after year 2000, a period of relatively dry climatic conditions. Ground water levels in Division Well No. 6, located in the eastern portion of the subunit, have declined approximately 80 ft between 1992 and 2003 (see Figure 6). Recent ground water level declines

in the eastern portion of the subunit can also be correlated with dry climatic conditions although the greater degree of decline is also a reflection of higher ground water production in the area.

4.3 Estimates of Average Annual Ground Water Recharge

Average annual ground water recharge in the North Shore Hydrologic Subunit was reevaluated in the context of the six tributary subareas described in Section 2.1 (see Figure 2). Use of the underflow method was not possible because static ground water level data necessary to construct flow nets in the individual tributary subareas, were not available. Accordingly, estimates of average annual ground water recharge were assigned to each tributary subarea using the watershed model only. The construction and monitoring of future monitoring wells and pumping tests in production wells (new or existing) in the tributary subareas would enable the generation of underflow estimates. In addition, the ground water recharge estimates from the watershed model can be refined as additional data, as described in Section 2.0, are collected.

The watershed model described in Section 2.3 was used to assess the average annual ground water recharge specific to each tributary subarea of the North Shore Hydrologic Subunit. Required input parameters for the watershed model for which no measured data were available were obtained from the EPA database of hydrologic parameters (EPA, 2000) as described in Section 2.3.2.4 and summarized in Table 3. The resulting ranges of annual recharge for each of the tributary subareas are summarized in Table 5 and shown on Figure 5.

Based on the watershed modeling results, the estimates of average annual ground water recharge for the North Shore Hydrologic Subunit range from approximately 150 to 430 acre-ft/yr with a midpoint of approximately 290 acre-ft/yr. This range of recharge is approximately 2 to 7 percent of average annual precipitation for the subunit, which is within the range of accepted recharge estimates for other ground water basins in southern California (3 to 7 percent; Metropolitan Water District of Southern California (MWD), 1999). The midpoint of the range is approximately 4.5 percent of precipitation for the subunit. For comparison of the modeling

results, ground water recharge as 3, 5, and 7 percent infiltration of the weighted average of annual precipitation for each of the tributary subareas are summarized in Table 6.

The midpoint of the revised range of average annual ground water recharge estimates for the North Shore Hydrologic Subunit is approximately 30 acre-ft/yr higher than the maximum perennial yield reported in GEOSCIENCE (2001), which was based primarily on ground water level trends in production wells in two isolated portions of the hydrologic subunit. The watershed model results for this study are lower than the watershed model results reported in GEOSCIENCE (2001) as a result of the use of the EPA parameter input database for this study.

Estimates of average annual ground water recharge for the six tributary subareas range from 27 acre-ft/yr (Subarea E) to 73 acre-ft/yr (Subarea B; see Figure 5). These ground water recharge estimates represent the average of the watershed model output range (see also Figure 5), which is based on the average of typical and possible input values. These data suggest that the RV Park wells are producing ground water at a rate (approximately 14 acre-ft/yr) that is well within their subarea s average annual ground water recharge. Combined average annual ground water production from Division Well Nos. 6 and 7 is exceeding that subarea s average annual ground water recharge. However, it is important to note that these wells are in the alluvial portion of the subarea, which is in hydraulic continuity with the alluvial portions of the adjacent hydrologic subunit (i.e. the Division Subunit to the south). Accordingly, production from these wells should be evaluated in the context of the ground water basin in this area and not the watershed tributary to the wells.

4.4 Maximum Perennial Yield

As stated earlier, the maximum perennial yield is the maximum quantity of ground water perennially available if all possible methods and sources are developed for recharging the basin. This quantity depends on the amount of water economically, legally, and politically available to the BBDWP. Given this definition, the maximum perennial yield of the North Shore Hydrologic

Subunit is within the range of average annual ground water recharge specified by the watershed model but is more likely to be in the lower end of the range than the upper end due to the impracticality of developing all of the recharge water. For initial planning purposes, it is recommended that the midpoint recharge estimates for each tributary subarea (see Figure 5) is used as the maximum perennial yield for that subarea until additional data can be collected (i.e. a ground water level history). It should be emphasized that as ground water production is initiated in each subarea, it will be very important to monitor ground water levels in dedicated non-pumping monitoring wells (i.e. key wells) located in each tributary subarea from which ground water is extracted. Future management of the ground water resources in each tributary subarea should rely more on established ground water level thresholds than the perennial yield estimates.

5.0 GROUT CREEK HYDROLOGIC UNIT

5.1 Location of Grout Creek Hydrologic Subunit

The Grout Creek Hydrologic Subunit is located on the northwest end of the Big Bear Lake Watershed and is defined by the drainage catchment between Delamar Mountain and Little Bear Peak to the north and Gray s Peak to the south (see Figure 7). The total surface area of the subunit is approximately 4,184 acres. The highest elevation within the subunit is the top of Delamar Mountain at an elevation of approximately 8,400 ft amsl. The town of Fawnskin is located at the lowest portion of the subunit in the vicinity of Big Bear Lake (elevation of 6,744 ft amsl). The primary surface water drainage feature of the catchment is Grout Creek.

5.2 Geohydrology

5.2.1 Geology

The predominant rock type within the Grout Creek subunit is Mesozoic granitic rock. Younger alluvium has been deposited in the drainage channels and overlies older alluvium, which fills in the remainder of the alluviated portions of the catchment. The thickness of the alluvium is as much as 180 ft at Well 13B01 in the eastern portion of the subunit, and becomes thinner to the west (approximately 100 ft thick).

5.2.2 Ground Water

Ground water within the Grout Creek subunit occurs in both the bedrock and alluvium. The Cedar Dell slant wells are drilled into the Mesozoic granitic rock and typically produce about 20 gallons per minute, collectively. Ground water in the alluvium occurs at depths ranging from approximately 20 to 90 ft and flows to the south toward Grout Bay (Big Bear Lake) at a gradient

of 0.024 to 0.043 ft/ft (see inset on Figure 7). Pumping test and lithologic data from the Barbara Lee Lane Well and specific capacity data from Wells 12P01, 13C01, and Northshore Well Nos. 1, 2, and 3 were used to estimate aquifer transmissivity. Estimates range from 700 to 1,900 gpd/ft.

Ground water recharge likely occurs within the Grout Creek streambed during periods of extended runoff, near the contact between the bedrock and alluvium and, to a lesser extent, as percolation of precipitation directly on the alluvium. Ground water recharge also occurs through fractures in the bedrock formations.

The primary sources of ground water discharge from the Grout Creek subunit are underflow and ground water pumping from wells within the subunit. BBDWP currently operates two vertical production wells, two slant wells in bedrock, and one spring within the Grout Creek subunit. Average annual ground water production from BBDWP wells within the subunit from 1989 to 2002 has been approximately 134 acre-ft/yr (see Table 7). With the exception of pumping from Barbara Lee Lane Well No. 1, all of the municipal ground water production in the Grout Creek Hydrologic Subunit is from Tributary Subarea C (see Figure 7). Pumping data for the 29 private wells in the subunit were not available. However, assuming that they are domestic sources and that an average single family home uses about 200 gpd/yr, it is estimated that production from these wells is approximately 6.5 acre-ft/yr.

5.2.3 Ground Water Levels

Ground water level elevations in North Shore Well Nos. 1 and 3, both located at the discharge end of Tributary Subarea C, have been relatively stable between 1995 and 2003, with seasonal fluctuations and a minor decline during the relatively dry climatic cycle from 1999 to present (see Figure 8).

5.3 Estimates of Average Annual Ground Water Recharge

The average annual ground water recharge of the Grout Creek subunit was estimated using the underflow method and the watershed model.

5.3.1 Ground Water Underflow Calculation

The amount of ground water underflow beneath the Grout Creek subunit was estimated through the flow net shown on Figure 7. This flow net was used in the most recent Maximum Perennial Yield analysis for the Big Bear Lake area (GEOSCIENCE, 2001) and indicated an average annual ground water recharge estimate of approximately 200 acre-ft/yr. It should be noted, however, that the underflow calculation only accounts for outflow in the alluvial aquifer and does not account for outflow through the bedrock in the subunit. It is assumed that some outflow occurs within the bedrock aquifer, which is one reason why the underflow estimate for the Grout Creek Subunit is lower than the perennial yield estimate from the watershed model (described below).

Previous perennial yield estimates (GEOSCIENCE, 2001) have been based on the assumption that production of water from the bedrock aquifer is not as economically feasible as production of water from the alluvial aquifer. For the purposes of this study, however, the bedrock aquifer in the Grout Creek and North Shore Subunits is considered a viable ground water production source and is included in the total perennial yield estimate for the respective subunits.

5.3.2 Watershed Model

The watershed model described in Section 2.3 was used to assess the average annual ground water recharge specific to each tributary subarea of the Grout Creek Hydrologic Subunit.

Assumed input parameters for the watershed model are based on the average of EPA s suggested parameter ranges, which are summarized in Table 3. The resulting ranges of annual recharge for each of the tributary subareas are summarized in Table 8 and shown on Figure 9.

Based on the watershed modeling results, the average annual ground water recharge for the Grout Creek Hydrologic Subunit (Subareas A through D) is estimated to range from approximately 260 to 840 acre-ft/yr with a midpoint of approximately 550 acre-ft/yr. This range of recharge is approximately 2 to 8 percent of average annual precipitation for the subunit. The midpoint of the range is approximately 5 percent of precipitation for the subunit. For comparison of the modeling results, ground water recharge as 3, 5, and 7 percent infiltration of the weighted average of annual precipitation for each of the tributary subareas are summarized in Table 9.

The relative disparity between the average annual recharge estimates obtained from the underflow analysis and watershed model is partly due to the estimated nature of the input parameters used in each analysis. In the case of the underflow analysis, the transmissivity parameter is estimated based on review of lithologic logs and pumping tests in wells within the Big Bear area that are perforated in similar aquifer materials. More representative values can be obtained via formal aquifer pumping tests using the wells in the subunit. For the watershed model, 18 of the 20 required input parameters are estimated from the EPA s database, which is not specific to the mountains of southern California. Additionally, the underflow analysis does not account for all of the recharge within the bedrock. As data are collected in the future, the range of recharge will become less.

The midpoint of the revised average annual ground water recharge for Subareas A through D of the Grout Creek Hydrologic Subunit (549 acre-ft/yr) is approximately 120 acre-ft/yr lower than the average annual ground water recharge from the watershed model reported in GEOSCIENCE (2001) (670 acre-ft/yr). As stated previously, the revised estimate is a result of the use of the EPA parameter input database for this study.

Estimates of average annual ground water recharge for the four tributary subareas range from 66 acre-ft/yr (Subarea D) to 217 acre-ft/yr (Subarea C; see Figure 9). These average annual recharge values represent the average of the watershed model output range (see also Figure 9), which is based on the average of typical and possible input values. These data suggest that average annual ground water production from the Grout Creek Hydrologic Subunit (approximately 134 acre-ft/yr), which occurs almost entirely from Tributary Subarea C, is within the average annual recharge for both the tributary subarea and the hydrologic subunit.

5.4 Maximum Perennial Yield

The maximum perennial yield of the Grout Creek Hydrologic Subunit is within the range of average annual ground water recharge specified by the watershed model but is more likely to be in the lower end of the range than the upper end. As mentioned previously, by definition, maximum perennial yield is the amount of water that can be developed economically, legally and politically. In consideration of this, Subareas A and B of the Grout Creek Subunit are remote and are located on land under the jurisdiction of the United States Forest Service (USFS). There is no established distribution system in Subareas A and B of the Grout Creek Subunit. Furthermore, access to the area would likely require a lengthy negotiation process with the USFS. Given these factors, developing ground water resources in these subareas is not currently practical.

At this time, it is recommended to use the sum of the midpoint recharge estimates for tributary Subareas C and D (217 acre-ft plus 66 acre-ft; see Figure 9) as the maximum perennial yield for the Grout Creek Subunit (total of 283 acre-ft/yr). It should be emphasized that as ground water production is initiated in each subarea, it will be very important to monitor ground water levels in dedicated non-pumping monitoring wells (i.e. key wells) located in each tributary subarea from which ground water is extracted. As was recommended for the North Shore Hydrologic Subunit, future management of the ground water resources in each tributary subarea should rely more on established ground water level thresholds than the perennial yield estimates.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analyses presented in this report, the following have been concluded regarding the maximum perennial yield of the North Shore Hydrologic Subunit:

- The North Shore Hydrologic Subunit can be conveniently subdivided into six tributary subareas (A through F) based on surface water drainage divides;

- The revised range of average annual ground water recharge for the North Shore Hydrologic Subunit as a whole is approximately 150 to 430 acre-ft/yr with a midpoint of approximately 290 acre-ft/yr. The midpoint of the range is approximately 4.5 percent of precipitation for the subunit, which is within the range of accepted recharge estimates for other ground water basins in southern California (3 to 7 percent).

- The midpoint of the average annual ground water recharge estimate (290 acre-ft/yr) is considered a good estimate of maximum perennial yield for the North Shore Hydrologic Subunit, given the available data. However, additional ground water monitoring and geohydrologic data collection are required in each individual subarea to manage the ground water resources in the area as it is developed in the future;

- The revised perennial yield is slightly higher than the previous perennial yield value of 260 acre-ft/yr from the GEOSCIENCE, 2001 report, primarily as a result of the use of an updated EPA input parameter list for the watershed model and the consideration of the bedrock aquifer as a viable source of ground water supply;

- The total ground water recharge for the North Shore Subunit was apportioned to the individual tributary subareas as shown on Figure 5.

- Combined average annual ground water production from Division Well Nos. 6 and 7 is exceeding that subarea s average annual ground water recharge. However, these wells

are in the alluvial portion of the subarea, which is in hydraulic continuity with the alluvial portions of the adjacent hydrologic subunit (i.e. the Division Subunit to the south). Accordingly, production from these wells should be evaluated in the context of the ground water basin in this area and not the watershed tributary to the wells.

For the Grout Creek Hydrologic Subunit, the following is concluded:

- The Grout Creek Hydrologic Subunit can be conveniently subdivided into four tributary subareas (A through D) based on surface water drainage divides;

- The revised range of average annual recharge for the Grout Creek Hydrologic Subunit as a whole is approximately 260 to 840 acre-ft/yr with a midpoint of approximately 550 acre-ft/yr (Subareas A through D). The midpoint of the range is approximately 5 percent of precipitation for the subunit, which is within the range of accepted recharge estimates for other ground water basins in southern California (3 to 7 percent)

- Ground water resources in Subareas A and B of the Grout Creek Subunit would be difficult to develop because they are remote and are located on land under the jurisdiction of the USFS;

- Due to the cost and political limitations associated with ground water development in Subareas A and B, it is currently recommended to use the sum of the midpoint recharge estimates for tributary Subareas C and D (283 acre-ft/yr) as the maximum perennial yield for the Grout Creek Subunit;

- The revised perennial yield (283 acre-ft/year) is higher than the previous perennial yield value of 200 acre-ft/yr from the GEOSCIENCE, 2001 report, primarily as a result of the use of an updated EPA input parameter list for the watershed model and the consideration of the bedrock aquifer as a viable source of ground water supply;

- The total average annual ground water recharge for the Grout Creek Subunit was apportioned to the individual tributary subareas as shown on Figure 9.

Given the possible range of recharge for the North Shore and Grout Creek Hydrologic Subunits, and correspondingly the range of recharge for the individual tributary subareas within each subunit, it is recommended that development planning for tributary subareas be initially based on the maximum perennial yield estimates as described above. However, as ground water production is initiated in each tributary subarea, it will be very important to monitor ground water levels in dedicated non-pumping monitoring wells located in each tributary subarea from which ground water is extracted. The maximum perennial yield is based on long-term precipitation records. However, short-term periods (5 to 10 years) of relatively low precipitation have been observed throughout the period of record. These short-term periods of low precipitation are anticipated to have a significant impact on the ground water levels in the North Shore and Grout Creek Hydrologic Subunits because the storage capacity of the ground water reservoir is relatively small (shallow alluvium underlain by granitic bedrock). For this reason, future ground water production, and development, in each tributary subunit should rely more on established ground water level thresholds than the perennial yield estimates.

Another aspect of maximum perennial yield to consider is the reduction in perennial yield from development. As buildings and roads are built over soil that once was available to receive recharge from precipitation, the amount of surface water runoff will increase and the amount of ground water recharge will decrease. Any proposed future developments should address this issue.

As additional monitoring features (e.g. monitoring wells) are constructed and additional data become available, the perennial yield estimates will be refined. Hydrologic data that, if measured in the Grout Creek and North Shore areas, would have the greatest impact on the perennial yield values for the subunits and tributary subareas (and the Big Bear Lake Watershed as a whole) would include:

- Ground water monitoring wells in each of the tributary subareas,

- Additional information from private wells in each of the tributary subareas,

- Stream flow discharge (as would be measured from stream gages) for the major tributaries in the Grout Creek and North Shore subunits;

- Additional weather stations in the Grout Creek and North Shore subunits that would be equipped with instrumentation to measure:
  - Precipitation (including snow accumulation),
  - Ambient air temperature,
  - Vertical and horizontal wind speed and direction,
  - Relative humidity,
  - Barometric pressure,
  - Water vapor density,
  - Solar radiation,
  - Soil temperature,
  - Soil heat flux, and
  - Soil moisture content;

- Evaporation pans at each weather station location; and

- Pumping tests in selected wells to obtain aquifer parameters.

Of the monitoring features to be developed, first priority should be given to the construction of monitoring wells and the development of a reliable ground water level baseline. From this, ground water level thresholds should be established within which to manage ground water production. As mentioned previously, future ground water production, and development, in each tributary subunit should rely more on established ground water level thresholds than the

perennial yield estimates. Given this, the relative cost of establishing the other monitoring features necessary to refine the maximum perennial yield estimates should be weighed against the relative benefit of refining the maximum perennial yield.

7.0 REFERENCES

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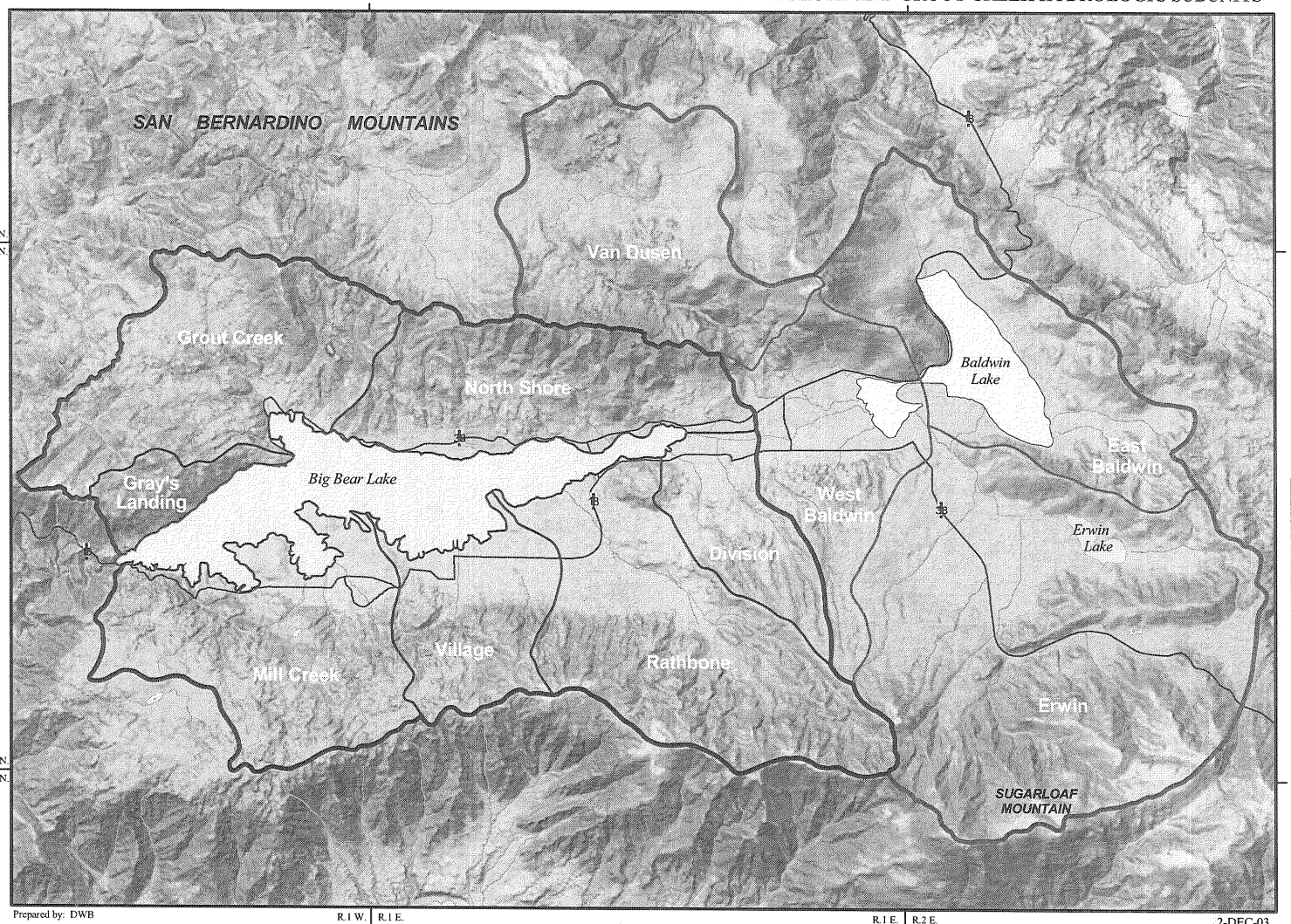
FIGURES

CITY OF BIG BEAR LAKE
DEPARTMENT OF WATER AND POWER

FOCUSED GEOHYDROLOGIC EVALUATION OF THE MAXIMUM PERENNIAL YIELD OF THE NORTH SHORE AND GROUT CREEK HYDROLOGIC SUBUNITS

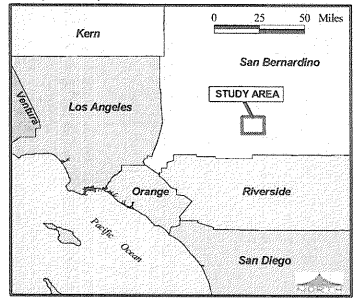


LOCATION OF BIG BEAR VALLEY

EXPLANATION

- Big Bear Lake Watershed Boundary with Hydrologic Subunits
- Baldwin Lake Watershed Boundary with Hydrologic Subunits
- Road
- Surface Water
- Playa Lake
- Creek or River

County Inset Map



Prepared by: DWB

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NORTH

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Map Projection:
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Central Meridian: -117 degrees

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Figure 1

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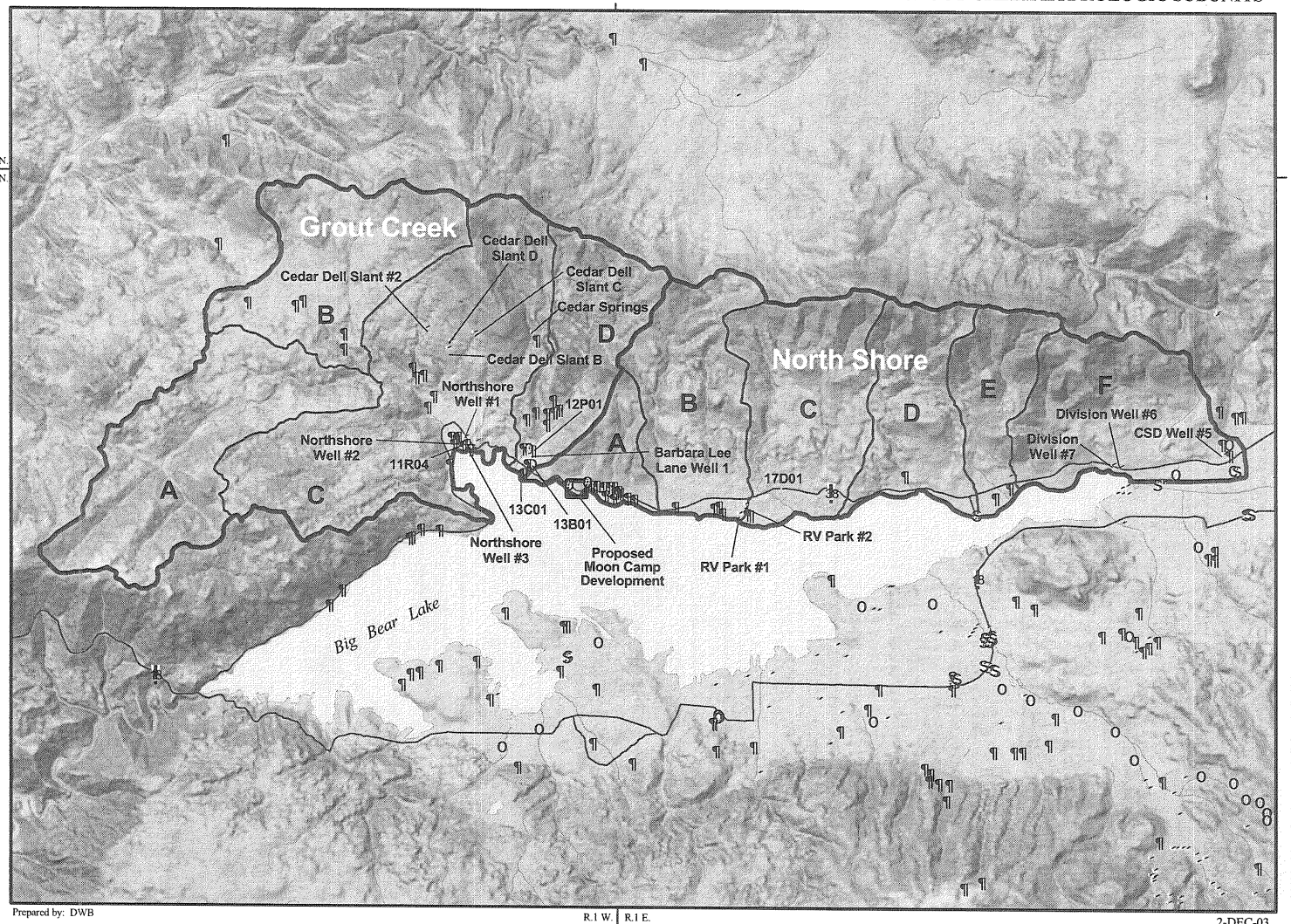
CITY OF BIG BEAR LAKE
DEPARTMENT OF WATER AND POWER

FOCUSED GEOHYDROLOGIC EVALUATION OF THE MAXIMUM PERENNIAL YIELD OF THE NORTH SHORE AND GROUT CREEK HYDROLOGIC SUBUNITS



NORTH SHORE AND GROUT CREEK TRIBUTARY SUBAREAS

EXPLANATION

- Big Bear Lake Watershed Boundary with Hydrologic Subunits
- A — Tributary Subarea

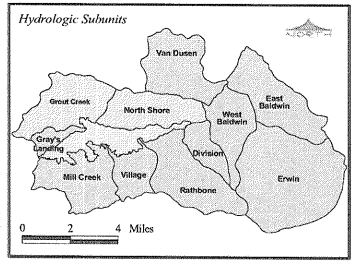
Well Use Classification

- Irrigation
- S — Monitoring
- Municipal
- Private
- O — Test Borehole
- O — Test Well
- Y — Unknown

Well locations were determined from City of Big Bear Lake Department of Water and Power, Big Bear Community Services District records, and DWR Well Drilling Logs.

Note: Only Municipal Wells in North Shore and Grout Creek Subunits are labeled.

- Road
- Surface Water
- Creek or River
- Proposed Moon Camp Development



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Central Meridian: -117 degrees

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Figure 2

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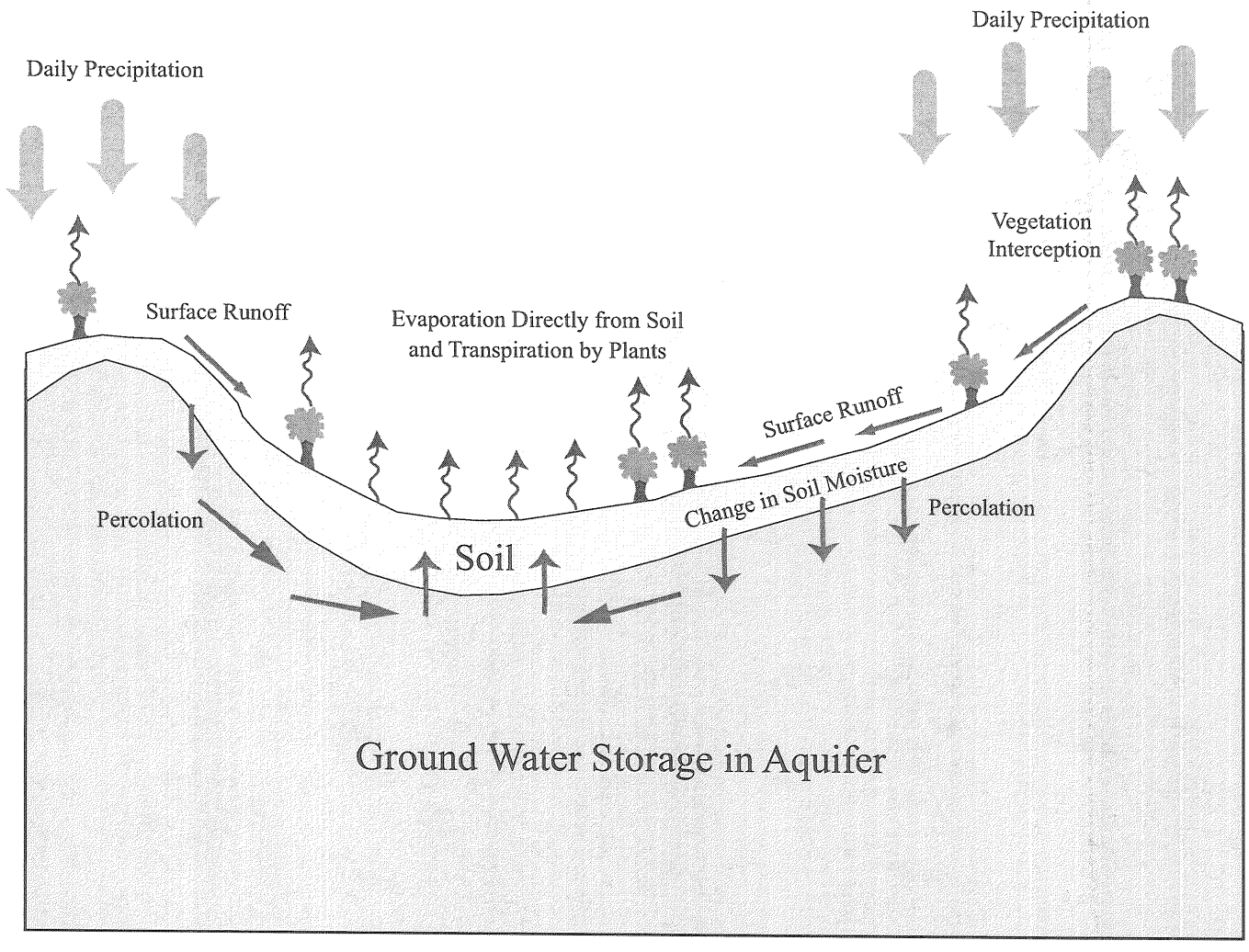
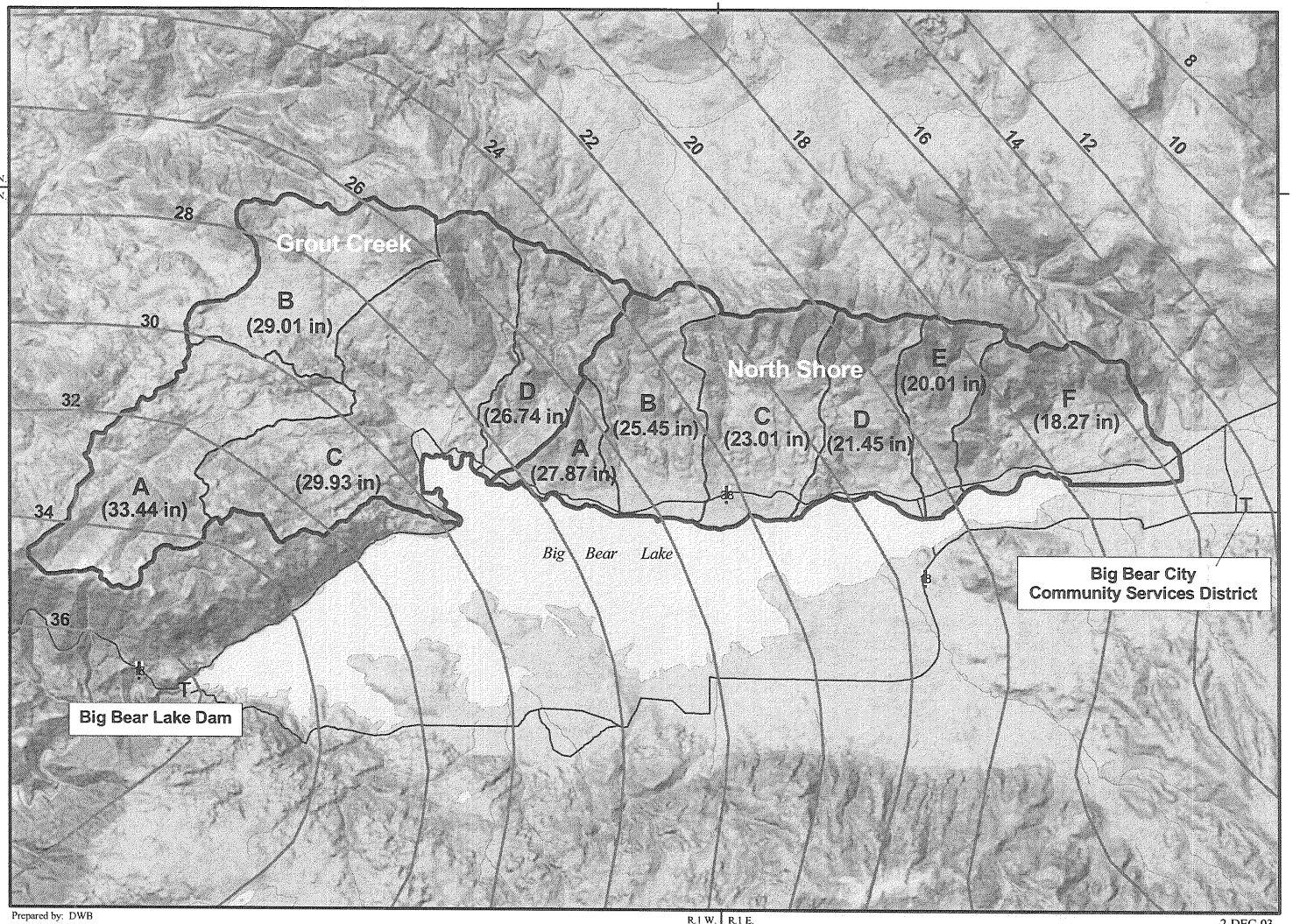


Figure 3	Drawn: DWB	CITY OF BIG BEAR LAKE DEPARTMENT OF WATER AND POWER	GEOSCIENCE
	Checked: TH	SCHEMATIC DIAGRAM OF WATERSHED MODEL	GEOSCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909)920-0707 Fax: (909)920-0403 E-mail: email@geoscience-water.com
	Approved: DEW		
JN 512-03	Date: 2-DEC-03		

CITY OF BIG BEAR LAKE
DEPARTMENT OF WATER AND POWER

FOCUSED GEOHYDROLOGIC EVALUATION OF THE MAXIMUM PERENNIAL YIELD OF THE NORTH SHORE AND GROUT CREEK HYDROLOGIC SUBUNITS



ISOHYETALS IN THE GROUT CREEK AND NORTH SHORE SUBUNITS

EXPLANATION

- 26 — Average Annual Precipitation (in.) 1870 - 1970 (Source: San Bernardino County Flood Control District)
- Big Bear Lake Watershed Boundary with Hydrologic Subunits
- A — Tributary Subarea
- (33.44 in) — Tributary Subarea Weighted Mean Annual Precipitation (in.)
- Weather Station San Bernardino County Flood Control District
- Road
- Surface Water
- Creek or River

Prepared by: DWB

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Map Projection:
UTM Zone 11, NAD27
Central Meridian: -117 degrees

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Figure 4

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CITY OF BIG BEAR LAKE
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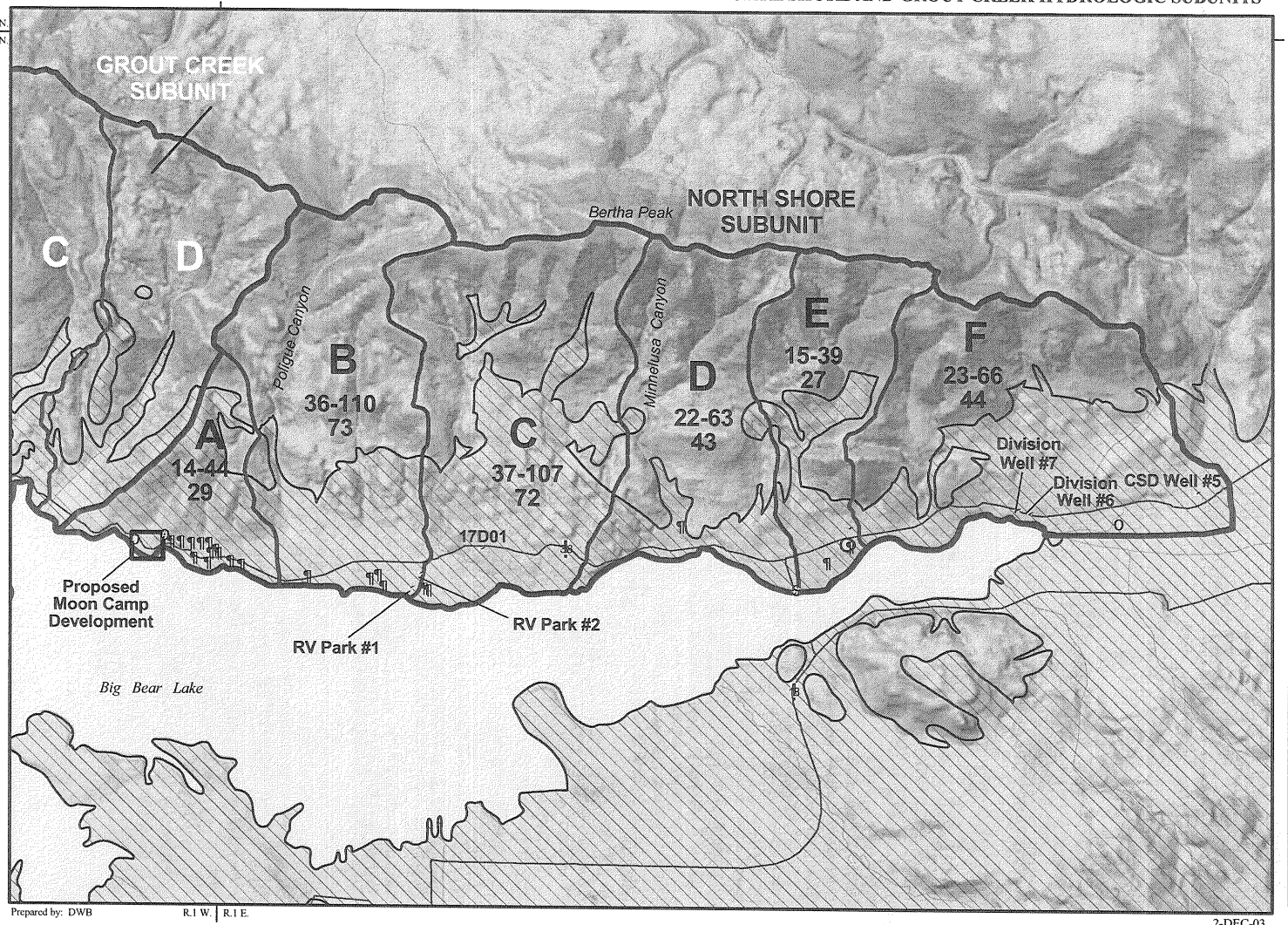
FOCUSED GEOHYDROLOGIC EVALUATION OF THE MAXIMUM PERENNIAL YIELD OF THE NORTH SHORE AND GROUT CREEK HYDROLOGIC SUBUNITS



NORTH SHORE HYDROLOGIC SUBUNIT WITH TRIBUTARY SUBAREAS AND AVERAGE ANNUAL GROUND WATER RECHARGE ESTIMATES

EXPLANATION

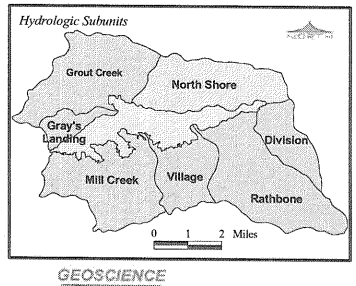
- Big Bear Lake Watershed Boundary with Hydrologic Subunits
- A — Tributary Subarea

Tributary Subarea Modeled Estimated Average Annual Ground Water Recharge

- 15-44 — Watershed Model Range (acre-ft/yr)
- 30 — Watershed Modeled Average (acre-ft/yr)

Well Use Classification

- Irrigation
- Monitoring
- Municipal
- Private
- Test Borehole
- Test Well
- Road
- Surface Water
- Creek or River
- Proposed Moon Camp Development
- Alluvial / Bedrock Boundary (Patterned Area is Alluvium)



Map Projection:
UTM Zone 11, NAD27
Central Meridian: -117 degrees

Well locations were determined from City of Big Bear Lake Department of Water and Power, Big Bear City Community Services District records, and DWR Well Drilling Logs.
Note: Only Municipal Wells are labeled.

NORTH
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Figure 5

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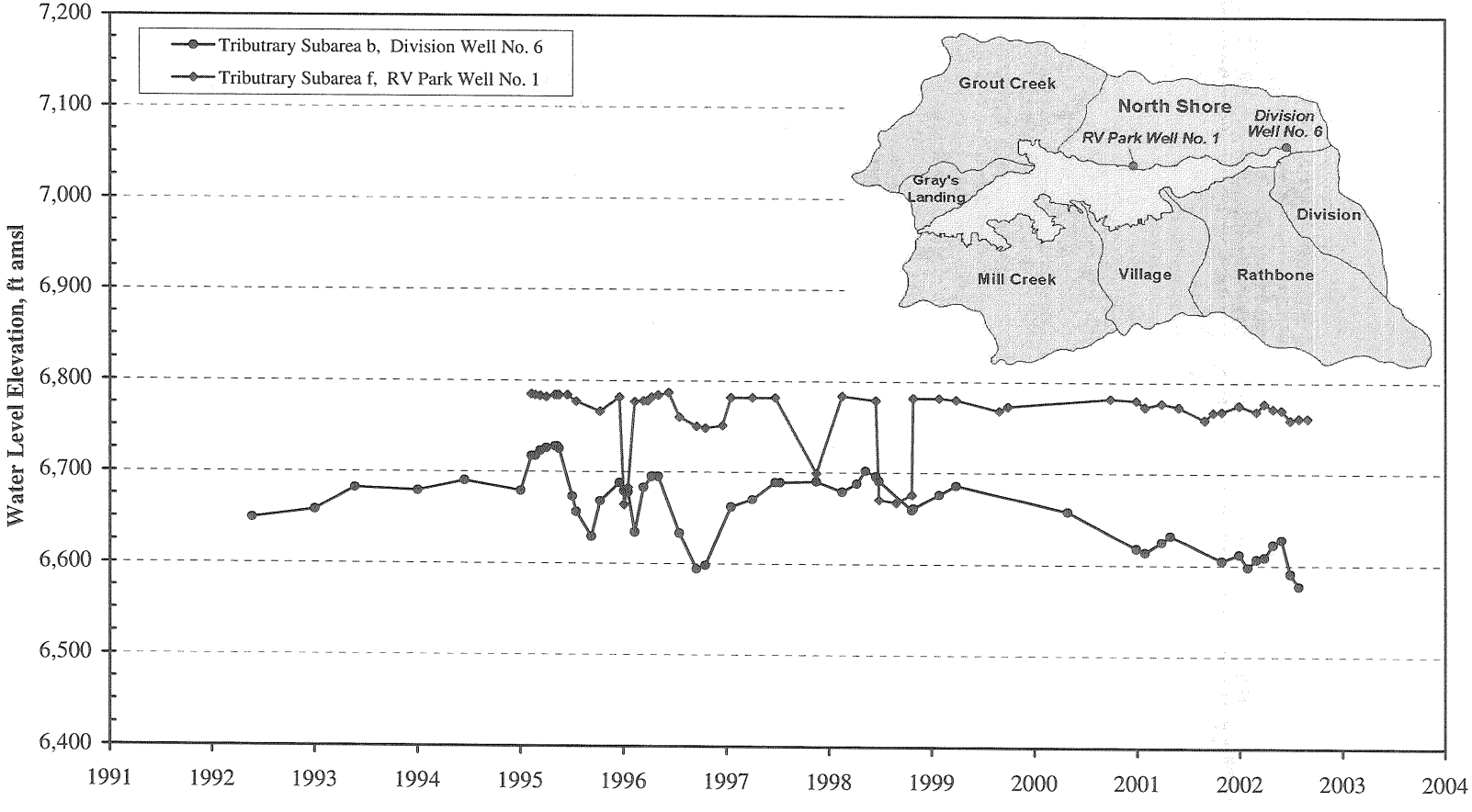
Hydrographs
North Shore Hydrologic Subunit



Source of Data: City of Big Bear Lake Department of Water and Power

Figure 6

CITY OF BIG BEAR LAKE
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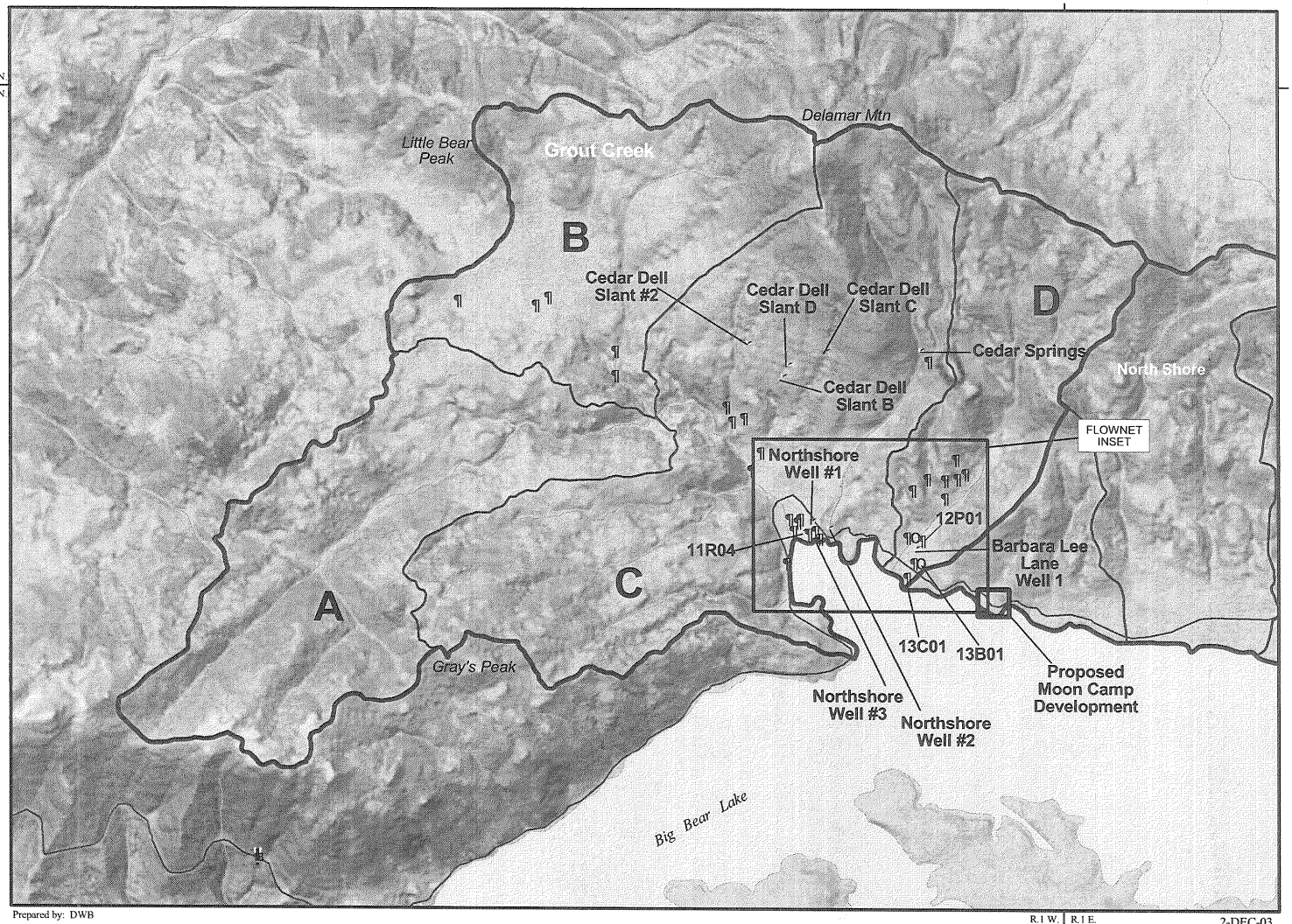
FOCUSED GEOHYDROLOGIC EVALUATION OF THE MAXIMUM PERENNIAL YIELD OF THE NORTH SHORE AND GROUT CREEK HYDROLOGIC SUBUNITS



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Map Projection:
UTM Zone 11, NAD27
Central Meridian: -117 degrees

GROUT CREEK HYDROLOGIC SUBUNIT WITH TRIBUTARY SUBAREAS

EXPLANATION

- Big Bear Lake Watershed Boundary with Hydrologic Subunits
- A — Tributary Subarea

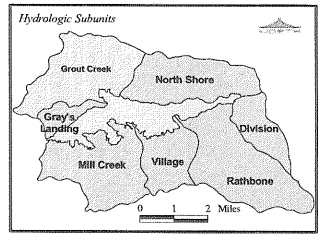
Well Use Classification

- Municipal
- Private
- Test Well

Well locations were determined from City of Big Bear Lake Department of Water and Power, Big Bear City Community Services District records, and DWR Well Drilling Logs.

Note: Only Municipal Wells are labeled.

- Proposed Moon Camp Development



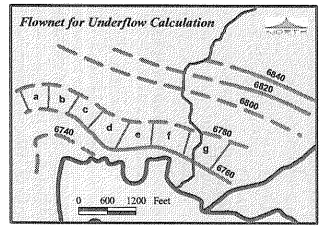


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Figure 7

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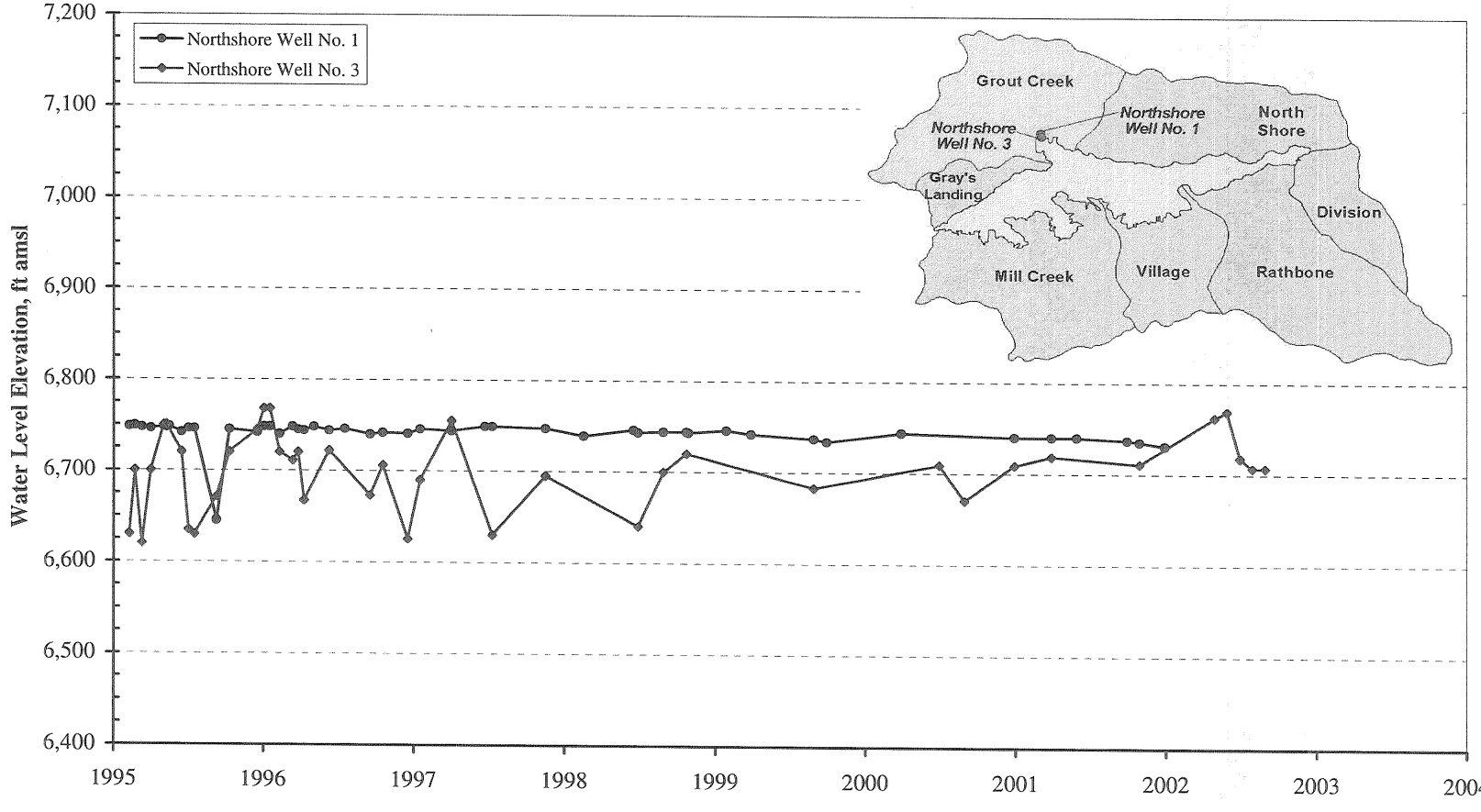
Hydrographs
Grout Creek Hydrologic Subunit

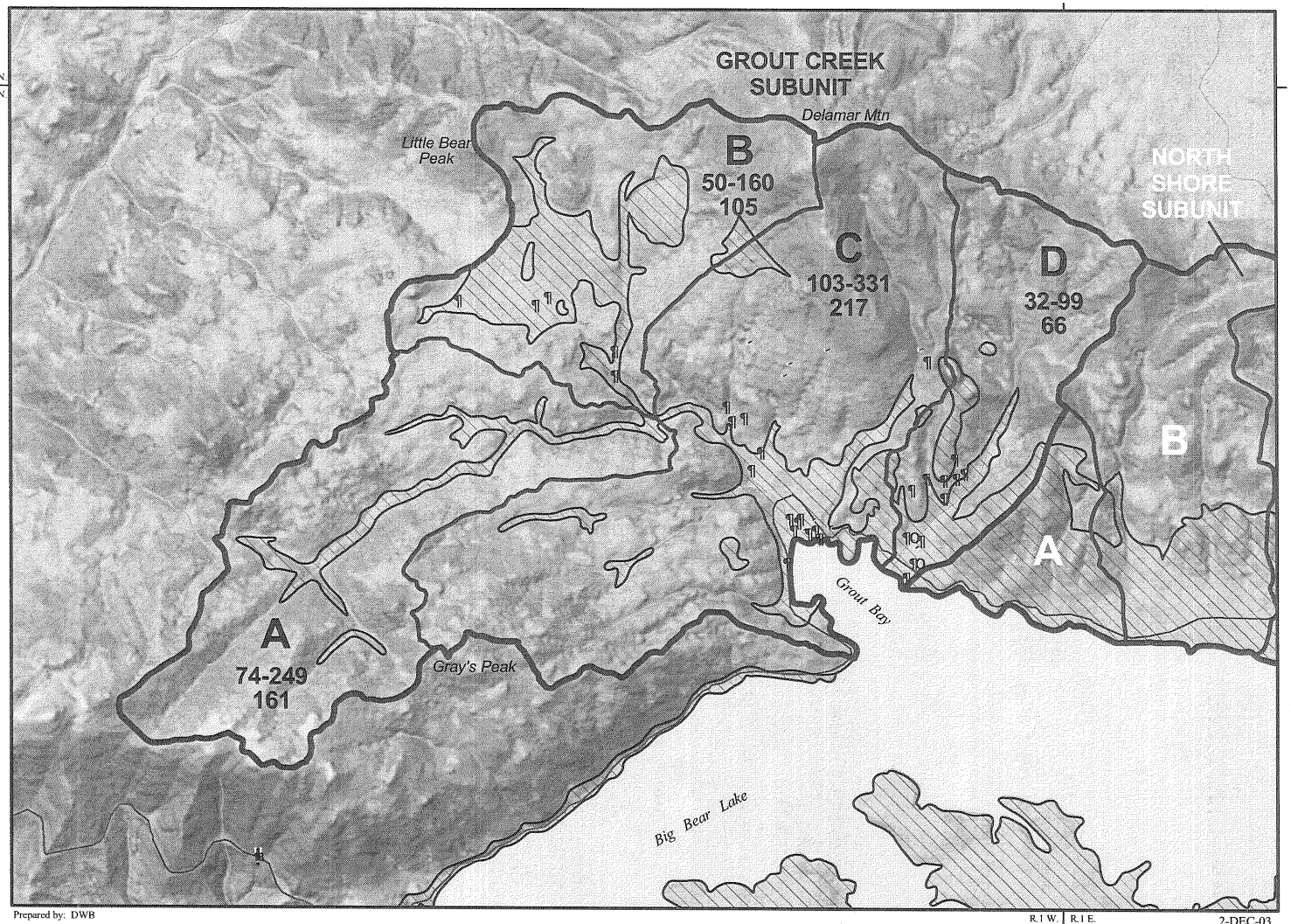


Source of Data: City of Big Bear Lake Department of Water and Power

Figure 8

CITY OF BIG BEAR LAKE
DEPARTMENT OF WATER AND POWER

FOCUSED GEOHYDROLOGIC EVALUATION OF THE MAXIMUM PERENNIAL YIELD
OF THE NORTH SHORE AND GROUT CREEK HYDROLOGIC SUBUNITS



Prepared by: DWB

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Map Projection:
UTM Zone 11, NAD27
Central Meridian: -117 degrees

Well locations were determined from City of Big Bear Lake Department of Water and Power, Big Bear City Community Services District records, and DWR Well Drilling Logs.

Note: Only Municipal Wells are labeled.

NORTH
0 2000 4000 Feet

GROUT CREEK HYDROLOGIC SUBUNIT WITH TRIBUTARY SUBAREAS AND AVERAGE ANNUAL GROUND WATER RECHARGE ESTIMATES

EXPLANATION

- Big Bear Lake Watershed Boundary with Hydrologic Subunits
- A — Tributary Subarea

Tributary Subarea Modeled Estimated Average Annual Ground Water Recharge

- 74-249 — Watershed Model Range (acre-ft/yr)
- 161 — Watershed Modeled Average (acre-ft/yr)

Well Use Classification

- Municipal
- Private
- Test Well
- Road
- Surface Water
- Creek or River
- Alluvial / Bedrock Boundary (Patterned Area is Alluvium)

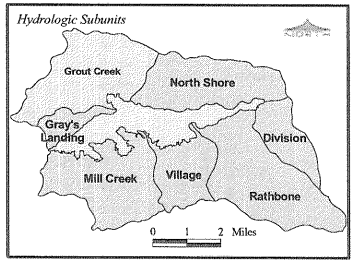

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Figure 9

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TABLES

Table 1

Summary of Annual Precipitation
Big Bear Lake Dam Weather Station

Year	Annual Precipitation [inches]
1950	20.4
1951	39.2
1952	51.5
1953	13.3
1954	47.3
1955	30.3
1956	22.1
1957	49.9
1958	43.9
1959	31.3
1960	28.4
1961	18.6
1962	37.6
1963	32.0
1964	28.5
1965	64.1
1966	35.1
1967	44.6
1968	17.0
1969	85.0
1970	32.5
1971	37.2
1972	15.5
1973	36.1
1974	33.1
1975	23.2
1976	31.9
1977	32.1
1978	59.8
1979	34.9
1980	61.3
1981	16.7
1982	34.4
1983	56.9
1984	18.0

Table 1

Summary of Annual Precipitation
Big Bear Lake Dam Weather Station

Year	Annual Precipitation [inches]
1985	16.8
1986	33.0
1987	29.3
1988	24.2
1989	14.1
1990	17.0
1991	38.5
1992	45.1
1993	73.8
1994	31.6
1995	46.9
1996	40.5
1997	26.9
1998	46.9
1999	13.2
2000	24.7
2001	9.2
2002	38.1
AVERAGE	**34.6**

Source: San Bernardino County Flood Control District.

Table 2

Summary of Annual Evaporation Data
Big Bear City Community Services District Weather Station

Year	Annual Pan Evaporation [inches]
1993	39.0
1994	44.6
1995	44.6
1996	37.1
1997	46.6
1998	NA
1999	NA
2000	NA
2001	NA
2002	NA
AVERAGE	**42.4**

Source: San Bernardino County Flood Control District.
NA = Data not available

HSPF Watershed Model Input Parameters

Name	Definition	Units	Range of Values					
			Typical			Possible		
			MINIMUM	MAXIMUM	AVERAGE	MINIMUM	MAXIMUM	AVERAGE
LZSN	Lower Zone Nominal Soil Moisture Storage	inches	3.0	8.0	5.5	2.0	15.0	8.5
INFILT	Index to Infiltration Capacity	in/hr	0.01	0.25	0.13	0.001	0.50	0.2505
LSUR	Length of overland flow	feet	200	500	350	100	700	400
KVARY	Variable ground water recession	1/inches	0.0	3.0	1.5	0.0	5.0	2.5
AGWRC	Base ground water recession	none	0.92	0.99	0.955	0.85	0.999	0.9245
PETMAX	Temperature below which evapotranspiration is reduced	deg. F	35.0	45.0	40	32.0	48.0	40
PETMIN	Temperature below which evapotranspiration is set to zero	deg. F	35.0	35.0	35	30.0	40.0	35
INFEXP	Exponent in infiltration equation	none	2.0	2.0	2	1.0	3.0	2
INFILD	Ratio of maximum/mean infiltration capacities	none	2.0	2.0	2	1.0	3.0	2
DEEPFR	Fraction of ground water inflow to deep recharge	none	0.0	0.20	0.1	0.0	0.50	0.25
BASETP	Fraction of remaining evapotranspiration from baseflow	none	0.0	0.05	0.025	0.0	0.20	0.1
AGWETP	Fraction of remaining evapotranspiration from active ground water	none	0.0	0.05	0.025	0.0	0.20	0.1
CEPSC	Interception storage capacity	inches	0.03	0.20	0.115	0.01	0.40	0.205
UZSN	Upper zone nominal soil moisture storage	inches	0.10	1.0	0.55	0.05	2.0	1.025
NSUR	Manning's n (roughness) for overland flow	none	0.15	0.35	0.25	0.05	0.50	0.275
INTFW	Interflow inflow parameter	none	1.0	3.0	2	1.0	10.0	5.5
IRC	Interflow recession parameter	none	0.5	0.7	0.6	0.3	0.85	0.575
LZETP	Lower zone evapotranspiration parameter	none	0.2	0.7	0.45	0.1	0.9	0.5

Source: Environmental Protection Agency (2000)

Note: Average values of EPA's typical ranges and possible ranges were used for North Shore and Grout Creek Tributary Subareas watershed models.

Table 3

Table 4

North Shore Hydrologic Subunit
Annual Production

	City of Big Bear Lake Department of Water and Power Wells				
	Division Well No.6	Division Well No.7	RV Park No.1	RV Park No.2	TOTAL
	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]
1976	41.0	-	-	-	41.0
1977	380.0	-	-	-	380.0
1978	276.0	-	-	-	276.0
1979	298.0	-	-	-	298.0
1980	316.0	-	-	-	316.0
1981	380.0	-	-	-	380.0
1982	357.0	-	-	-	357.0
1983	426.0	-	-	-	426.0
1984	293.0	-	-	-	293.0
1985	234.0	-	-	-	234.0
1986	207.0	-	-	-	207.0
1987	-	-	-	-	-
1988	-	-	-	-	-
1989	43.6	52.5	-	-	96.1
1990	129.0	109.4	-	-	238.5
1991	21.3	203.5	-	-	224.8
1992	15.3	196.8	-	-	212.0
1993	21.6	232.6	6.2	1.1	261.4
1994	74.3	200.2	4.2	5.1	283.9
1995	45.5	130.2	4.8	8.9	189.4
1996	98.4	125.0	5.9	9.1	238.4
1997	144.7	171.5	7.0	8.8	332.1
1998	31.6	133.1	9.0	3.3	176.9
1999	80.5	184.8	12.7	4.5	282.6
2000	105.6	188.3	11.0	5.4	310.4
2001	145.6	216.9	12.0	6.1	380.6
2002	173.8	170.8	11.0	6.2	361.8
Average*	92.2	175.3	8.4	5.8	281.7

Source of data: Boyle Engineering (1987).
City of Big Bear Lake Department of Water and Power (2003).

* Average for 1993 through 2002

Summary of Watershed Model Results
North Shore Tributary Subareas

[1]	[2]	[3]	[4]	[5]	[6]
Tributary Subarea	Area [acres]	Annual Precipitation [inches]	Average Ground Water Recharge Typical EPA Parameter Range [acre-ft/yr]	Annual Average Ground Water Recharge Possible EPA Parameter Range [acre-ft/yr]	Annual Ground Water Recharge [acre-ft/yr]
A	247	27.87	14	44	29
B	720	25.45	36	110	73
C	828	23.01	37	107	72
D	558	21.45	22	63	43
E	392	20.01	15	39	27
F	814	18.27	23	66	44
Total	3,559	-	147	429	288

[1] North Shore Tributary Subarea within the North Shore Hydrologic Subunit (see Figure 5).

[2] Area of North Shore Tributary Subarea in the North Shore Hydrologic Subunit.

[3] Average annual precipitation based on period of record from 1870 to 1970. (San Bernardino County Flood Control District).

[4] Maximum annual perennial yield based on EPA's HSPF Watershed Model used with the average of suggested typical parameter range where estimation of the model input parameter was not possible (see Table 3).

[5] Maximum annual perennial yield based on EPA's HSPF Watershed Model used with the average of suggested possible parameter range where estimation of the model input parameter was not possible (see Table 3).

[6] Average of EPA's Typical and Possible Parameter Ranges; [6] = ([4] + [5]) / 2.

Table 5

Ground Water Recharge as Percent Infiltration of Weighted Average Annual Precipitation
North Shore Tributary Subareas

[1]	[2]	[3]	[4]	[5]	[6]
Tributary Subarea	Area (acres)	Annual Precipitation (inches)	Annual Ground Water Recharge at 3% of Annual Precipitation (acre-ft)	Annual Ground Water Recharge at 5% of Annual Precipitation (acre-ft)	Annual Ground Water Recharge at 7% of Annual Precipitation (acre-ft)
A	247	27.9	17	29	40
B	720	25.5	46	76	107
C	828	23.0	48	79	111
D	558	21.5	30	50	70
E	392	20.0	20	33	46
F	814	18.3	37	62	87
Total	3,559	-	197	329	461

[1] North Shore Tributary Subarea within the North Shore Hydrologic Subunit (see Figure 5).

[2] Area of North Shore Tributary Subarea in the North Shore Hydrologic Subunit.

[3] Average annual precipitation based on period of record from 1870 to 1970. (San Bernardino County Flood Control District).

[4] Annual Ground Water Recharge Based on Average Precipitation for North Shore Tributary Subareas; 0.03* [2] * [3] / 12.

[5] Annual Ground Water Recharge Based on Average Precipitation for North Shore Tributary Subareas; 0.05* [2] * [3] / 12.

[6] Annual Ground Water Recharge Based for on Average Precipitation North Shore Tributary Subareas; 0.07* [2] * [3] / 12.

Table 6

Grout Creek Hydrologic Subunit
Annual Production

	City of Big Bear Lake Department of Water and Power Wells									
	Barbara Lee Lane Well No.1	Northshore Well No.1	Northshore Well No.2	Northshore Well No.3	Cedar Dell Slant B	Cedar Dell Slant C	Cedar Dell Slant D	Cedar Dell Slant #2	Cedar Spring	TOTAL
	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]
1980	-	66.0	7.1	19.0	27.5	27.5	-	-	49.1	196.1
1981	-	128.9	4.0	18.7	16.6	16.6	-	-	41.1	225.8
1982	-	100.0	2.1	19.0	12.4	12.4	-	-	38.0	184.1
1983	-	132.9	2.1	15.0	17.0	17.0	-	-	45.1	229.2
1984	-	50.0	1.0	18.1	16.6	16.6	-	-	37.1	139.4
1985	-	92.1	1.0	30.1	19.5	19.5	-	-	27.0	189.1
1986	-	63.8	0.9	18.1	19.5	19.5	-	-	19.0	140.8
1987	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-
1989	5.2	63.2	1.4	3.9	5.2	5.2	-	5.17	0.0	89.2
1990	3.1	106.6	2.4	6.3	9.0	9.0	-	9.01	0.0	145.4
1991	0.0	89.4	1.8	6.0	10.5	10.5	-	10.50	5.5	134.2
1992	0.0	82.5	0.9	8.1	6.9	6.9	-	6.94	20.8	133.1
1993	0.0	68.8	0.1	9.8	21.6	21.6	-	21.62	38.6	182.2
1994	0.0	64.4	0.0	12.6	14.7	14.7	-	14.69	30.9	152.0
1995	0.0	40.7	0.0	8.6	17.2	17.2	-	17.25	43.2	144.3
1996	0.0	66.3	0.0	9.3	11.5	11.5	-	11.51	27.4	137.5
1997	0.0	71.7	0.0	9.1	9.5	9.5	-	9.50	19.8	129.2
1998	0.0	63.8	0.0	6.6	5.7	5.7	-	5.69	32.5	119.9
1999	0.0	68.2	0.0	5.3	14.1	14.1	-	14.14	20.1	136.0
2000	0.0	63.4	0.0	5.5	0.0	20.1	-	20.10	17.9	127.1
2001	0.0	68.1	0.0	7.9	0.0	0.0	-	35.1	14.9	126.0
2002	0.0	80.3	0.0	10.5	0.0	0.0	-	23.3	10.6	124.7
AVERAGE*	**0.6**	**71.2**	**0.5**	**7.8**	**9.0**	**10.4**	**-**	**14.6**	**20.2**	**134.3**

Source of data: BBDWP, Boyle Engineering (1987).
City of Big Bear Lake Department of Water and Power (2003).

* Average for 1989 through 2002

Table 7

Summary of Watershed Model Results
Grout Creek Tributary Subareas

[1]	[2]	[3]	[4]	[5]	[6]
Tributary Subarea	Area (acres)	Annual Precipitation (inches)	Average Ground Water Recharge Typical EPA Parameter Range (acre-ft/yr)	Annual Average Ground Water Recharge Possible EPA Parameter Range (acre-ft/yr)	Annual Ground Water Recharge (acre-ft/yr)
A	1,074	33.44	74	249	161
B	850	29.01	50	160	105
C	1,668	29.93	104	331	217
D	592	26.74	32	99	66
Total	4,184	-	260	839	549

[1] Grout Creek Tributary Subarea within the Grout Creek Hydrologic Subunit (see Figure 7).

[2] Area of Grout Creek Tributary Subarea in the Grout Creek Hydrologic Subunit.

[3] Average annual precipitation based on period of record from 1870 to 1970. (San Bernardino County Flood Control District).

[4] Maximum annual perennial yield based on EPA's HSPF Watershed Model used with the average of suggested typical parameter range where estimation of the model input parameter was not possible (see Table 3).

[5] Maximum annual perennial yield based on EPA's HSPF Watershed Model used with the average of suggested possible parameter range where estimation of the model input parameter was not possible (see Table 3).

[6] Average of EPA's Typical and Possible Parameter Ranges; [6] = ([4] + [5]) / 2.

Table 8

Ground Water Recharge as Percent Infiltration of Weighted Average Annual Precipitation
Grout Creek Tributary Subareas

[1]	[2]	[3]	[4]	[5]	[6]
Tributary Subarea	Area (acres)	Annual Precipitation (inches)	Annual Ground Water Recharge at 3% of Annual Precipitation (acre-ft)	Annual Ground Water Recharge at 5% of Annual Precipitation (acre-ft)	Annual Ground Water Recharge at 7% of Annual Precipitation (acre-ft)
A	1,074	33.44	90	150	209
B	850	29.01	62	103	144
C	1,668	29.93	125	208	291
D	592	26.74	40	66	92
Total	4,184	-	316	526	737

[1] Grout Creek Tributary Subarea within the Grout Creek Hydrologic Subunit (see Figure 7).

[2] Area of Grout Creek Tributary Subarea in the Grout Creek Hydrologic Subunit.

[3] Average annual precipitation based on period of record from 1870 to 1970. (San Bernardino County Flood Control District).

[4] Annual Ground Water Recharge Based on Average Precipitation for Grout Creek Tributary Subareas; 0.03* [2] * [3] / 12.

[5] Annual Ground Water Recharge Based on Average Precipitation for Grout Creek Tributary Subareas; 0.05* [2] * [3] / 12.

[6] Annual Ground Water Recharge Based for on Average Precipitation Grout Creek Tributary Subareas; 0.07* [2] * [3] / 12.

Table 9

APPENDIX A

North Shore and Grout Creek Hydrologic Subunits

Well Information Summary

Well Information Summary - North Shore and Grout Creek Hydrologic Subunits

State Well Number	Well Name	Owner	Type	Orientation	Date Completed	Total Depth [feet]	Casing Diameter [inches]	Well Status	Perforated Interval [feet]	Surface Elevation [feet]	Driller Log	Yield [gpm]	Specific Capacity [gpm/ft]	Hydrologic Subunit
2N/01E-11N01	CSD Well #5	BBCCSD	Municipal	Vertical	1980	157	4	Inactive (1986)	65 - 145	6,766	Yes	165	NA	North Shore
2N/01E-15A	Boring #8	BBCCSD	Municipal	Vertical	1981	585	NA	Abandoned (1981)	NA	6,760	Yes	NA	Variable	North Shore
2N/01E-15C07	Division Well #7	BBDWP	Municipal	Vertical	1986	400	14	Active	50 - 400	6,744	Yes	625	NA	North Shore
2N/01E-15C10	Division Well #6	BBDWP	Municipal	Vertical	1973	400	0-50 = 30 0-400 = 14	Active	50 – 400	6,744	Yes	NA	NA	North Shore
2N/01E-18H01	RV Park #1	BBDWP	Municipal	Vertical	1966	183	8.625	Active	123 - 183	NA	Yes	NA	NA	North Shore
2N/01E-18H05	RV Park #2	BBDWP	Municipal	Vertical	1990	400	8	Active	100 - 400	NA	Yes	NA	NA	North Shore
2N/01W–11A01	Cedar Dell Slant D	BBDWP	Municipal	Horizontal	1964	204	NA	Abandoned	NA	NA	No	NA	NA	Grout Creek
2N/01W–11A02	Cedar Dell Slant C	BBDWP	Municipal	Horizontal	1959	149	NA	Active	NA	NA	No	NA	NA	Grout Creek
2N/01W-11B01S	Cedar Dell Slant #2	BBDWP	Municipal	Horizontal	1998	287	0-126 = 2 126-2870 = 1.75	Active	126 - 287	NA	Yes	75	NA	Grout Creek
2N/01W-11H01	Cedar Dell Slant B	BBDWP	Municipal	Horizontal	1959	122	NA	Inactive	NA	NA	No	NA	NA	Grout Creek
2N/01W-11R01	Northshore Well #1	BBDWP	Municipal	Vertical	1940	NA	NA	Active	NA	NA	No	NA	NA	Grout Creek
2N/01W-11R02	Northshore Well #2	BBDWP	Municipal	Vertical	1968	305	6.625	Inactive (1993)	NA	NA	No	NA	NA	Grout Creek
2N/01W-11R03	Northshore Well #3	BBDWP	Municipal	Vertical	1970	590	6.625	Active	NA	6,780	Yes	NA	NA	Grout Creek
2N/01W-12C01	Cedar Springs	BBDWP	Municipal	Vertical	1966	385	NA	Active	NA	NA	No	NA	NA	Grout Creek
2N/01W-12P03	Barbara Lee Lane Well 1	BBDWP	Municipal	Vertical	1986	172	10	Inactive (1990)	50 – 170	6,800	Yes	NA	NA	Grout Creek

Sources: City of Big Bear Lake Department of Water and Power
Big Bear City Community Services District
Department of Water Resources
San Bernardino County of Environmental Health Services

Appendix A

15.12 Correspondence

RECEIVED
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BIG BEAR AREA
REGIONAL WASTEWATER AGENCY
P.O. Box 517, 122 Palomino Drive, Big Bear City, CA 92314-0517
(909) 584-4018 • FAX (909) 585-4340
Email: info@bbarwa.org • Internet: www.bbarwa.org

February 28, 2002

San Bernardino County Land Use Services Department/Planning Division
385 N. Arrowhead Avenue
San Bernardino, CA 92415-0182

Attention: Tracy Creason

Subject: Notice of Preparation of Environmental Impact Report for RCK Properties, Tentative Tract No. 16136

The Big Bear Area Regional Wastewater Agency (BBARWA) would like to reaffirm the following: BBARWA has a 10" sewer force main located in the shoulder along the south side of North Shore Drive that passes through Tentative Tract 16136. This force main conveys raw sewage from the County of San Bernardino CSA 53-B sewage collection system to the BBARWA Wastewater Treatment Plant. BBARWA is requesting that the following conditions be placed on this project to protect public health and safety:

1. The Conditional Use Permit should require that the project developer relocate the BBARWA 10" force main by installing new pipe so that it is aligned in the south shoulder along the new location of North Shore Drive. The 10" force main in the new North Shore Drive alignment will allow BBARWA access to maintain and repair the sewer force main. The force main should not pass through proper lots within the proposed tract.

2. Air release valves are located at high elevation points along the force main. Air that is vented from the system may cause odors due to hydrogen sulfide gas that develops seasonally due to low sewage flows and long detention times. BBARWA treats the upstream sewage to minimize odors; however, additional measures should be taken to control nuisance odors due to the close proximity to the tract. The Conditional Use Permit should require that the developer install air release valves and vaults at high elevation points on the new force main. Air release vaults should be large enough to enclose 55-gallon drum carbon filters to control odors.

3. Require that the developer submit plans to BBARWA for approval, including the above items, to meet BBARWA requirements.

BBARWA would also like to comment on Section XVI, UTILITIES AND SERVICE SYSTEMS, SUBSTANTIATION a) on page 32 of the ENVIRONMENTAL CHECKLIST FORM. The last sentence reads, "Therefore, the only alternative to connecting to the public sewer system is an on-site wastewater treatment plant..." If the developer should choose to pursue this alternative, you and the developer should be aware that BBARWA has a Joint Powers Agreement and Operating Agreements with its three member agencies (Collecting Agencies), the City of Big Bear Lake, the Big Bear City Community Services District and the County of San Bernardino on behalf of County Service Area 53-B. Operating Agreement #1, Section 3.05, Other Treatment Plant Works, puts restrictions on the construction and operation of wastewater treatment works by the Collecting Agencies within Big Bear Valley. The section reads, "...none of the Collecting Agencies shall construct, install, acquire or operate any plant, enterprise, works or facilities, of any nature whatsoever for the treatment or disposal of any sewage or wastewater from any area whether within of without its service area, without the consent of BBARWA; nor shall any of the Collecting Agencies contract with any agency other than BBARWA for such treatment and disposal. During the term of this agreement all sewage and wastewater collected by the sewage collection system of each of the Collecting Agencies shall be transported and delivered to the Regional System for treatment and disposal therein."

Please contact me if you have any questions.

Sincerely,

BIG BEAR AREA REGIONAL
WASTEWATER AGENCY

Jerry Rang
Plant Superintendent

C: Wilson So, So and Associates

Jr/jr/County Planning 022802

So & Associates Engineers Inc.

16209 KAMANA RD., SUITE 100 • P.O. BOX 1712 • APPLE VALLEY, CA 92307 • PHONE (760) 242-2365 FAX (760) 242-3083

March 13, 2002 137.0020-18

City of Big Bear Lake
Department of Water & Power
PO BOX 1929
Big Bear Lake, CA 92315-1929

Attention: Ms. Dottie Saville
General Manager

Reference: Water Feasibility Study for Tentative Tract 16136 (APN# 0304-091-12,13 and 0304-082-04, Moon Camp Project)

Dear Ms. Saville:

In response to City of Big Bear Lake Department of Water and Power (DWP) request and authorization, our staff has completed a system review and hydraulic analysis to prepare the water feasibility study for Tentative Tract 16136 . We are pleased to submit this Final Report (DRAFT) for your review and approval.

A. PROJECT DESCRIPTION

The proposed project is a housing development located in the Northeast 1/4 of Section 13, Township 2 North and Range 1 West. The proposed project will consist of 92 single family housing lots as shown in Figure 1-B. Each residential lot will be considered as one equivalent dwelling unit (EDU). The average day demand (ADD) and maximum day demand (MDD), based on the number of EDUs is estimated to assess the impact to the existing water system.

Water Demand: Using information from the water production and water sales, the average day water demand per EDU is approximately 450 gallons per day per EDU (gpd/EDU) for the Fawnskin area. The max-day demand as considered takes into consideration that water usage occurs over an 8 to 10 hour period each day.

Average day demand (ADD)	=	92 EDU x 450 gpd/EDU
	=	41,400 gpd
Maximum day demand (MDD)	=	2.5 x ADD/1,440 minutes per day
	=	103,500 gpd (72.0 gallons per minute)

So & Associates Engineers Inc.
16209 KAMANA ROAD, SUITE 100 • APPLE VALLEY, CA 92307
(760) 242-2365 • FAX (760) 242-3083

Fire Flow Requirements: The existing water distribution system was originally designed for about 750 gpm fire flow for two hours. The current requirement per the County Fire Department for the Fawskin area is between 1,000 gpm and 1,500 gpm depending on the building square footage . The fire flow may be further increased to 1,750 gpm in the future. As such, the water distribution system was analyzed to handle the maximum day demand of the proposed development plus fire flow up to 1,500 gpm.

Water Supply and Storage Requirements: The State Health Department requires storage to account for one peak day usage. The DWP typically experiences one peak day during a summer holiday when tourists and part-time residents become full-time users. The coefficient of 450 gpd/EDU and corresponding max-day demand is representative of that day and is the basis for calculating the water supply and storage required for the proposed project as presented in prior discussions and shown below:

Domestic water supply requirement (Max. Day)	= 72.0	gallons per minute
Operational Storage = (0.3 x MDD)	= 31,050	gallons
Emergency Storage = (1.0 x MDD)	= 103,500	gallons
Subtotal (without fire storage)	= 134,550	gallons
Fire Storage (1,500 gpm x 2 hours)	=180,000	gallons

Based on proposed project development requirements (at MDD), two new well(s) will be required to provide a minimum of 72.0 gallons per minute. Developer will be required to deposit funds with DWP for new well construction unless a proven source of supply is provided by the developer at locations satisfactory to DWP and not exceeding sub-basin safe-yields. It is our understanding that the developer is proposing to drill/equip two wells to DWP standards and dedicate these production wells to the Department. Further, within the proposed tract, no individual private irrigation wells will be permitted.

B. WATER DISTRIBUTION SYSTEM REVIEW

The proposed tract is located near the southeast side of Fawnskin which receives water from Cline Miller Reservoir based on the computer simulations. Figure 1-A attached shows the existing distribution piping system near the proposed development and the recommended extension pipeline layout. Referencing the hydraulic grade line of 6,957 feet elevation at Cline Miller Reservoir and the approximate ground elevation at project site from 6,780 to 6,800 feet, the minimum static pressure at the proposed parcel should be around 68 psi.

Under maximum day demands plus residential fire flow of up to 1,500 gpm, the minimum residual pressure of 20 psi can be met, based on the existing hydraulic pipeline model. However, the existing

Cline-Miller reservoir is an old 100,000 gallon concrete reservoir which will not be sufficient to serve the proposed project. The existing site has limited room for a new tank without demolishing the old tank and/or securing additional property. Therefore, we are recommending that the old concrete reservoir be replaced with a new 300,000 to 400,000 gallon storage reservoir. The developer will be required to advance funds towards construction of the new reservoir and 12-inch transmission pipeline.

C. ESTIMATED COST OF SYSTEM IMPROVEMENTS

On-Site Facilities: The owner or developer of Tentative Tract 16136 will be entirely responsible for all costs of internal facilities. On site distribution pipeline must be 8-inches diameter minimum. All site facilities (plumbing, piping, etc) must also meet the requirements of CBBL-DWP, and San Bernardino County Building & Safety Department.

Off-site Facilities: The property owner or developer is responsible for advancing funds towards the construction of a new reservoir (300,000 gallons minimum) at Cline-Miller and the associated 12-inch pipeline. The estimated probable project costs are as follows:

- Construction of a 300,000 gallon (min.) replacement reservoir = $120,000 *
- Construction of about 2,780 lineal feet of 12-inch pipeline = $250,000
- Allowance for project contingency, engineering, and administration = $111,100

- Estimated total probable project cost = $481,100.

*DWP may participate to make it a 400,000 gallon tank.

Water Supply Source: As discussed earlier, the project developer is in the process of drilling/equipping two wells to meet the project's max-day demand.

Connection Fee: The proposed project is required to pay the DWP connection fee (currently $4,086/ EDU) in order to mitigate the project's impact on the existing water system. Based on the estimated 92 EDUs referenced in this report, the total project connection fee is estimated as follows:

92 EDU's X $4,086/EDU = $375,912.

Because the project developer is proposing to drill/equip wells to DWP standards, and will be required to advance funds towards constructing a new reservoir and off-site pipeline, waiver for components of the normal connection fee (source, storage, transmission) discussed above should be discussed with DWP. Any other component of the above $4,086/EDU connection fee will be paid when the developer applies for connection and water service to the DWP system. Additional fees such as plan check, inspection, and monthly user fees are determined by the DWP at the time of application for service.

So & Associates Engineers Inc.
16209 KAMANA ROAD, SUITE 100 • APPLE VALLEY, CA 92307
(760) 242-2365 • FAX (760) 242-3083

D. SUMMARY

The proposed project (Tentative Tract 16136) can be served by the Department's water system in the Fawnskin area provided that the project developer meets with the following requirements:

- Submit water plans (on-site) for review/approval by DWP to make sure that water mains do not conflict with the BBARWA 10-inch sewer force main (which will be relocated at developer's cost).

- Drill and equip the two supply wells to DWP standards and dedicate these facilities and water rights to DWP. Within the proposed tract, no individual private irrigation wells will be permitted.

- Advance funds towards constructing new reservoir and pipeline improvement at Cline-Miller (with an estimated project cost at $481,100) and dedicate these facilities to the Department of Water & Power. If other parcels of land can be benefited by the off-site improvements based on review by DWP's engineer, a "reimbursement agreement" will be considered by DWP.

- Pay other component (except source, storage, and transmission) of the connection fee to DWP at the time of application for water service for specific subdivided parcels.

- Pay plan check, inspection, and water meter installation charges as discussed in this feasibility study report.

- DWP encourages low water usage landscape designs (turf limitation) to achieve water conservation. This may in turn lower the water supply demand. The developer is required to submit landscaping plans for review with DWP.

Information provided in this letter report is valid for a period of one year from the date of the Final Feasibility Report. The above water connection fee and estimated improvement costs will be subject to further inflationary adjustment depending on commencement and completion of the project. We trust that information in this report will be helpful to both the DWP and the project developer.

Very Truly Yours,

Wilson F. So., P.E.
Project Engineer

DEPARTMENT OF WATER AND POWER

4

RECEIVED
MAR 2 2 2002

March 20, 2002

Tracy Creason
Senior Associate Planner
Land User Services Department
County of San Bernardino
385 North Arrowhead Ave.
San Bernardino, CA 92415-0182

RE: TENTATIVE TRACT MAP 16136 (aka Moon Camp)

Dear Ms. Creason:

I have attached a copy of the "Water Feasibility Study" for the above-mentioned project. The feasibility study was prepared by our engineer and outlines what improvements need to be made in order for our Department to serve water to this project

Section VIII (b) of the initial study (Hydrology and Water Quality) noted "no impact". This should be marked as "Potentially Significant Impact". Section. VIII Substantiation (b) also notes that "the project does not include any on-site wells"; however, there are actually two wells on-site which must be drilled/equipped and productive (and dedicated to DWP) in order for us to serve this project.

Ground Water supplies are limited in Big Bear Valley; therefore, those issues should be addressed when preparing the EIR.

Please let me know if you have any additional questions.

Very truly yours,

Dottie Saville
General Manager

G/CorresAdmin/MoonCampInitStdy

41972 Garstin Drive, P.O. Box 1929, Big Bear Lake, CA 92315-1929 (909) 866-5050 FAX (909) 866-3184

BIG BEAR AREA
REGIONAL WASTEWATER AGENCY

P.O. Box 517, 122 Palomino Drive, Big Bear City, CA 92314-0517
(909) 584-4018 • FAX (909) 585-4340
Email: info@bbarwa.org • Internet: www.bbarwa.org

June 18, 2002

Michael Harden
Environmental Analyst
RBF CONSULTING
14725 Alton Parkway
Irvine, CA 92618-2027

Subject: Moon Camp Environmental Impact Report

Dear Mr. Harden:

This is in response to your letter dated June 6, 2002 and the attached Sewer Service Questionnaire for the Moon Camp Residential Subdivision – Tentative Tract Map No. 16136 Environmental Impact Report. The following is a response to your questions:

1. The proposed project would connect to the County Service Area 53B (CSA 53B) sewer system as addressed in the CSA 53B Sewer Feasibility Study report prepared on September 27, 2002. Sewage from the CSA 53B system would be transported via the Big Bear Area Regional Wastewater Agency (BBARWA) North Shore Interceptor/Force Main system to the regional wastewater treatment plant.

   At this time, we anticipate that there will be sufficient capacity for the proposed project. Our Consulting Engineer will verify the capacity by developing a computer model for capacity analysis of the North Shore Interceptor System starting July 1, 2002. The dry weather capacity of the wastewater treatment plant is 4.8 million gallons per day. The annual average influent flow to the treatment plant for 2001 was 2.1 million gallons per day.

2. Refer to the CSA 53B Sewer Feasibility Study report. Since the exact development housing floor plan was not available to the CSA 53B engineer performing the feasibility study, 92 equivalent dwelling units were assumed for the project. A unit wastewater flow coefficient of 215 gpd/EDU (average basis) was typically estimated for the CSA 53B area, with the total average daily flow at 19,780 gallons per day.

3. Implementation of the proposed project would present a significant increase in the service demand based on the estimated flow of 19,780 gallons per day, which represents an

increase of approximately 25% of the current average daily dry weather flow of 80,000 gallons per day.

4. If CSA 53B should approve the project, BBARWA is capable of providing service through its interceptor sewer and regional treatment plant, provided that all required connection fees are paid in full.

5. I addressed other significant project impacts and requirements for the proposed Conditional Use Permit in my letter to Tracy Creason of the San Bernardino County Land Use Services Department/Planning Division, dated February 28, 2002 (enclosed). This included the relocation of the 10" force main and the installation of new air release vaults with odor control units to control potential nuisance odors. The project developer must submit plans for the above mitigation measures to BBARWA for approval. The project developer will be required to pay all costs related to the mitigation measures.

   One other thought, is the potable water supply adequate for this project?

6. The project developer will be required to pay all applicable CSA 53B and BBARWA connection fees as determined by the San Bernardino County Special Districts. Standby fees may be required for unimproved parcels within 200 feet of the available sewer system. The project developer must pay all costs related to the mitigation measures in response No. 5 above.

If you have any questions or require additional information, please contact me at (909) 584-4032, ext. 1#.

Sincerely,
BIG BEAR AREA REGIONAL
WASTEWATER AGENCY

Jerry Rang
Plant Superintendent

Attachments

CC: Tom Sutton, CSA 53B
Dottie Saville, Dept. of Water & Power
Wilson So, So & Associates

BOARD OF TRUSTEES
Dr. Larry Poland
Phil Hamilton
Mrs. Kathleen Campbell-Kite
Gary Thielfoldt
Dr. Ken Turney
Mr. Ronald Peavy
Superintendent

Bear Valley Unified School District

Educating for Success

BEAR VALLEY SCHOOLS
Big Bear Elementary
Big Bear High School
Big Bear Middle School
Glen Martin Elementary
North Shore Elementary
Chautauqua High School
Baldwin Lane Elementary

❖ P.O. Box 1529 ❖ 42271 Moonridge Road ❖ Big Bear Lake, CA 92315 ❖ (909) 866-4631 ❖ Fax (909) 866-2040 ❖

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RBF CONSULTING

SCHOOL FACILITIES QUESTIONNAIRE
MOON CAMP RESIDENTIAL SUBDIVISION – TENTATIVE TRACT MAP NO. 16136
ENVIRONMENTAL IMPACT REPORT
RESPONSES

1. Please list the name and address of all elementary, junior high and high schools that are available to serve the project site.

North Shore Elementary School
765 North Stanfield
P.O. Box 1887
Big Bear Lake, California 9215

Big Bear Middle School
41275 Big Bear Boulevard
P.O. Box 1607
Big Bear Lake, California 92315

Big Bear High School
351 North Maple Lane
P.O. Box 1708
Big Bear Lake, California 92315

2. What is the current enrollment of each school in the vicinity of the project, and what is the maximum capacity of each school?

	Current Enrollment	Maximum Capacity
North Shore Elementary School	614	588
Big Bear Middle School	575	408
Big Bear High School	921	697

3. What is the distance of each school to the project site?

North Shore Elementary School	3.0 miles
Big Bear Middle School	4.5 miles
Big Bear High School	8.0 miles

4. What are the average student generation rates per dwelling unit for the proposed project at each school level? Will new facilities be required?

   The average student generation rate per dwelling unit as calculated in the most recent "Developer Fee Justification and Impact Analysis," October 2000, is .20 students per unit.

   The three schools identified do not have adequate school housing capacity, and replacement facilities are required.

5. Do you anticipate that project implementation would result in the need for physical additions to your school district (*i.e.*, construction of new school facilities)?

   Currently the District does need new school facilities to meet the demand of inadequately housed students.

6. Is there any other relevant information regarding significant project impacts?

   There is no other relevant information regarding project impacts.

7. Are there any assessment fees or other required or recommended mitigation measures for the project? If so, please explain.

   Consistent with the Government Code, the District does collect Developer Fees for all residential and commercial projects within the school district. These fees would be calculated and applied at the time of the construction permit approval.

Sincerely,

Dr. John Niederkorn
Director of Business

JN/sc
G:\Reports\School Facilities Questionnaire Response 6-18-02

GARY PENROD, SHERIFF

RECEIVED
JUN 2 4 2002
RBF CONSULTING

June 28, 2002

Big Bear Station
P.O. Box 2803
Big Bear Lake, CA. 92315
(909) 866-0100

Michael Harden, Environmental Analyst
R.B.F. Consulting
P.O. Box 57057
Irvine, CA. 92619-7057

SUBJECT: Moon Camp Environmental Impact Report

Dear Mr. Harden:

In response to your request on the Environmental Impact Report, we have reviewed the tentative track map for the proposed 95 lot track #16136 (Moon Camp Residential subdivision.

The Big Bear Sheriff's Station is located at 477 Summit Blvd., Big Bear Lake, CA. 92315, six miles east of the proposed project site. The station is functionally organized into two distinct groups to serve the citizens of the Big Bear Valley. The station serves as host to the City of Big Bear Lake's contract law enforcement services, personnel, as well as staff to serve the unincorporated area. Additionally, a Type I jail facility is housed within the County building. We have nine patrol deputies, twenty-four coverage assigned to unincorporated area, one detective, and support personnel.

The Big Bear Station unincorporated population is estimated at 15,800. These numbers were taken from the population estimates from the State of California demographics cities and counties as of January 1, 2001. The average response time for emergency type calls, the average response time for emergency type calls is 6.97 minutes within the jurisdiction. Total average response time in the unincorporated areas 28.59 minutes. The response types and times may vary plus or minus depending on the number of calls for service received. We handled 9,028 calls for service in the unincorporated area of Big Bear Valley from January 1, 2000 to January 1, 2001. This information was collected from the Sheriff's Crime Analysis Unit.

The anticipated impact the Department may incur as the result of this type of development are the following: Increase response to burglar alarm calls, general criminal investigations, missing or lost persons, emergency medical calls, thefts from boats, and vandalism. Also, concerns for proper road signage, street lights, residence addresses posted, snow conditions, snow removal from residential roadways, coordination with the California Highway Patrol, and CALTRANS for road closures and/or traffic accidents, private roadways within the development or will the roadways be turned over to the county for responsibility and maintenance?

Speed limits posted per the California Vehicle Code, within the residential area, and accessibility through the gated entry.

The San Bernardino County Development Code will also address issue or concerns that will affect this type of proposed project.

Should you have any questions that we may help you with, please call me at the Big Bear Sheriff's Station, (909) 866-0100.

Sincerely,

Bobby R. Phillips, Captain
Big Bear Station Commander

DAD:BRP:mj

DEPARTMENT OF WATER AND POWER

June 28, 2002

Scott Magorien
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618-2027

RE: MOON CAMP ENVIRONMENTAL IMPACT REPORT

Dear Mr. Scott Magorien:

This is in regards to water service for the proposed Moon Camp Subdivision, Tentative Tract # 16136. This particular project is located at the west boundary of the North Shore subunit, which is just east of the Grout Creek subunit that feeds the town known as Fawnskin. I will be sending Michael Harden, from your company, answers to the questions outlined in his June 6 letter.

In regards to Question # 6, that you requested information on, I offer the following:

6) In March of 2002, our consulting engineer completed a feasibility Study. The feasibility Study estimates that, upon build out, this tract would create a demand of an average of 41,400 gallons per day, and a maximum day demand of 103,500 gallons per day. The DWP's most recent Master Plan was completed in 1997, prior to this proposed development.

There are two existing wells located on this proposed site, one on the south side of the highway, and one on the north side. Combined, these wells produce approximately 150 gallons per minute. DWP can serve this project provided the two wells be fully equipped to pump 150 gallons per minute, and are turned over to the DWP to incorporate into our water system.

Big Bear Valley is currently entering its fourth year of drought; therefore, our hydrogeologist has recommended that a controlled pump test, with a duration of 24 hours be completed, in addition to a full Title 22 water quality analysis. These tests would need to be coordinated through our consultant, Dennis Williams of Geo Science.

I apologize for the delay in getting this information to you. If you have any additional questions, please contact me at (909) 866-5050.

Sincerely,

Dottie Saville

Dottie Saville
General Manager

G/CorresAdmin/MooncampERIRBF6-02

41972 Garstin Drive, P.O. Box 1929, Big Bear Lake, CA 92315-1929 (909) 866-5050 FAX (909) 866-3184

Bear Valley Electric Service

P.O. Box 1547 42020 Garstin Rd. Big Bear Lake, California 92315
A Division of Southern California Water Company

Telephone (909) 866- 4678
Fax (909) 866-5056

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July 2, 2002

RBF Consulting
Attn: Michael Harden
P.O. Box 57057
Irving CA 92619-7057

Subject: BVES response to Moon Camp EIR Request

What is the present service area and/or location of your facilities? Are any of these facilities within the proposed project boundaries as shown on the attached site vicinity map?

BVES service area covers all of the proposed project. A power line currently traverses the area in an east west direction. Some is located along the existing highway, and some away from the highway.

What is the present capacity an/or nature of your facilities? Please provide any available information necessary to evaluate existing conditions in the project area and potential impacts.

The existing line is 4160/2400 volts, and has #2 copper as its conductor. The distribution line is fed by a substation located just west of Stanfield Cutoff, which in turn is fed by a 34Kv transmission line whose source is the Goldhill switching center located near the Big Bear Dump. The transmission line has a section of #2 copper that limits its capacity. Winter loads have reached the maximum allowed on the line. Substantial load additions may cause a need for facilities to be upgraded.

What is the projected electrical demand for the project based upon the information provided.

This is unknown with the information sent. Other tracts with larger lots and houses, the diversified loading estimates have been 4 – 5 Kw per lot. If this tract is similar, there would be a substantial loading increase upon build out.

Can your facilities in the service area supply the required additional electricity currently or upon project completion?

Since the source transmission line has reached its peak, any large load addition may be difficult to serve. There would be several alternatives to look at to relieve load on the transmission. One alternative would be to shift load to another transmission line, but the other line is also operating near capacity. Another alternative would to investigate a distributed generation option.

Do you anticipate any project related impacts to your facilities? Specifically, will the proposed project impact service or require new or modified facilities? If so, please list/summarize additions or modifications?

The total length of the distribution line running through the project area will probably need to be relocated. The current overhead line, would need to be reconstructed as an underground line along the new highway right of way. From Stanfield the existing distribution feeder proceeds westerly for 2.6 miles underground, then traverses overhead. Undergrounding through this tract would leave a short section of overhead line. This overhead section would have to be investigated to determine if it would also need to be placed underground.

Do you anticipate any short term construction or related impacts, such as a possible disruption of service?

There should be very minimal impacts and disruption of service.

Is there any other relevant information regarding potential significant impacts of the project?

Tap lines to serve individual lots would be made under our tariff rule 15 and 16, Any relocation and other related cost would be paid for by the developer. The extent of relocation and other costs is unknown at this time.

Do you require or recommend any mitigation measures for any project impacts?

BVES operates under tariff rules as set by the CPUC, and mitigation would also fall under those tariff rules. Any mitigation would occur by having to maintain the existing level of service to our existing customers, while adding new load to the system. As mentioned above, a distributed generation option could be required. If this is determined, placement of a generator would need to be placed on a parcel within the development or on a parcel provided by the developers.

Please call at 909-866-4678, if you have any questions.

Mark Abraham

Mark Abraham
Engineering Supervisor

C: Roger Kropke

July 14, 2002

Mike Harden
RBF Consulting
PO Box 57057
14725 Alton Parkway
Irvine, CA 92618-2027

Subject: **Natural Gas Service, Fawnskin**
Your Project # JN 10-101901.001, Moon Camp Project

Dear Sir:

The following information is submitted per your request 7/10/2002.

1. What is the present service area and /or locations of your facilities? Are any of these facilities within the proposed project boundaries as shown on the attached Site Vicinity Map?

   Natural Gas "Main" pipelines are installed in the right-of-way of Northshore Drive aka State Hwy 38.

2. What is the present capacity and/or nature of your facilities?

   Capacity is sufficient to provide natural gas for typical residential customers.

3. Please provide estimated gas consumption factor on the basis of the information provided?

   I don't understand this question.

4. Do you anticipate any project related impacts to your facilities in the service area? List or summarize.

   No.

5. Do you anticipate any short-term construction related impacts to the service area, such as the possible disruption of service?

   No.

6. Do you require or recommend any mitigation measure for any project impacts noted above?

   No.

7. Is there any other relevant information regarding potential impacts of the project?

   No.

Please refer to the enclosed maps. Locations of the gas lines are for general reference only. Exact locations can only be determined by field locating.

A "Request to Serve" should be submitted to the SWG Sale Office at (760) 951-4018.

If you have any further questions please contact me at (760) 951-4016.

Best Regards,

Timothy E. Cook
Engineering Manager
Southern California Division
Tim.Cook@SWGas.com

TEC/cj

SOUTHWEST GAS CORPORATION

RECEIVED
JUL 2 2 2002
RBF CONSULTING

July 17, 2002

Mike Harden
RBF Consulting
PO Box 57057
14725 Alton Parkway
Irvine, CA 92618-2027

Dear Sir:

Subject: Natural Gas Service, Fawnskin /
Project # JN 10-101901.001, Moon Camp Project

The following information is submitted per your request 7/10/2002.

1. What is the present service area and /or locations of your facilities? Are any of these facilities within the proposed project boundaries as shown on the attached Site Vicinity Map?

   Natural Gas "Main" pipelines are installed in the right-of-way of Northshore Drive aka State Hwy 38.

2. What is the present capacity and/or nature of your facilities?

   Capacity is sufficient to provide natural gas for typical residential customers.

3. Please provide estimated gas consumption factor on the basis of the information provided?

   I don't understand this question.

4. Do you anticipate any project related impacts to your facilities in the service area? List or summarize.

   No.

13471 Mariposa Road / Victorville, California 92392-0919 / (760) 241-9321
P.O. Box 1498 / Victorville, California 92393-1498 / FAX: (760) 951-4081

5. Do you anticipate any short-term construction related impacts to the service area, such as the possible disruption of service?

   No.

6. Do you require or recommend any mitigation measure for any project impacts noted above?

   No.

7. Is there any other relevant information regarding potential impacts of the project?

   No.

Please refer to the enclosed maps. Locations of the gas lines are for general reference only. Exact locations can only be determined by field locating.

A "Request to Serve" should be submitted to the SWG Sale Office at (760) 951-4018.

If you have any further questions please contact me at (760) 951-4016.

Best Regards,

Timothy E. Cook
Engineering Manager
Southern California Division
tim.cook@swgas.com

TEC/jdt

So & Associates Engineers Inc.

16209 KAMANA RD., SUITE 100 • P.O. BOX 1712 • APPLE VALLEY, CA 92307 • PHONE (760) 242-2365 FAX (760) 242-3083

101.0110-114

July 26, 2001

Special Districts Department
Water & Sanitation Division
12402 Industrial Blvd., Bldg. D, Suite 6
Victorville, CA 92392

Attention: Mr. Thomas Sutton
Division Chief

Reference: **County Service Area 53, Improvement Zone B (CSA 53-B) Sewer Feasibility Study for APN # 0304-091-12,13 and 0304-082-04 (Mr. Michael Rafferty)**

Dear Mr. Sutton:

In accordance with CSA 53-B (District) authorization, SAE staff have completed the subject feasibility study for APN 0304-091-12, 13 and 0304-082-04 for connection to CSA 53-B sewer system. We are pleased to submit the final feasibility study report for District's review and acceptance. All initial review comments have been incorporated.

A. Wastewater Flow From the Proposed Development

The proposed project is a housing development located in the Northeast 1/4 of Section 13, Township 2 North and Range 1 West. The proposed project will consist of 92 single family housing lots as shown in Figure 1 and the tentative Tract map. The sewer capacity requirement for the proposed project will be determined based on equivalent dwelling units (EDUs). For this study, each subdivided lot will be considered as one EDU and average wastewater flow per EDU in the CSA 53 Fawnskin are is typically estimated at 215 gpd (gallons per day). In this case, the proposed project will be assigned a maximum occupancy of 92 EDUs with an average flow at 215 gpd/EDU x 92 = 19,780 gpd. For preliminary design purpose, a peaking factor of four will be used. The estimated peak wastewater flow immediately downstream of the proposed development will be 79,120 gpd (54.9 gallons per minute).

B. Existing Sewer System Capacity Review and Buy-In Cost

The existing sewer system located to the east of Project site should be capable of handling the wastewater flow from the proposed development based on estimated flows as discussed above. At present, no internal collection sewer system design has been presented. The Project developer

So & Associates Engineers Inc.
16209 KAMANA ROAD, SUITE 100 • APPLE VALLEY, CA 92307
(760) 242-2365 • FAX (760) 242-3083

(through its civil engineer) will be required to submit the proposed internal collection system to CSA 53B for review and approval.

County Service Area 53-B Local Sewer Connection Fee: CSA 53B has established a 2001-2002 local sewer connection fee at $1,088.59 per equivalent dwelling unit (EDU). These fees and charges were developed through a "rate study" performed by the consulting firm of Black & Veatch for all of the County Service Areas. The study included recommendations on capital funds required to construct infrastructures to ensure adequate capacity in the District's water and sewer systems. The local sewer connection fee is estimated at: 92 EDUs x $1,088.59/EDU = $100,150.28. Depending on project phasing, this fee is subject to further inflationary adjustments.

C. Estimate Cost of System Improvements

On-Site Facilities: The proposed development will be entirely responsible for all costs of internal collection sewer facilities including manholes and connection to the CSA 53-B system at location(s) approved by CSA 53B. All on-site gravity sewers must be minimum 8-inches diameter. All on-site facilities must meet CSA 53-B standards and specifications, and construction plans must be submitted for plan check and approval by District's engineer.

Off-Site Facilities: A grading plan and sewering layout plan of the proposed development were not available for this study. Referring to Figure 1, the proposed development may be able to convey part of the wastewater flow via gravity sewer to the existing Pump Station "B"; and some of the subdivided lots may require additional on-site sewage lift station(s). CSA 53-B staff and engineer will continue to monitor and upgrade the collection sewer system to ensure adequate capacity and reliable service to its customers.

D. Regional Connection Fee

Regional connection fee imposed by BBARWA (Big Bear Area Regional Wastewater Authority) for sewage treatment and disposal are presently assessed at $2,298 per equivalent dwelling unit (EDU) and an additional $100 fee for the Fawnskin area (CSA 53-B). The above connection fees are subject to adjustment each year. The exact regional connection fees for the proposed project will be reviewed at the time when application is made to connect to the CSA 53B sewer system, based on the most current project construction plans. The estimated regional connection fee is as follows:

92 EDUs at $ 2,298/EDU = $ 211,416

So & Associates Engineers Inc.
16209 KAMANA ROAD, SUITE 100 • APPLE VALLEY, CA 92307
(760) 242-2365 • FAX (760) 242-3083

E. Plan Check/Inspection Fee

The on-site and off-site sewer line and connection details must be submitted through the Special Districts Department for plan check and approval per the District rules and regulations (current plan check fee schedule). Prior to start of construction, the developer or the contractor must also deposit with the Special Districts Department the required inspection fee, again per District rules and regulations. All of the above fees are based on the proposed pipeline design footage.

F. Monthly User Fee

The monthly user fee will be determined by the CSA 53B staff at the time the sewer connection application is made (based on District's rules, regulations and the estimated number of EDUs). The current monthly user fee is $ 21.26/EDU.

G. Summary

Based on limited information provided by the developer's engineer, the following briefly summarizes the various sewering costs and connection fees:

- On-site collector sewer and lift station(s) = Developer to pay for the costs
- Off-site sewer extensions = Developer to pay for the costs
- Local Sewer Connection fees = $ 100,150.28
- Regional Connection Fee = $ 211,416

We trust that the information provided in this report will be helpful to the developer and the Special Districts Department. Information provided in this letter report is valid for a period of one year from date of the final report.

Very truly yours,

Wilson F. So, P.E.
District Engineer

FIGURE 1
COUNTY SERVICE AREA 53B
SEWER FEASIBILITY STUDY
(APN'S 0304-091,12,13 AND 0304-082-04)

DEPARTMENT OF WATER AND POWER

August 8, 2002

RECEIVED
AUG 12 2002
RBF CONSULTING

Michael Harden
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618-2027

RE: MOON CAMP ENVIRONMENTAL IMPACT REPORT

Dear Mr. Harden:

In response to your questions regarding water service for the proposed Moon Camp development I offer the following information:

1) Fawnskin is located in the Grout Creek sub-basin, which has an annual projected safe yield of 200 acre-feet. Moon Camp is located at the western boundary of the North Shore sub-basin. The North Shore sub-basin has an estimated safe yield of 260 acre-feet per year. The annual use for the Fawnskin area is 136 acre-feet, the daily flow is .5cfs, and the peak demand is .2 MGD.

2) The projected demand for the project is 72 GPM (41,400 GPD)

3) There are two existing wells on the project site. The closest DWP water mainline is located at North Shore Drive and Canyon Road. The closest Reservoir is Cline Miller, which is located north of the project site. (See attached maps for locations.)

4) Grout Creek sub-basin extracts an average of 126 acre-feet per year (41.2 million gallons). There are currently no customers in the western portion of the North Shore sub-basin, so nothing is extracted there at this time. Existing water quality is good.

5) See attached feasibility study from our engineers, So & Associates, which outlines the new facilities required.

6) See attached letter to your consultant, Scott Magorien, regarding answers to question # 6.

41972 Garstin Drive, P.O. Box 1929, Big Bear Lake, CA 92315-1929 (909) 866-5050 FAX (909) 866-3184

7) We are still checking on whether or not the proposed project is subject to Senate Bill 610 and/or 221.

8) Pending outcome of well testing, as addressed in the June 28, 2002 letter regarding water demands and existing wells.

9) Must following DWP regulations regarding limitation on landscaping and watering hours, and must use Xeriscape. Private wells should not be allowed due to limited groundwater supplies available. Current connection fees are $4,086 per residential connection (payable at the current rates when connecting to the Water System). Also, see attached letters addressing # 5 & 6 above.

I apologize for the delay in getting this information to you. If you have any additional questions please call me at (909) 866-5050 or email me at dwp@bigbear.net. Thank you!

Very truly yours,

Dottie Saville

Dottie Saville
General Manager

Enclosures

G/CorrespAdmin/MooncampEIR2nd

DEPARTMENT OF WATER AND POWER

RECEIVED
FEB 10 2003
RBF CONSULTING

January 6, 2003

Mike Harden
Environmental Analyst
RBF Consulting
P.O. Box 57057
Irvine, CA 92619-7057

RE: MOON CAMP ENVIRONMENTAL IMPACT REPORT

Dear Mr. Harden,

The following comments are in response to the questions raised in your letter dated December 11, 2002, in the order they were raised.

1. The proposed Moon Camp development is located immediately adjacent to the City of Big Bear Lake, Department of Water and Power (DWP) service area. The next closest water purveyor's (Big Bear City Community Services District) water delivery facilities is more than four miles from the site. The DWP is the only public water agency capable of supplying this project. I do not believe LAFCO would have to take any formal action to allow the DWP to serve this project.

2. The DWP Board of Commissioners is considering placing limitations on the number of new water connections within the Big Bear Lake, Moonridge, Erwin Lake, Sugarloaf, and Lake Williams service areas and has plans for addressing the issue during one or more special meetings in March and April. To date, connection limitation discussions have not focused on the Fawnskin service area.

3. This project development includes provision for two fully functional wells being added to the DWP system. Based upon our current understanding, we anticipate these wells will provide an adequate supply of water to meet the project water demands. Should the Board of Commissioners enact drought-related emergency water conservation measures, those measures would apply to the entire DWP service area, including this project.

41972 Garstin Drive, P.O. Box 1929, Big Bear Lake, CA 92315-1929 (909) 866-5050 FAX (909) 866-3184

4. This question has been addressed in Item #2 above.

5. The well testing and performance requirements detailed in our letter dated June 28, 2002, regarding the two existing wells FP-2 and FP-3, are unchanged. Should the results of the testing prove the wells are inadequate in either production capacity or quality, the developer will be required to conduct additional exploratory and construction activities to secure a supply acceptable to the DWP.

6. The DWP does not currently have a Water Master Plan that includes the Fawnskin water system.

7. See Item #6 above.

8. The conditions of approval of the Moon Camp project required by DWP are as follows, and were initially itemized in a March 13, 2002 letter from our Engineer, So & Associates Engineers, Inc.

    a. Submit water plans (on-site) for review by DWP to ensure water mains do not conflict with the BBARWA 10-inch sewer main (which will be relocated at developer's cost).

    b. Drill and/or equip two supply wells to DWP standards and dedicate these facilities and water rights to DWP.

    c. Within the proposed tract, no individual private irrigation wells will be permitted.

    d. Advance funds towards constructing new reservoir and pipeline improvements at Clinemiller (with an estimated project cost of $481,100) and dedicate these facilities to the DWP. If other parcels of land can benefit by the off-site improvements based upon review by DWP's engineer, a "reimbursement agreement" will be considered by DWP.

    e. Pay other component (except source, storage, and transmission) of the connection fee to DWP at the time of application for water service for specific subdivided parcels.

    f. Pay plan check, inspection, and water meter installation charges as discussed in this Feasibility Study Report.

g. DWP encourages low water usage landscape designs (turf limitation) to achieve water conservation. This may in turn lower the water supply demand. The developer is required to submit landscaping plans for review by the DWP that satisfy mandatory regulations pertaining to landscaping and irrigation as detailed in City of Big Bear Lake Ordinance No. 2002-323 (copy attached).

Please contact me if you have questions/comments.

Very truly yours,

Dottie Saville

DOTTIE SAVILLE
General Manager

DS:RLB

Enclosure

c: Scott Heule

From: <john_niederkorn@bigbear.k12.ca.us>
To: <mharden@rbf.com>
Date: 11/26/02 7:54AM
Subject: Mooncamp

Regarding Mooncamp's proposed development and impact on Bear Valley Unified

Bear Valley Unified is prepared to serve the projected students that might move into the proposed Mooncamp development. Our Developer Fee Justification Study, which is conducted every two years, projects that approximately 20 students would be generated by this development. Based upon current demographics, a .21 student per housing unit is the calculated student loading factor for our school district.

Bear Valley Unified is currently in year 4 of a modest enrollment decline. We would hope that we would be experiencing a modest enrollment growth instead. The development of Mooncamp would support a modest enrollment growth.

The District currently collects Developer's Fees for new construction. The current residential rate is $.82 per square foot. This rate is unique among California School Districts because it is significantly less than the State Maximum Allowable. This lesser developer fee rate is again determined by the developer fee justification study and is indicative of the modest demand placed on school district facilities due to the projected student enrollment growth projection.

John Niederkorn
Director of Business

So & Associates Engineers Inc.

16209 KAMANA RD., SUITE 200 • P.O. BOX 1712 • APPLE VALLEY, CA 92307 • PHONE (760) 242-2365 FAX (760) 242-3083

September 7, 2004

137.0020-27
(Ref. 137.0020-18)

City of Big Bear Lake
Department of Water & Power
PO BOX 1929
Big Bear Lake, CA 92315-1929

Attention: Mr. Scott Heule
Assistant General Manager

Reference: Water Feasibility Study Update for Tentative Tract 16136 (Moon Camp) (APN# 0304-091-12,13 and 0304-082-04)

Dear Mr. Heule:

In response to City of Big Bear Lake Department of Water and Power (DWP) request and authorization, our staff has completed a system review and hydraulic analysis to update the water feasibility study for Tentative Tract 16136. We are pleased to submit this Final Report for your review and approval.

A. PROJECT DESCRIPTION

The proposed project is a housing development located in the Northeast 1/4 of Section 13, Township 2 North and Range 1 West. The proposed project will consist of 92 single family housing lots as shown in Figure 1-B. Each residential lot will be considered as one equivalent dwelling unit (EDU). The average day demand (ADD) and maximum day demand (MDD), based on the number of EDUs is estimated to assess the impact to the existing water system.

Water Demand: Using information from the water production and water sales (from the 2004 3-year CIP study), the average day water demand is approximately 250 gallons per day per equivalent dwelling unit (gpd/EDU) throughout the DWP service area. The max-day demand as considered takes into consideration that water usage occurs over an 8 to 10 hour period each day.

Average day demand (ADD)	=	92 EDU x 250 gpd/EDU
	=	25.77 AF/year
Maximum day demand (MDD)	=	2.5 x ADD/1,440 minutes per day
	=	57,500 gpd (about 40 gpm)

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Fire Flow Requirements: The existing water distribution system was originally designed for about 750 gpm fire flow for two hours. The current requirement per the County Fire Department for the Fawskin area is between 1,000 gpm and 1,500 gpm depending on the building square footage. The fire flow may be further increased in the future. As such, the water distribution system was analyzed to handle the maximum day demand of the proposed development plus fire flow of 1,500 gpm.

Water Supply and Storage Requirements: The State Health Department requires storage to account for one peak day usage. The DWP typically experiences one peak day during a summer holiday when tourists and part-time residents become full-time users. The average day water demand at 250 gpd/EDU or above and corresponding max-day demand is representative of that day and is the basis for calculating the water supply and storage required for the proposed project as presented in prior discussions and shown below:

Domestic water supply requirement (Max. Day)	= 40.0	gallons per minute
Operational Storage = (0.3 x MDD)	= 17,250	gallons
Emergency Storage = (1.0 x MDD)	= 57,500	gallons
Subtotal (without fire storage)	= 74,750	gallons
Fire Storage (1,500 gpm x 2 hour)	= 180,000	gallons
Total Storage Requirement	= 255,000	gallons

Based on proposed project development requirements (at MMD), one to two new well(s) may be required to provide a minimum of 40.0 gallons per minute. Developer will be required to deposit funds with DWP for new well construction unless a proven source of supply is provided by the developer at locations satisfactory to DWP and not exceeding sub-basin safe-yields. It is our understanding that the developer is proposing to drill/equip two wells to DWP standards and dedicate these production wells to the DWP. The developer shall record a quit-claim deed to the City of Big Bear Lake, Department of Water & Power for "all rights to percolating or other groundwater underlying the subdivision." Further, within the proposed tract, no individual private irrigation wells will be permitted.

B. WATER DISTRIBUTION SYSTEM REVIEW

The proposed tract is located near the southeast side of the Fawnskin area, which receives water from Cline Miller Reservoir. Figure 1-A attached shows the existing distribution piping system near the proposed development and the recommended pipeline extension layout. Referencing the hydraulic grade line of 6,957 feet elevation at Cline Miller Reservoir and the approximate ground elevation at project site (varying from 6,780 to 6,800 feet), the minimum static pressure at the project area should be around 68 psi.

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Under maximum day demands plus residential fire flow of 1,500 gpm, the minimum residual pressure of 20 psi can be met, based on the existing computer hydraulic model. However, the existing Cline-Miller reservoir is an old 100,000 gallon concrete reservoir which will not be sufficient to serve the proposed project. The existing site has limited room for a new tank without demolishing the old tank and/or securing additional property. Therefore, it is recommended that the old concrete reservoir be replaced with a new 300,000 to 400,000 gallon storage reservoir. The developer will be required to advance funds towards construction of the new reservoir and the 12-inch transmission pipeline from the reservoir site to the proposed development (see attached map).

C. ESTIMATED COST OF SYSTEM IMPROVEMENT

On-Site Facilities: The owner or developer of Tentative Tract 16136 will be entirely responsible for all costs of internal facilities. On site distribution pipeline must be 8-inches diameter minimum. All site facilities (plumbing, piping, etc) must also meet the requirements of CBBL-DWP, and San Bernardino County Building & Safety Department.

Off-site Facilities: The property owner or developer is responsible for advancing funds towards the construction of a new reservoir (255,000 gallons minimum) at Cline-Miller and the associated 12-inch transmission pipeline. The estimated probable project costs are as follows:

• Construction of a 255,000 gallon (min.) replacement reservoir	= $135,000 *
• Construction of about 2,780 lineal feet of 12-inch pipeline	= $250,000
Subtotal	= $385,000
• Allowance for project contingency, engineering, and administration	= $115,000
• Estimated total probable project cost	= $500,000

* Adjusted for recent increases in steel construction; DWP may participate to make it a 400,000 gallon tank.

Water Supply Source: As discussed earlier, the project developer will be required to drill/equip up two new wells to meet the project's max-day demand.

Connection Fee: The proposed project is required to pay the DWP connection fee (at $ 4,942 / EDU for FY 2004-05 plus a $1,000/EDU supplemental water fee) in order to mitigate the project's impact on the existing water system. Based on the estimated 92 EDUs referenced in this report, the total project connection fee is estimated as follows:

92 EDUs X $(4,942 + 1,000)/EDU = $546,664

Because the project developer is proposing to drill/equip two wells to DWP standards, and will be

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required to advance funds towards constructing a new reservoir and off-site pipeline, credit for components of the normal connection fee (source, storage, transmission) discussed above should be discussed with DWP. Any other component of the above connection fees will be paid when the developer or new lot owner applies for residential connections and water service to the DWP system. Additional fees such as plan check, inspection, and monthly user fees are determined by the DWP at the time of application for service.

D. SUMMARY

The proposed project (Tentative Tract 16136) can be served by the Department's water system in the Fawnskin area provided that the project developer meets with the following requirements:

- Submit water plans (on-site) for review/approval by DWP to make sure that water mains do not conflict with the BBARWA 10-inch sewer force main (which will be relocated at the developer's cost).

- Drill and equip up to two new supply wells to DWP standards and dedicate those facilities and water rights to DWP. Within the proposed tract, no individual private irrigation wells will be permitted. The developer shall record a quitclaim deed to the City of Big Bear Lake, Department of Water and Power for "All rights to percolating or other groundwater underlying the subdivision."

- Advance funds towards constructing new reservoir and transmission pipeline at Cline-Miller (with an estimated project cost at $500,000) and dedicate these facilities to the Department of Water & Power. If other parcels of land can be benefited by the off-site improvements based on review by DWP's engineer, a "reimbursement agreement" will be considered by DWP. Because of prolonged drought experienced in the Big Bear area and the concern for basin wide groundwater safe-yield, the developer may elect to reduce the extent of initial development. The following table presents a summary of project costs and connection fees for initial 92 lots plus two other scenarios:

	92 lots	71 lots	50 lots
Average day water demand (gpd) Estimated annual usage in acre-ft/year	23,000 (25.77)	17,750 (19.88)	12,500 (14.00)
Estimated off-site improvement cost	< $500,000	< $500,000	< $500,000
Estimated DWP connection fee(s)	$546,664	$421,882	$297,100

- Pay other component (except source, storage, and transmission) of the connection fee to DWP at the time of application for water service for specific subdivided parcels.

- Pay plan check, inspection, and water meter installation charges as discussed in this feasibility study report.

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- DWP requires low water usage landscape designs (turf limitations and xeriscape) to achieve water use efficiency. This may in turn lower the water supply demand. The developer is required to submit landscaping plans for review with DWP.

Information provided in this letter report is valid until September 15, 2005. The above water connection fee(s) and estimated improvement costs will be subject to further inflationary adjustment depending on commencement and completion of the entire project. We trust that this information will prove useful to the Department of Water and Power and the project developer.

Very Truly Yours,

Wilson F. So., P.E.

13701040
3/20/02

CEDAR DELL RESERVOIR
1.0 MG
HGL 6957'

RACOON RIDGE RESERVOIRS
0.25 MG
HGL 7115'

CLINE MILLER RESERVOIRS
0.17 MG
HGL 6957'

SCALE: 1"=500'

LEGEND

- TENTATIVE TRACT 16136 BOUNDARY
- PROPOSED 8-INCH & 12-INCH WATER PIPELINE
- EXISTING WATER PIPELINE
- EXISTING 10" SEWER FORCE MAIN
- PRESSURE ZONE

BOUNDARY TENTATIVE
TRACT 16136

BIG BEAR LAKE

FIGURE 1
CITY OF BIG BEAR LAKE
DEPARTMENT OF WATER AND POWER
WATER FEASIBILITY STUDY
TENTATIVE TRACT 16136

A.2 - 2010 Revised and Recirculated Draft EIR No. 1 and Appendices

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VOLUME I

Draft

Revised and Recirculated

Environmental Impact Report

Moon Camp 50-Lot Residential Subdivision, TT No. 16136

(Based on the Revised Site Plan)

Big Bear Lake, San Bernardino County, CA

SCH # 2002021105

Prepared for:

County of San Bernardino
Advance Planning Division
Land Use Services Department
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

Contact: Mr. Matthew Slowik, MURP, MPA, Senior Planner

Prepared by:

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760.322.8847

Contact: Frank Coyle, Branch Manager

Michael Brandman Associates

March 25, 2010

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EXECUTIVE SUMMARY

Introduction

The County of San Bernardino is the Lead Agency under the California Environmental Quality Act (CEQA), and is responsible for preparing the Environmental Impact Report (EIR) for the Moon Camp Residential Subdivision, Tentative Tract No. 16136 project (State Clearinghouse No. 2002021105).

A Draft EIR evaluating the Original Proposed Project - a 92-lot residential subdivision with minimum 7,200-square-foot lots on 62.43 acres - was circulated for public review in 2004, and a Final EIR was prepared in 2005. The 2005 Final EIR focused primarily on changes in the environment that would result from the development of 92 residential lots along with three lettered lots to provide private streets, a 103-slip private boat marina, related infrastructure, and the realignment of State Route 38 (SR-38) that would allow the development of 31 lakefront residential lots. The 2005 Final EIR identified potential impacts that could result from the construction and operation of the Original Proposed Project and provided measures to mitigate potentially significant impacts. However, even after the implementation of all feasible mitigation measures, there were a number of impacts associated with the Original Proposed Project that would remain significant and unavoidable. These are impacts related to Aesthetics (loss of views of the lake and surrounding mountains due to the development of the 31 lakefront lots), Air Quality (short-term during construction and long-term), Biological Resources (noise and perch tree impacts on the bald eagle), and Water Supply (inconclusive groundwater supply). Note: this issue was addressed in both the Hydrology/Water Quality and Public Services/Utilities sections of the 2004 and 2005 Final EIR).

Subsequent to circulation of the 2005 Final EIR, the Applicant revised the project design/description. The revised project design/description (Proposed Alternative Project) is the subdivision of the 62.43-acre site into 50 numbered lots (residential lots) and seven lettered lots. The 50 residential lots would have a minimum lot size of 20,000 square feet and be sold individually and developed into individual custom homes. There is no realignment of SR-38 and there are no lakefront residential lots. All 50 residential lots are to the north (above) SR-38. Of the seven lettered lots, one would be designated as Pebble Plain Habitat and Open Space/Conservation (4.91 acres), one would be designated as Open Space/Neighborhood Lake Access (0.82 acre with 891 lineal feet of lakefront access), one would be developed as the marina parking lot with a boat ramp for a 55-slip private boat marina (2.90 acres), three are the existing well sites, and one is a potential reservoir site. The marina parking lot also includes some open space for the preservation of existing trees and eagle perch trees; however, because of the development of the parking lot and boat ramp, the lot would not be considered Open Space. A 10-acre off-site pebble plain habitat will also be purchased and dedicated as a Conservation Easement.

As a result of the revised design/description, the Proposed Alternative Project has eliminated the significant and unavoidable impacts associated with Aesthetics, Air Quality and Water Supply. The

unavoidable impact remaining is Biological Resources – noise and perch tree impacts to the bald eagle.

Table ES-1, Comparison between the Original Proposed Project and Proposed Alternative Project, shows the changes between the two projects.

Table ES-1: Comparison - Original Proposed Project and Proposed Alternative Project

	Original Proposed Project	Proposed Alternative Project	Change
Site Size	62.43 acres	62.43 acres	No change
Proposed General Plan Designation*	BV/RS-1 (residential- minimum 7,200 sf lots)	BV/RS-20M (residential- minimum 20,000 sf lots)	Approx. 6 du/ac to approx 2 du/ac
Number of Lots	95	57	- 38
Residential Lots	92	50	- 42
Lettered Lots	3	7	+ 4
	Lot A – proposed private street designed to provide access to the southernmost lots (lakefront sites)	Lot A – a 4.91-acre Open Space/Conservation (OS/C) easement to preserve pebble plain habitat and eagle perch trees	4.91 acres of Open Space for habitat conservation and eagle perch trees
	Lot B – a 1.4-acre strip of land between State Route 38 and the private street south of the highway	Lot B – a 0.82 acre/891 lineal feet strip of land to remain OS/C between State Route 38 and the lakefront for open space and Neighborhood Lake Access	0.82 acre/891 lineal feet of Open Space for preservation of lake views, eagle perch trees and Neighborhood Lake Access
	Lot C – a gated entrance, south of State Route 38, a parking lot and access to the marina	Lot C – a 2.90-acre strip of land to be used as a parking lot and boat launch and open space	Open space, eagle perch trees and lake views are maintained
		Lots D, E and F – well sites	
		Lot G – reservoir site	Potential reservoir site
Common Areas	Common areas within lettered lots would be maintained by a homeowner's association	Conservation Easements would be maintained by a Conservation Group and Common areas within lettered lots would be maintained by a homeowner's association	A Conservation Group would maintain the Conservation Easements
Marina/Boat Dock	103 boat slips on west side of the site	55 boat slips on the east side of the site	- 48 and relocation
Lakefront Lots	31 lakefront lots	No lakefront lots	- 31 lakefront lots
State Route 38	Realignment of State Route 38 to provide a straighter alignment and to provided lakefront residential lots	No change in the alignment of State Route 38	No realignment No lakefront lots

Table ES 1 (cont.): Comparison - Original Proposed Project and Proposed Alternative Project

	Original Proposed Project	Proposed Alternative Project	Change
Development Scenario	Lots would be sold individually and custom homes would be constructed by the individual property owners	Lots would be sold individually and custom homes would be constructed by the individual property owners	No change
* Current General Plan Designation is BV/RL-40 – Bear Valley Community Plan, Rural Living, minimum 40-acre residential lot size.			

The County of San Bernardino (County) has prepared this Revised and Recirculated Draft EIR to provide responsible and trustee agencies, interested parties, and the public with information about the potential environmental effects associated with the Revised Moon Camp 50-lot Residential Subdivision Project (Proposed Alternative Project) on 62.43 acres located in the Community of Fawnskin in San Bernardino County, California.

Purpose and Use of this Revised and Recirculated Draft EIR

A Draft EIR evaluating the Original Proposed Project - a 92-lot residential subdivision - was circulated for public review in 2004 and a Final EIR was prepared in 2005. Subsequent to the circulation of the 2004 Draft EIR and 2005 Final EIR, and partially in response to public comments received on the document, the Applicant revised the tentative tract map. As discussed in detail in this Revised and Recirculated Draft EIR, the Applicant has proposed an alternative (Proposed Alternative Project) to the 2004/2005 Original Proposed Project that substantially reduces and in some cases completely avoids the significant environmental impacts that were identified in the 2005 Final EIR. Although this Proposed Alternative Project is environmentally superior to the Original Proposed Project analyzed in the 2005 Final EIR, due to the scope of the project revisions and alterations, the County, as CEQA Lead Agency, decided to prepare this Revised and Recirculated Draft EIR to fully disclose and analyze the potential environmental impacts of this alternative. Additionally, recirculation of this EIR will further the basic purpose of CEQA to inform decision makers and the public about the potential significant environmental effects of proposed activities.

CEQA requires the preparation of an objective, full disclosure document to inform agency decision makers and the general public of the direct and indirect environmental effects of the proposed action; provide mitigation measures to greatly reduce or eliminate significant adverse effects; and identify and evaluate reasonable project alternatives that could avoid or substantially lessen one or more of such effects to the proposed project. The subject of this Revised and Recirculated Draft EIR is such a project alternative.

This Revised and Recirculated Draft EIR evaluates the potential environmental effects of the Proposed Alternative Project to the degree of specificity appropriate to the current proposed actions, as required by Section 15146 of the State CEQA Guidelines. The analysis considers the actions associated with the Proposed Alternative Project to determine the short-term and long-term effects of their implementation. This Revised and Recirculated EIR discusses both the direct and indirect impacts of this alternative, as well as the cumulative impacts associated with other past, present, and reasonably foreseeable future projects. The severity of these impacts are compared to those identified for the Original Proposed Project in the 2005 Final EIR. This Revised and Recirculated EIR also provides a comparison of the Proposed Alternative Project to the Original Proposed Project and to the project alternatives evaluated in the 2005 Final EIR.

This Revised and Recirculated Draft EIR will be circulated for public review for a period of 45 days. Upon completion of the public review period, comments received on this Revised and Recirculated Draft EIR will be considered and responses will be prepared. These comments and responses will be compiled into the Final EIR for the project. The Final EIR will consist of the 2005 Final EIR, the 2010 Revised and Recirculated Draft EIR, comments on and responses to the 2010 Revised and Recirculated Draft EIR, and the Mitigation Monitoring and Reporting Program (MMRP). The Final EIR will be compiled and submitted to the Planning Commission and Board of Supervisors for their review and consideration of the Proposed Alternative Project.

Project Overview

The following information summarizes the Proposed Alternative Project and the relationship between the Original Proposed Project and the Proposed Alternative Project that is the subject of this Revised and Recirculated Draft EIR.

Local and Regional Setting

The approximately 62.43-acre Moon Camp project site is located on the north shore of Big Bear Lake, in the unincorporated community of Fawnskin, County of San Bernardino. Exhibit 2-1, Regional Location, and Exhibit 2-2, Local Vicinity, in Section 2, Project Description, shows the location of the project site. The Big Bear Lake area is primarily a resort community where two thirds of the residences are second homes. The south shore contains commercial and recreational facilities, including ski areas, hotels and restaurants within the incorporated City of Big Bear Lake. By comparison, the north shore area, in the vicinity of the project site, is less populated and primarily residential, with a small commercial component westerly of the project site.

SR-38, also known as North Shore Drive, provides access to the project site; the road actually transects the property. The project site is roughly bounded to the north by Flicker Road, to the south by Big Bear Lake, to the east by Polique Canyon Road, and to the west by Canyon Road. In the Township and Range nomenclature system, the project site is described as in the northern half of

Section 13, Township 2 North, Range 1 West, San Bernardino Base Meridian. San Bernardino County parcel numbers for the site include APN numbers 0304-082-04, 0304-091-12, 0304-091-22, and 0304-091-21.

Surrounding Land Uses

The project site is currently undeveloped and is designated in the County of San Bernardino, Bear Valley Community Plan (BV) as Rural Living with minimum 40-acre lots (BV/RL-40). The RL-40 land use designation allows development at a density of one dwelling unit per 40 acres and indicates that future development proposals will be considered based upon a demonstrated ability to provide adequate infrastructure and maintain consistency with the goals and policies of the Bear Valley Community Plan. Table ES-2, Existing Land Use and Land Use Zoning Districts, identifies the land use category of the site and surrounding properties, as well as the current land use designations.

Table ES-2: Existing Land Use and Land Use Zoning District

Existing Land Use		Official Land Use Zoning District (Bear Valley Community Plan)
Project Site	Vacant	Rural Living (BV/RL-40). This district provides sites for open space and recreational activities, single-family homes on very large parcels and similar and compatible uses. Minimum parcel size is 40 acres; 1 dwelling unit per parcel. This is considered a holding zone designation in the Bear Valley Community Plan, which indicates that future General Plan amendments will be considered where specific development proposals demonstrate an ability to provide adequate infrastructure to serve the development and maintain consistency with the goals and policies of the Bear Valley Community Plan.
North	Residential (N and NW), Forest (N and NE)	Residential (BV/RS). 1 dwelling unit per 0.25 acre and a minimum lot size of 7,200 square feet. US Forest Service administered land.
South	Big Bear Lake, Residential (SE)	Floodway (FW). Uses permitted at owners risk; minimum parcel size is 10 acres. Single Residential (BV/RS). 4 dwelling units per acre, minimum lot size is 7,200 square feet.
East	Residential (SE) Forest (N and NE)	Single Residential (BV/RS). 1 dwelling unit per 0.25 acre and a minimum lot size of 7,200 square feet. Resource Conservation (BV/RC). Minimum parcel size is 40 acres; 1 dwelling unit per parcel. US Forest Service administered land.
West	Vacant, Residential (SW) Residential (W)	Special Development (BV/SD-RES). Minimum parcel size 40 acres. This District provides sites for a combination of residential uses. Single Residential (BV/RS). 4 dwelling units per acre, minimum lot size is 7,200 square feet.
Sources: Bear Valley Community Plan, 2007. County of San Bernardino Development Code, 2007.		

Project (Proposed Alternative Project) Characteristics

The Proposed Alternative Project is the subdivision of the 62.43-acre site into 50 numbered lots (residential lots) to be sold individually and developed into custom homes and seven lettered lots, of which one would be designated as Open Space/Conservation, one would be Open Space/Neighborhood Lake Access, one would be developed as the marina parking lot with a boat ramp, three are the existing well sites, and the seventh is a potential reservoir site. The marina lot also includes some open space for the preservation of existing trees/perch trees; however, because of the development of the parking lot and boat ramp, the lot would not be considered Open Space. Table ES-1, Comparison – Original Proposed Project and Proposed Alternative Project, compares the features/changes of the Proposed Alternative Project to the Original Proposed Project. The following narrative outlines the revisions to the project description as a result of the Proposed Alternative Project.

- The Tentative Tract Map has been revised to reduce the number of lots from 95 lots to 57 lots by: 1) proposing larger lot sizes (minimum 20,000-square-foot lots – BV/RS-20M vs. BV/RS-1 residential – minimum 7,200 sf lots in the Original Proposed Project); 2) eliminating all residential development along the shoreline (a reduction of 31 lakefront lots); and 3) creating two distinct conservation areas – one covering a portion of the shoreline south of SR-38 and also providing Neighborhood Lake Access, and the other encompassing the pebble plain habitat and bald eagle perches on the west end of the site. A third lettered lot consists of the marina parking lot/boat launch ramp, which also includes some open space, but because of the proposed use, cannot be referred to as Open Space/Conservation. Finally, there are three lettered lots for the existing water well sites and one lettered lot for the potential reservoir site. As noted above, a 10-acre off-site pebble plain habitat would be purchased and dedicated as a Conservation Easement.
- The Applicant's request for a General Plan Amendment was revised to reflect the larger minimum lot size and to re-designate the site from BV/RL-40 (minimum lot size 40 acres) to BV/RS-20M (minimum lots size 20,000 square feet) instead of the Original Proposed Project's BV/RS (minimum lot size 7,200 square feet).
- The proposed private marina has been moved from the lake shore near the west side of the site to the east side of the site, and the size of the marina has been reduced from 103 slips down to 55 slips, to reflect the proposed reduction in the number of residential lots to be developed. For the proposed marina parking lot, direct access from SR-38 is required, whereas on the original Site Plan, access to the marina parking lot was from private street A.
- The realignment of a segment of SR-38 was deleted from the Proposed Alternative Project and no changes in the SR-38 configuration are now proposed. Because the State Route segment would not be realigned, the proposed removal of approximately 665 trees of the 2,760 trees identified on site would not occur. The incidence of tree removal to develop lots would also be

reduced because of the reduction in the number of lots from 92 to 50 and the larger lot sizes would allow homebuilders greater options in siting the homes to avoid trees.

- No direct access to SR-38 from any of the 50 individual lots is proposed. Access to individual lots would be from the proposed public streets (A and B). Also, with the deletion of 31 lakefront residential lots south of SR-38, the need for five points of ingress/egress from the south side has been reduced to two to allow traffic flow through the marina parking lot (refer to Exhibits 2-3 and 2-4 in Section 2, Project Description). Residents' access from the project site north of SR-38 has been reduced from three streets to two, with the third street shown on the original site plan now proposed to be used for emergency access only.

- Water service to the project site would occur via one of three possible water service alternatives.

    - Under Alternative #1, in order for the DWP to provide water service to the project site and to own and operate the Proposed Alternative Project's water system, LAFCO would have to approve an expansion of the City of Big Bear Lake's Sphere of Influence to include the entire existing DWP Water Service Area in Fawnskin as well as the entire project site. The developer would be required to construct the on-site and off-site facilities as described in the DWP Water Feasibility Study (Alda, 2007). Significant transmission improvements in the Fawnskin system would be needed to provide fire flow to the project site. Individual pressure regulators would be required for all lots with static pressures exceeding 80 psi. The three existing on-site groundwater wells would be deeded to the DWP at the time the tract map is recorded. Two of the three wells would provide the necessary water supply for the 50 lots. For expanding the existing Fawnskin Water System infrastructure, the Applicant would install all common infrastructures, including fire hydrants, and would also install the water main lines within the project site. The water improvements will primarily occur within existing paved roads.
    - Water Service Alternative #2 would not require LAFCO's approval and would not create the expansion of the City's Sphere of Influence around Fawnskin and the project site. Instead, County Service Area 53C (CSA 53C) would own and operate the water facilities within the project site including the two onsite water supply wells and contract with the DWP for a water interconnection to the existing Fawnskin water system. The developer would be required to construct the same on-site and off-site facilities as described in the DWP's Water Feasibility Study (Alda, 2007). The water improvements for Water Service Alternative #2 would primarily occur within existing paved roads.
    - Under Water Service Alternative #3, instead of constructing the off-site water facilities (within the Fawnskin Water System), the Proposed Alternative Project's developer would construct an on-site reservoir (238,600 gallons) and an on-site booster station capable of providing the daily water supply flow and the required 1,750 gallons per

minute fire flow. Water Service Alternative #3 would not require LAFCO's approval and would not create the expansion of the City's Sphere of Influence around Fawnskin and the project site. The developer would also construct the same on-site (within the project site) water facilities (water main lines, fire hydrants, etc) identified in the Alda Water Feasibility Study. Existing water wells FP2 and FP4 would be connected to the on-site water system and pump their water into the 238,600 gallon on-site reservoir. The on-site booster station would include an emergency electrical generator to allow the station to operate during a power outage. The water improvements for Water Service Alternative #3 would primarily occur within the Proposed Alternative Project's paved roads and at the Proposed Alternative Project's reservoir site. The construction of the reservoir would include grading an approximately 75-foot-diameter pad for the reservoir. CSA 53C would own and operate this independent water system.

Findings of the 2005 Final EIR

This section provides a summary of the impacts of the Original Proposed Project, which was evaluated in the 2005 Final EIR.

Findings of No Impact

The 2005 Final EIR included an Initial Study used to identify potential impacts that should be evaluated in the EIR and areas where no impacts would occur. Areas where no impact would occur are as follows:

Agricultural Resources

The project site is not known to contain soils that have been designated as prime or unique agricultural soils and agricultural activities have not historically occurred at the project site. The project would not adversely impact prime or locally important agriculture, as none occurs within the project area. The entire site is zoned residential and is not under a Williamson Act contract.

Hazards and Hazardous Materials

With regard to transport of hazardous materials, as a residential subdivision, the project would not include the transport of hazardous materials. The private marina would include boat slips in a floating dock that is not considered to be an "improved marina." That is, there would be no storage of fuels or other such hazardous materials on-site. The project site is also not identified as a hazardous waste site by the County or State.

With regard to proximity to an airport or airstrip, the site is not located within an airport land use plan and the nearest airport is 3.5 miles to the east.

Land Use

The proposed project would not physically divide an established community but would be an infill project within the Fawnskin Community.

Noise

Again, with regard to proximity to an airport or airstrip, the site is not located within an airport land use plan and the nearest airport is 3.5 miles to the east. Therefore, airport related noise is not an issue.

Mineral Resources

The project site is not within an area designated by the State for locally important mineral resources and it does not lie within the County of San Bernardino's Mineral Resource Zone. The San Bernardino Mountains, however, are rich in mineral resources; known occurrences include gold, silver, lead, zinc, iron, manganese, and tungsten. Claims have been operated extensively but most have been non-productive for at least 20 years. Just north of the project site is Holcomb Valley where William F. Holcomb discovered placer gold in May 1860. The mapped placer gold area begins approximately 1.5 miles north of the project site's northeastern boundary and the nearest placer gold claim (Wayne Placers) is located in Section 8, approximately 1 mile to the northeast. One-half mile to the northeast is a site (Polique Canyon) identified as metal prospect or nonmetallic deposit, which has not been operated. All other mapped claims, mines and quarries are further to the north of the project site (Geology of San Bernardino Mountains North of Big Bear Lake, California pp 51-67). No impacts to mineral resources would occur as a result of the project's implementation.

Population and Housing

The project site is currently vacant, so development of the site with a residential subdivision would not displace existing residents or cause the need to construct replacement housing.

Transportation/Traffic

With regard to the provision of adequate parking, future homebuilders would be required to provide garage space for a minimum of two cars and provide two guest parking spaces in the driveway, per the County's Development Code.

Findings of Less Than Significant Impact

The 2005 Final EIR evaluated a range of environmental issues and concluded that the following potential impacts were less than significant and did not require mitigation:

Land Use

The proposed project conflicts with the land use plan, policies and regulations set forth in the San Bernardino County General Plan and Development Code. Analysis has concluded that impacts would be less than significant with approval of a Land Use District Change and Circulation Element Amendment (Transportation/Circulation Maps). However, because the Proposed Alternative Project

also includes a request for a general plan amendment, Land Use is evaluated in this Revised and Recirculated Draft EIR.

Recreation

Implementation of the proposed project involves the construction of recreational facilities that may have an adverse physical effect on the environment. Compliance with the Big Bear MWD standards and permit requirements would reduce impacts to a less than significant level.

Public Services

Police Protection

Project implementation could result in significant impacts with respect to police protection. Although police protection services would need to be increased as a result of the project, it is anticipated that project implementation would not require any new police facilities or the alteration of existing facilities to maintain acceptable performance objectives. The project's increase in demand for police services would be offset through project-related fees and taxes. Thus, impacts would be less than significant in this regard and no mitigation measures are recommended.

Schools

Project implementation could result in significant impacts to existing school facilities. Development of the proposed project (92 residential lots) could generate a student population increase of approximately 20 students. The District collects Developer's Fees for new construction as determined by a Developer Justification Study commissioned by the District every two years. The District has stated that it could serve the projected number of students that would be generated from the proposed project, because it has been experiencing a decline in enrollment. Thus, payment of the required Developer Fees in accordance with the latest Developer Justification Study would reduce impacts to less than significant levels and no mitigation measures are recommended.

Libraries

Implementation of the proposed project would increase the population of the service area for the Big Bear Branch Library and would impact the size and services of the library facility. The increase in population would necessitate a proportionate increase in staffing, resources and materials. The increased demand is also anticipated to create a nominal demand for additional library space at existing library facilities. Funding to improve and/or increase library facilities and resources occurs by two methods. One source of revenue is based on a resolution established by the San Bernardino County Board of Supervisors that provides a tax rate of one and one-half cents per $100 of assessed valuation of property in the community. Second, libraries can receive funding from public libraries fund(s), administered by the State of California. Funding received from property taxes and/or State funds would reduce impacts to a less than significant level.

Utilities

Solid Waste

Development of the project area would result in increased solid waste generation. Project compliance with the Integrated Waste Management Plan (WMP) for the County of San Bernardino would reduce the amount of solid waste, which is ultimately disposed of at the Barstow Landfill and maintain potential impacts at a less than significant level.

Natural Gas

The Southwest Gas Corporation has indicated that natural gas "main" pipelines are installed in the right-of-way of SR-38 and that there is sufficient capacity in their facilities to provide natural gas service to the project area without any significant impact on the environment. As such, extensions to existing facilities within the interior tract roadways would be required in order to provide service to the proposed development. Service would be provided in accordance with the Southwest Gas Corporation's policies and extension rules on file with the California Public Utilities Commission. Future natural gas service to the project area would require coordination with the Gas Company's engineering department for a comprehensive plan as to levels of service required. Implementation of the proposed project would result in a less than significant impact with respect to natural gas service and no mitigation measures are required.

Electrical Service

An increased demand for electrical service would occur at the project site as a result of the proposed development. According to Bear Valley Electric Service (BVES), it is anticipated that there would be a substantial loading increase upon build-out of the proposed project (92 residential lots). BVES anticipates that impacts related to short-term construction, such as possible disruption of service, would be minimal. Additionally, tap lines to serve individual lots would be made under BVES' tariff rules 15 and 16. Any relocation or addition of new electrical facilities and other related costs would be funded by the Applicant. Since, BVES operates under tariff rules set by the CPUC, all Project-related costs would also fall under those tariff rules. All costs would be incurred by having to maintain the existing level of service to existing BVES customers, while adding new load to the system. As mentioned above, a new distributed generation option could be required. If this is determined, placement of a generator would need to be placed on a parcel within the development or on a parcel provided by the developers.

Electrical service would potentially be impacted by the proposed project and new facilities would be required. However, the Project Applicant would be required to pay all costs/fees for the expansion of existing facilities and/or construction of new facilities to maintain the existing level of service to existing BVES customers, while adding new load to the system. Payment of BVES fees/costs would mitigate all potential impacts to less than significant levels in this regard and no mitigation measures are required.

Findings of Impacts That Can Be Mitigated to Less Than Significant

The 2005 Final EIR evaluated a range of environmental issues and concluded that a number of potentially significant impacts could be reduced to less than significant levels with implementation of mitigation measures. These impacts and measures are summarized here. For a complete summary, see the 2005 Final EIR Section 2.0, Executive Summary. This document is included on a CD at the end of this Revised and Recirculated Draft EIR.

Aesthetics/Light and Glare

Light and Glare. The proposed project would introduce additional light and glare on-site, which may affect the surrounding residents. The analysis concluded that potential impacts would be reduced to less than significant levels with implementation of the recommended mitigation measures, including the requirement that all exterior lighting must be designed and located to avoid intrusive effects on adjacent residential properties and undeveloped areas adjacent to the project site. Low-intensity street lighting and low-intensity exterior lighting must be used throughout the development to the extent feasible. Lighting fixtures must use shielding, if necessary to prevent spill lighting on adjacent off site uses.

Biological Resources

Sensitive Species. Project implementation would affect species identified as special status. Implementation of recommended mitigation measures would reduce impacts to less than significant levels with the exception of the bald eagle population. Impacts to this species were considered to be significant and unavoidable due to short-term construction noise and long-term residential noise, as well as the removal of potential perch trees, particularly in the westerly portion of the project site.

Jurisdictional Waters. The proposed project would impact portions of the project site that are habitat for referenced sensitive species. Implementation of recommended mitigation measures for compensation with the creation and/or restoration of in-kind habitat on-site and/or off-site at a minimum 3:1 replacement-to-impact ratio would reduce impacts to a less than significant level. Additional requirements may be required through the permitting process, depending on the quality of habitat impacted, project design, and other factors.

Cultural Resources

The proposed project may cause a significant impact to unknown archaeological and/or historic resources on-site and to unknown paleontological resources. Implementation of recommended mitigation measures to have a monitor present on-site during grading and excavation would reduce impacts to a less than significant level. Likewise, in the event human remains are discovered during grading/ construction activities, work shall cease in the immediate area of the discovery and the Project Applicant shall comply with the requirements and procedures set forth in Section 5097.98 of the Public Resources Code (PRC), including notification of the County Coroner, notification of the

Native American Heritage Commission (NAHC), and consultation with the individual identified by the NAHC to be the "most likely descendent."

Geology and Soils

Due to site topography, development of the proposed project could result in slope failures. Development of the proposed project could also result in accelerated soil erosion, particularly during grading for building pads. The proposed project would increase the number of people/structures exposed to effects associated with seismically induced ground shaking, and during a seismic event, may be exposed to seiching of the lake. Portions of the site also contain expansive soils. Adherence to County Development Code requirements and Uniform Building Codes for development of individual sites and structures would reduce impacts to less than significant levels.

Hydrology and Water Quality

The proposed project would significantly alter drainage patterns that could result in increased erosion potential and runoff. Impacts were found to be less than significant with implementation of the project design features (i.e., the provision of adequate outlet structures, storm drains to contain flows, and proper bluff drainage). Grading, excavation, and construction activities associated with the proposed project could impact water quality due to sheet erosion of exposed soils and subsequent deposition of particles and pollutants in drainage areas. Finally, project development could result in long-term impacts to the quality of storm water and urban runoff, subsequently impacting water quality. Impacts would be reduced to less than significant levels with incorporation of the recommended mitigation measures, along with State and County Development Code requirements for implementation of Best Management Practices (BMPs) for flood control and stormwater pollution prevention during construction activities and on-going during operation.

Noise

Implementation of the proposed project would result in on-site noise associated with residential and parking lot activities and boat loading/unloading activities at the marina. The analysis concluded that stationary source impacts would be reduced to less than significant levels with adherence to the County of San Bernardino General Plan policies relating to noise level standards and recommended mitigation measures.

Implementation of the proposed project would result in increased watercraft activities on Big Bear Lake. The analysis concluded that watercraft noise impacts would be reduced to less than significant levels with adherence to Rules and Regulations established by the Big Bear Municipal Water District for Big Bear Lake.

Public Services

Fire Protection

Project implementation could result in significant impacts with respect to fire protection. Analysis has concluded that impacts would be less than significant with the recommended mitigation measures. These include such measures as adherence to the County Fire Department's fire flow requirements, including sprinklering residences and implementation of a Fuels Management Plan (FMP) approved by the County Fire Department and Forest Service. The FMP would implement the fire safety requirements of the FS1 Fire Safety Overlay District, including a minimum setback requirement from the National Forest. In addition, any cul-de-sacs developed within the project site may not be longer than 350 feet. Finally, a Homeowner's Association or a Special District must be established to implement the FMP in common areas.

Wastewater

Project implementation would generate additional wastewater beyond current conditions. Mitigation includes the funding of all on-site and off-site sewer improvements by the Applicant, to the satisfaction of the County Service Area 53 and BBARWA, which may include replacement of existing sewer lines rather than construction of parallel lines. In addition, prior to issuance of building permits, the Applicant must provide evidence to the County of San Bernardino that County Service Area 53B and BBARWA have sufficient transmission and treatment plant capacity to accept sewage flows from the project site. The Applicant must also relocate the BBARWA 10-inch force main by installing new pipe (and/or bonding for the relocation) so that it is aligned within the south shoulder of the relocated SR-38. Finally, the Applicant shall install air release valves and vaults at high elevation points on the new force main to minimize odors. Air release valves shall be large enough to enclose 55-gallon drum carbon filters to control odors.

Recreation

Public Access. Implementation of the proposed project would not affect public access along the north shore of Big Bear Lake. However, in order to provide continuity of the bike trail in the area, the Applicant must dedicate an easement along the south side of SR-38 for the trail/path.

Transportation/Traffic

Traffic Volumes/Congestion. The intersection of Stanfield Cutoff and Big Bear Boulevard operated at above 100 percent utilization in the peak month weekday evening peak hour, during traffic counts taken in 2004. Although the project would not generate significant traffic volumes, it would contribute to the intersection utilization at the weekday evening peak hour. Year 2006 (Opening Year {at that time} for the proposed project) traffic conditions would result in an increase in traffic volumes as would the General Plan buildout year of 2025. The analysis concluded that implementation of recommended mitigation measures would reduce impacts to the intersection of Stanfield Cutoff/Big Bear Boulevard, and Stanfield Cutoff/SR-38 to a less than significant level.

Traffic Hazards. Project implementation could increase hazards to vehicles, pedestrians and bicyclists due to increased traffic and the addition of eight new intersections on SR-38. The analysis concluded that with implementation of the recommended mitigation measures, impacts would be less than significant. These include restricting parking along the shoulder of SR-38, constructing turn pockets, and installing stop signs at all intersections with the highway, and limiting landscaping to increase visibility at project intersections with the highway.

Findings of Impacts That Can Not Be Mitigated to Less Than Significant Levels

The 2005 Final EIR identified potential impacts that could result from the construction and operation of the original proposed Project and that would remain significant and unavoidable after implementation of all feasible mitigation measures. These are as follows:

Aesthetics/Light and Glare

Significant and unavoidable impacts related to Aesthetics/Light and Glare were identified for viewshed alterations involving existing residents to the north, east and west of the project site. Additionally, significant and unavoidable impacts were identified for views from SR-38, a scenic highway, to the south, and from the south shore of Big Bear Lake.

Air Quality

Air quality impacts that would remain significant and unavoidable following mitigation were:

- Construction Activities: Reactive organic gases (ROG) and oxides of nitrogen (NO_x) emissions during site preparation and construction from equipment and vehicles would be significant in the short-term; and

- Project Operations: Long-term use of the project site would result in an overall increase in the local and regional pollutant load due to direct impacts from vehicle emissions, and indirect impacts from electricity and natural gas consumption. Combined mobile and area source emissions would exceed South Coast Air Quality Management District (SCAQMD) thresholds of ROG, carbon monoxide (CO) and suspended particulate matter that is 10 microns or less in diameter (PM_{10}).

Biological Resources

Project implementation would affect species identified as special status. Implementation of recommended mitigation measures would reduce impacts to less than significant levels with the exception of the bald eagle population. Impacts to this species were considered to be significant and unavoidable due to short-term construction noise and long-term noise residential noise, as well as the removal of potential perch trees.

Hydrology and Drainage

Due to potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit, project and cumulative impacts were considered to be significant and unavoidable.

Public Services and Utilities

Due to the inability of water providers to confirm service to the project, the proposed project was considered to be significant and unavoidable. This conclusion was further supported by the significant and unavoidable conclusion cited in 2005 Final EIR Section 5.11, Hydrology and Drainage, due to potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit.

Executive Summary of this Revised and Recirculated Draft EIR

Public Meeting on the Revised Project Description (Proposed Alternative Project)

Public agencies and members of the public made substantive comments on the 2004 Draft EIR. Following the 45-day period for circulation and public review, the County and its consultants along with the Applicant reviewed the comments and determined that substantial revisions to the Original Proposed Project would be required to adequately address many of the comments received. The Applicant has redesigned the project, substantially reducing the density and intensity of the proposed uses; deleted the realignment of SR-38 through the site; added Open Space/Conservation areas; and deleted all residential lots along the lakefront. This redesigned project (Proposed Alternative Project) is an Alternative to the Original Proposed Project that was considered in the 2004 Draft EIR and 2005 Final EIR. Table ES-1 contains a comprehensive comparison between the Original Proposed Project and the Proposed Alternative Project.

Due to the amount of time between the public review of the 2004 Draft EIR and the substantial revisions included in the Proposed Alternative Project, the County provided an opportunity for the public to review the revised plans and provide comment on the Proposed Alternative Project. The forum was a local community meeting held on March 31, 2007. Prior to the meeting, a Notice of Community Meeting was published in the local newspaper and mailed to Responsible Agencies, nearby homeowners, and other interested parties.

The Community Meeting was held at 10:00 a.m. at North Shore Elementary School, located at 765 North Stanfield Cutoff, Big Bear Lake, approximately 2 miles from the project site. Questions, comments, and concerns regarding the following issue areas were raised during the meeting and are addressed in this Revised and Recirculated Draft EIR.

Air Quality

See Section 4.2 of this Revised and Recirculated Draft EIR.

Water Quality

See Section 4.4 of this Revised and Recirculated Draft EIR.

Water Supply

See Section 4.7 of this Revised and Recirculated Draft EIR.

Geology/Soils

Geology and soils were found to be adequately addressed in the 2005 Final EIR.

Biology

See Section 4.3 of this Revised and Recirculated Draft EIR.

Land Use and Related Issues

See Section 4.5 of this Revised and Recirculated Draft EIR.

Infrastructure/Public Utilities/Public Services

See Sections 4.4, 4.7, and 4.9 of this Revised and Recirculated Draft EIR.

Public Safety

See Sections 4.7 and 4.9 of this Revised and Recirculated Draft EIR.

Project Development

See Section 2 of this Revised and Recirculated Draft EIR.

Issues Addressed in this Revised and Recirculated Draft EIR

The following issues are addressed in this Revised and Recirculated Draft EIR:

- Issues with Impacts that Remained Significant After Mitigation in the 2005 Final EIR:
  - Aesthetics;
  - Air Quality;
  - Biological Resources;
  - Hydrology and Water Quality (Groundwater); and
  - Public Utilities/Infrastructure (Water Supply).
- Issues that were Evaluated Based on Additional Comments Received in the Public Meeting:
  - Land Use;
  - Noise;
  - Public Services;
  - Transportation and Traffic; and
  - Utilities and Infrastructure.

Table ES-3, Executive Summary Matrix, provides a summary of the Proposed Alternative Project's environmental impacts, mitigation measures and the level of significance after implementation of mitigation.

Alternatives to the Original Proposed Project

In accordance with CEQA Guidelines Section 15126.6, Section 7 of the 2004 Draft EIR describes a range of reasonable alternatives to the Original Proposed Project that could feasibly attain the basic objectives of the Original Proposed Project, while evaluating the comparative merits of each alternative. The analysis focused on alternatives capable of eliminating significant adverse environmental effects or reducing them to less than significant levels, even if these alternatives would impede, to some degree, the attainment of the project objectives. In Section 7 of this Revised and Recirculated Draft EIR, potential environmental impacts of the Proposed Alternative Project are compared to impacts from the Original Proposed Project and the alternatives evaluated in the 2004 Draft EIR.

Alternatives Eliminated from Further Consideration

The 2005 Final EIR evaluated the Original Proposed Project and a reasonable range of alternatives to the Original Proposed Project and this Revised and Recirculated Draft EIR evaluates the Proposed Alternative Project. Section 7 of this Revised and Recirculated Draft EIR compares the Proposed Alternative Project to the Original Proposed Project and the alternatives previously addressed. No additional alternatives are considered and/or eliminated from further evaluation.

Alternatives Analyzed in this Revised and Recirculated Draft EIR

In addition to the Proposed Alternative Project evaluated in this Revised and Recirculated Draft EIR, the following alternatives are evaluated in relation to both the Original Proposed Project and Proposed Alternative Project. Table 7-2, Comparison of Alternatives, provides a summary of this Alternatives analysis.

No Project/No Development Alternative

Implementation of the No Project/No Development Alternative would retain the site in its current condition. None of the improvements proposed as part of the project and/or the existing designation would occur.

No Project/Existing Designation Alternative

Implementation of the No Project/Existing Designation Alternative would be in accordance with the existing Official Land Use District BV/RL-40 (40-acre minimum lot size). This Alternative would result in 1.5 residential lots on the project site. This Alternative would be less intensive than the Original Proposed Project and Proposed Alternative Project. Approximately three persons (1.5 housing units x 2.31 persons/household) would be added to the population of the Community of Fawnskin. It is further noted that in addition to a single-residential structure, other uses can be

allowed including those in the "Additional Uses" section of the County Development Code, subject to a Conditional Use Permit.

Reduced Density, Without Road Alignment and Without Marina Alternative

For the Reduced Density, Without Road Realignment and Without Marina Alternative, development of 62 residential lots and associated infrastructure would occur on the north side of the existing SR-38 alignment. SR-38 would not be realigned, no residential development (lakefront lots) would occur to the south of SR-38, and no marina would be developed. The land area south of SR-38, along the lakefront, would be retained in its current state. Approximately 143 persons (62 housing units x 2.31 persons/household) would be added to the population of the Community of Fawnskin.

Reduced Density, With Project Redesign Alternative

For the Reduced Density, With Project Redesign Alternative, development of 66 residential lots and associated infrastructure would occur on the project site. Implementation of this Alternative would include the realignment of SR-38. Twenty-one lots on the south (lake) side and 45 lots on the north side would be developed. SR-38 would be realigned to allow the 21 lakefront lots. This Alternative would include a marina facility with 72 boat slips. Approximately 152 persons (66 housing units x 2.31 persons/household) would be added to the population of the Community of Fawnskin.

Proposed Alternative Project

The Proposed Alternative Project would significantly reduce, but not eliminate, the environmental impacts associated with the construction and operation of the Original Proposed Project. Because this Alternative proposes 50 lots - a 46 percent reduction in residential density - with no lakefront residential development south of SR-38, and no realignment of SR-38, views of Big Bear Lake and the distant mountain ranges from SR-38 would not be obstructed when compared to the proposed 92-lot Original Proposed Project. In addition, fewer biological impacts would occur because less land would be disturbed and because 5.73 acres of the site would be reserved for open space/conservation. The Water Supply Report prepared for the Proposed Alternative Project has concluded that on-site wells can adequately provide water for the 50 residential lots proposed in this Alternative. The Proposed Alternative Project is environmentally superior to the 92-lot Original Proposed Project and meets most of the primary project objectives, but not to the same degree as the 92-lot Original Proposed Project.

Environmentally Superior Alternative

Based on the analysis of each alternative, the No Project – No Development alternative is the environmentally superior alternative because it eliminates all of the significant impacts of the proposed project.

CEQA Guidelines Section 15126.6 (e)(2) states the following:

If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

As shown in Table 7-2, project related impacts could be substantially reduced by not realigning SR-38. Furthermore, the impacts could also be reduced by decreasing the overall density and reducing the number of residential lots. The Applicant has amended the TTM to the standards of the 50-lot Proposed Alternative Project. While several of the alternatives are environmentally superior to the proposed 92-lot Project, the Proposed Alternative Project evaluated in detail in this Revised and Recirculated Draft EIR is the preferred alternative and the environmentally superior alternative to all but the No Project/No Development alternative and the No Project/Existing Designation Alternative for the following reasons:

- The Proposed Alternative Project has the fewest number of residential lots (50 lots – which represents a 46 percent reduction over the Original Proposed Project), and the largest minimum lot size (one half acre, with an average lot size of 0.90 acre and 12 lots over 1 acre in size);
- The Proposed Alternative Project includes 5.73 acres for Pebble Plain Habitat/Perch Tree conservation, Neighborhood Lake Access and open space as well as an area within the easternmost drainage that will be set aside for southern rubber boa habitat;
- A 10-acre off-site Pebble Plan habitat will also be purchased and dedicated as a Conservation Easement as part of the Proposed Alternative Project;
- The Proposed Alternative Project has no lakefront residential development south of SR-38 and no realignment of SR-38. As a result, views of Big Bear Lake and the distant mountain ranges from SR-38 would not be obstructed.
- The Water Supply Report prepared for the Proposed Alternative Project has concluded that on-site wells can adequately provide water for the 50 residential lots.
- The Proposed Alternative Project lessens the impacts of each impact area and reduces significant impacts to Aesthetics, Air Quality, and Water Supply to less than significant levels; and
- The Proposed Alternative Project would reduce the impacts to the greatest extent practicable, while meeting most of the project objectives and maintaining a sound and fiscally feasible project.

Therefore, the Proposed Alternative Project is the environmentally superior alternative.

Table ES-3: Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Section 4.1 - Aesthetics		
Short-Term Aesthetic/Light and Glare Impact	**A-1a** Construction equipment staging areas shall be located away from existing residential uses. Appropriate screening (i.e., temporary fencing with opaque material) shall be used to buffer views of construction equipment and material, when feasible. Staging locations shall be indicated on Project Grading Plans. (MM 5.4-1a) **A-1b** All construction-related lighting associated with the construction of new roadways, improvements to SR-38 and the installation of utilities shall be located and aimed away from adjacent residential areas. Lighting shall use the minimum wattage necessary to provide safety at the construction site. A construction safety lighting plan shall be submitted to the County for review along with Grading Permit applications for the subdivision of the lots. (MM 5.4-1b)	Less than significant
Long-Term Aesthetic Impact	**A-2a** All homes shall provide a two-car garage with automatic garage doors. (MM 5.4-2a) **A-2b** New development shall be subordinate to the natural setting and minimize reflective surfaces. Building materials including siding and roof materials shall be selected to blend in hue and brightness with the surroundings. Colors shall be earth tones: shades of grays, tans, browns, greens, and pale yellows; and shall be consistent with the mountain character of the area. (MM 5.4-2b) **A-2c** Outside parking/storage areas associated with the boat dock activities shall be screened from view by the placement of landscaping and plantings which are compatible with the local environment and, where practicable, are capable of surviving with a minimum of maintenance and supplemental water. (MM 5.4-2c) **A-2d** Construction plans for each individual lot shall include the identification and placement of vegetation with the mature height of trees listed. Landscaping and plantings should not obstruct significant views, within or outside of the project, either when installed or when they reach maturity. The removal of existing vegetation shall not be required to create views. (MM 5.4-2d) **A-2e** A Note shall be placed on the Composite Development Plan stating that during construction plans review and prior to issuance of building permits for each lot, the building inspector shall refer to the Mitigation Monitoring and Compliance Program regarding these aesthetic impact mitigation measures. The building inspector shall coordinate with the Advance Planning Division the review and approval of building plans in relation to these aesthetic impact mitigation measures, prior to approval and issuance of building permits. (MM 5.4-2e)	Less than significant

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Long-Term Scenic State Route Impact	**A-3a** Any entry sign for the development shall be a monument style sign compatible with the mountain character, preferably, rock or rock appearance. (MM 5.4-3a) **A-3b** Prior to recordation of the tract map (and/or any ground disturbance, whichever occurs first), landscaping or revegetation plans for lettered lots (A through D) shall be submitted to and approved by the San Bernardino County Land Use Services Department. (MM 5.4-3b)	Less than significant
Long-Term Light and Glare Impacts	**A-4a** All exterior lighting shall be designed and located as to avoid intrusive effects on adjacent residential properties and undeveloped areas adjacent to the project site. Low intensity street lighting and low-intensity exterior lighting shall be used throughout the development to the extent feasible. Lighting fixtures shall use shielding, if necessary to prevent spill lighting on adjacent off-site uses. (MM 5.4 4a) **A-4b** Lighting used for various components of the development plan shall be reviewed for light intensity levels, fixture height, fixture location and design by an independent engineer, and reviewed and approved by the County Building and Safety Division to ensure that light emitted from the proposed project does not intrude onto adjacent residential properties. (MM 5.4-4b) **A-4c** The project shall use minimally reflective glass. All other materials used on exterior buildings and structures shall be selected with attention to minimizing reflective glare. (MM 5.4-4c) **A-4d** Vegetated buffers shall be used along State Route 38 to reduce light intrusion on residential development and on forested areas located adjacent to the project site. The vegetation buffers shall be reflected on the master landscape plan submitted to and approved by the County Land Use Services Department prior to the issuance of the first grading permit. (MM 5.4-4d) **A-4e** All outdoor light fixtures shall be cutoff luminaries and only high- or low-pressure sodium lamps shall be used. (MM 5.4-4f) **A-4f** Mitigation Measures A-4a through A-4e shall be included in the Conditions, Covenants and Restrictions (CC&Rs) of the Home Owner's Association (HOA). (MM 5.4-4e)	Less than significant

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Section 4.2 - Air Quality/Green House Gas		
Construction (New measures supercede those identified in the 2005 Final EIR)	**AQ-1** Prior to construction of the project, the project proponent will provide a Fugitive Dust Control Plan that will describe the application of standard best management practices to control dust during construction. The Fugitive Dust Control Plan shall be submitted to the County and SCAQMD for approval and approved prior to construction. Best management practices will include, but not be limited to: • For any earth moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction. • For all disturbed surface areas (except completed grading areas), apply dust suppression in a sufficient quantity and frequency to maintain a stabilized surface; any areas which cannot be stabilized, as evidenced by wind driven dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area. • For all inactive disturbed surface areas, apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind-driven fugitive dust, excluding any areas that are inaccessible due to excessive slope or other safety conditions. • For all unpaved roads, water all roads used for any vehicular traffic once daily and restrict vehicle speed to 15 mph. • For all open storage piles, apply water to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust. **AQ-2** To reduce emissions from the construction equipment within the project site, the construction contractor will: • To the extent that equipment and technology is available and cost effective, the contractor shall use catalyst and filtration technologies. • All diesel-fueled engines used in construction of the project shall use ultra-low sulfur diesel fuel containing no more than 15-ppm sulfur, or a suitable alternative fuel. • All construction diesel engines, which have a rating of 50 hp or more, shall meet the Tier II California Emission Standards for off-road compression-ignition engines, unless certified by the contractor that such engine is not	Less than significant

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	available for a particular use. In the event that a Tier II engine is not available, Tier I compliant or 1996 or newer engines will be used preferentially. Older engines will only be used if the contractor certifies that compliance is not feasible. • Heavy-duty diesel equipment will be maintained in optimum running condition.	
Residential Wood Burning	**AQ-3** To reduce the emissions from wood burning apparatus; the following requirement will be placed on all new residences constructed on the proposed project's lots: • No open-hearth fireplace will be allowed in new construction, only EPA Phase II Certified fireplaces and wood stoves, pellet stoves, and natural gas fireplaces shall be allowed. **AQ-4** To establish a "Good Neighbor Policy for Burning" that will further help reduce the potential for localized nuisance complaints related to wood burning; the proponent shall distribute an informational flyer to each purchaser of lots. At a minimum, the flyer will say: • KNOW WHEN TO BURN - Monitor all fires; never leave a fire unattended. - Upgrade an older woodstove to one with a catalytic combustor that burns off excess pollutants. - Be courteous when visitors come to your home. Wood smoke can cause problems for people with developing or sensitive lungs (i.e. children, the elderly) and people with lung disease. • KNOW WHAT TO BURN - Split large pieces of wood into smaller pieces and make sure it has been seasoned (allowed to dry for a year). Burning fresh cut logs = smoky fires. - When buying wood from a dealer, do not assume it has been seasoned. - Small hot fires are more efficient and less wasteful than large fires. - Never burn chemically treated wood or non-wood materials. - Manufactured fire logs provide a nice ambience, have the least impact to air quality, and are a good choice for homeowners who use a fireplace infrequently.	Less than significant.

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	KNOW HOW TO BURN - Proper combustion is key. Make sure your wood fire is not starved; if excess smoke is coming from the chimney or stack, the fire isn't getting enough air. - Visually check your chimney or stack 10 to 15 minutes after you light a fire to ensure it is not emitting excess amounts of smoke. - Homeowners should have woodstoves and fireplaces serviced and cleaned yearly to ensure they are working properly.	
Section 4.3 - Biological Resources		
Special Status Biological Resources	***Special Status Plants and Plant Communities*** **BR-1a** Prior to the initiation of clearing or grading activities on the project site, the off-site 10 acre Dixie Lee Lane Pebble Plain Habitat shall be established as a conservation easement and a non-wasting endowment will be established for the monitoring and management of the preservation of the 10-acre site by the management entity (e.g., San Bernardino Mountains Land Trust (SBMLT) or other land stewardship entity) in perpetuity. **BR-1b** Prior to the initiation of clearing or grading activities on the project site, the 4.91-acre on-site conservation easement shall be established, the management entity will be approved by the CDFG, and a non-wasting endowment will be established for the monitoring and management of the preservation of the proposed conservation easement by the management entity in perpetuity. **BR-1c** Construction to the rear portions of Lots 47, 48, 49, and 50 shall be restricted by means of building envelopes or building setback lines to prevent construction in the occupied ash-gray paintbrush habitat, wherever feasible. **BR-1d** Long-term conservation areas will be actively managed to prevent edge-effects from existing and proposed adjacent land uses. A habitat management plan (HMP) will be developed for the on-site Conservation Easement area. The HMP shall address management of the rare plant preserve with respect to the following indirect impacts: • Removal and control of invasive non-native plants; • Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation; • Alteration of surface hydrological conditions caused by irrigation on adjacent lots, road runoff, or water diversions installed for erosion control;	Significant and unavoidable impacts related to Biological Resources have been identified for impacts to Bald Eagle.

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	• Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes. The HMP shall be administrered by the SBMLT or other land stewardship entity. Funding for implementation of habitat management measures shall be derived from interest earned from the habitat management endowment. ***Special Status Wildlife*** **BR-2** Trees and downed logs should be allowed to remain in place, to the extent that clearing is not required by the development process, and a 50-foot setback (measured on each side of the centerline) must be maintained along the deepest ravine at the eastern edge of the property. This measure will serve to preserve habitat for such species as southern rubber boa. **BR-3** The project proponent shall have a biologist qualified with San Bernardino flying squirrel (SBFS) as a monitor during tree removal. Minimize the number of trees, snags, and downed wood removed for project implementation. Compensating the removal of snags containing cavities, this would be achieved by constructing and erecting two nest boxes and one aggregate box per snag removed. Appendix B of this Revised and Recirculated Draft EIR provides the specifications of the nest and aggregate boxes (Flying Squirrels 2007). These boxes should be located on the adjacent U.S. Forest Service (USFS) land (with their permission) and the locations marked with a global positioning system. The locations of the boxes shall be provided to the USFS so that their biologists could monitor the boxes for occupation by SBFS. Provide new homeowners with a flyer that would provide information on the biology of SBFS and how they are susceptible to depredation by cats. The flyer would also outline steps that homeowners could take to reduce their urban edge effects. **BR-4** Trees identified in Exhibits 3 and 4 of the Bald Eagle Survey Report (Appendix B of this Revised and Recirculated Draft EIR) as eagle perch locations shall be preserved in place upon project completion. If any of the designated perch trees should become hazardous and need to be taken down, replacement will be at a 5:1 ratio with the creation of artificial perch trees along shoreline designated open space. Any development that may occur within the project site and in the individual lots must avoid impacts to trees larger than 24 inches diameter breast height (dbh) and their root structures to the maximum extent feasible. If any additional non-perch trees on-site larger than 24 inches dbh are removed, than a replacement ratio of 2:1 shall be required and replacement trees should be 24-inch box trees. All construction or landscaping improvements, including irrigation, will	

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan. **BR-5** Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed to identify all large trees (i.e., greater than 20 inches in diameter at 4.5 feet from the ground) within 600 feet from the high water line. Trees identified on the project site as having a diameter in excess of 20 inches at 4.5 feet from the ground within 600 feet of the shoreline shall be documented and tagged. Any development that may occur within the project site and in the individual lots shall avoid impacts to tagged trees and their root structures. If such trees cannot be avoided, their removal shall be coordinated with the County of San Bernardino to minimize impacts to the extent feasible. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan. **BR-6** Seven days prior to the onset of construction activities, a qualified biologist shall survey within the limits of project disturbance for the presence of any active raptor nests. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG. If nesting activity is present at any raptor nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for raptors in the region of the project site normally occurs from February 1 to June 30. To protect any nest site, the following restrictions on construction are required between February 1 and June 30 (or until nests are no longer active as determined by a qualified biologist): (1) clearing limits shall be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying shall not be allowed within 200 feet of any occupied nest. Any encroachment into the 300/200-foot buffer area around the known nest shall only be allowed if it is determined by a qualified biologist that the proposed activity shall not disturb the nest occupants. Construction during the nesting season can occur only at the sites if a qualified biologist has determined that fledglings have left the nest.	

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	BR-7 Vegetation removal, clearing, and grading on the project site shall be performed outside of the breeding and nesting season (between February 1 and June 30), when feasible, to minimize the effects of these activities on breeding activities of migratory birds and other species. If clearing occurs during breeding season, a 30-day clearance survey for nesting birds shall be conducted. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG. If nesting activity is present at any nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. **BR-8** The use of the boat dock for motorized boating shall be prohibited between the dates of December 1 and April 1. No motorized boats shall be allowed to launch or moor in the vicinity of the boat dock at any time during this period. This restriction shall be clearly displayed on signage at the entrance to the parking lot and on the boat dock visible from both land and water. This requirement shall also be published in the Homeowner's Association Conditions, Covenants & Restrictions (CC&Rs).	
Sensitive Natural Communities/Habitats	***Wildlife Impacts/Indirect Impacts*** **BR-9** Street lamps on the project site shall not exceed 20 feet in height, shall be fully shielded to focus light onto the street surface and shall avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights shall utilize low color temperature lighting (e.g., red or orange). **BR-10** Outdoor lighting for proposed homes on the individual tentative tracts shall not exceed 1,000 lumens. Furthermore, residential outdoor lighting shall not exceed 20 feet in height and must be shielded and focused downward to avoid lighting spillover onto adjacent open space or properties. These restrictions on outdoor lighting of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This requirement shall also be published in the Homeowner's Association CC&Rs. **BR-11** To limit the amount of human disturbance on adjacent natural open space areas, signs shall be posted along the northern and eastern perimeter of the project site where the property boundary abuts USFS open space with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash at all times." In addition, a requirement stating that residents shall keep out of adjacent open space areas to the north with the exception of designated trails will be published in	Less than significant impact

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents. **BR-12** Prior to recordation of the final map, a landscaping plan for the entire tract shall be prepared (inclusive of a plant palette) with an emphasis on native trees and plant species, and shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review shall determine that invasive, non-native plant species are not to be used in the proposed landscaping. The biologist will suggest appropriate native plant substitutes or non-invasive, non-native plants. A note shall be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform to the overall approved tract map landscaping plan. A requirement shall be included stating that residents shall include a restriction of the use of tree and plant species to only trees/plants approved per the overall tract map landscaping plan, the Homeowner Association CC&Rs shall also restrict (individual lot owners) to use only tree and plant species approved per the overall tract map landscaping plan.	
Section 4.4 - Hydrology		
Flood Control/Drainage Channels	**HYD-1** Prior to issuance of a building permit, a program satisfactory to the County will be formulated to handle storm drain waters adequately. **HYD-2** All required drainage improvements must be designed and constructed to County standards. Tentative tract map, site plan, and other precise plans for individual lots will be accompanied by adequate plans for drainage improvements prepared by registered professional engineers. **HYD-3** The proposed cross culverts shall be sized for 100-year burn and bulking flow rates. The burn and bulking method would increase the runoff from the natural areas. The method provided in the Los Angeles County Hydrology Manual is recommended. In addition, the cross culverts shall all be designed with headwalls to prevent CMP crushing, and shall be maintained adequately.	Less than significant impact
Water Quality Construction Impacts	**HYD-4** To mitigate sediment transport during construction, the developer shall submit a sedimentation control plan with the grading plan for review and approval by the Public Works Department. The Project engineer shall certify compliance. **HYD-5** Prior to Grading Permit issuance and as part of the Proposed Alternative Project's compliance with the NPDES requirements, a Notice of Intent (NOI) shall	Less than significant impact

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	be prepared and submitted to the Santa Ana Regional Water Quality Control Board providing notification and intent to comply with the State of California general permit. Also, a Storm Water Pollution Prevention Plan (SWPPP) shall be completed for the construction activities on-site. A copy of the SWPPP shall be available and implemented at the construction-site at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction-site to the "maximum extent practicable." **HYD-6** At a minimum, the following shall be implemented from the California Storm Water Best Management Practice Handbook - Construction Activity: • Dewatering Operations – This operation requires the use of sediment controls to prevent or reduce the discharge of pollutants to storm water from dewatering operations. • Paving Operations – Prevent or reduce the runoff of pollutants from paving operations by proper storage of materials, protecting storm drain facilities during construction, and training employees. • Structural Construction and Painting – Keep site and area clean and orderly, use erosion control, use proper storage facilities, use safe products and train employees to prevent and reduce pollutant discharge to storm water facilities from construction and painting. • Material Delivery and Storage – Minimize the storage of hazardous materials on-site. If stored on-site, keep in designated areas, install secondary containment, conduct regular inspections and train employees. • Material Use – Prevent and reduce the discharge of pesticides, herbicides, fertilizers, detergents, plaster, petroleum products and other hazardous materials from entering the storm water. • Solid Waste Management – This BMP describes the requirements to properly design and maintain trash storage areas. The primary design feature requires the storage of trash in covered areas. • Hazardous Waste Management – This BMP describes the requirements to properly design and maintain waste areas. • Concrete Waste Management – Prevent and reduce pollutant discharge to storm water from concrete waste by performing on and off-site washouts in designated areas and training employees and consultants.	

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	• Sanitary Septic Water Management – Provide convenient, well-maintained facilities, and arrange regular service and disposal of sanitary waste. • Vehicle and Equipment Cleaning – Use off-site facilities or wash in designated areas to reduce pollutant discharge into the storm drain facilities. • Vehicle and Equipment Fueling – Use off-site facilities or designated areas with enclosures or coverings to reduce pollutant discharge into the storm drain facilities. • Vehicle and Equipment Maintenance – Use off-site facilities or designated areas with enclosing or coverings to reduce pollutant discharge into the storm drain facilities. In addition, run a "dry site" to prevent pollution discharge into storm drains. • Employee and Subcontractor Training – Have a training session for employees and subcontractors to understand the need for implementation and usage of BMPs. • Preservation of Existing Vegetation – Minimize the removal of existing trees and shrubs since they serve as erosion control. • Seeding and Planting – Provide soil stability by planting and seeding grasses, trees, shrubs, vines, and ground cover. • Mulching – Stabilize cleared or freshly seeded areas with mulch. • Geotextiles and Mats – Natural or synthetics material can be used for soil stability. • Dust Control – Reduce wind erosion and dust generated by construction activities by using dust control measures. • Construction Road Stabilization – All on-site vehicle transport routes shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust. • Stabilized Construction Entrance – Stabilize the entrance pad to the construction area to reduce amount of sediment tracked off-site. • Earth Dikes – Construct earth dikes of compacted soil to divert runoff or channel water to a desired location.	

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	• Temporary Drains and Swales – Use temporary drains and swales to divert off-site runoff around the construction-site and stabilized areas and to direct it into sediment basins or traps. • Outlet Protection – Use rock or grouted rock at outlet pipes to prevent scouring of soil caused by high velocities. • Check Dams – Use check dams to reduce velocities of concentrated flows, thereby reducing erosion and promoting sedimentation behind the dams. Check dams are small and placed across swales and drainage ditches. • Silt Fence – Composed of filter fabric, these are entrenched, attached to support poles, and sometimes backed by wire fence support. Silt fences promote sedimentation behind the fence of sediment-laden water. • Straw Bale Barrier – Place straw bales end to end in a level contour in a shallow trench and stake them in place. The bales detain runoff and promote sedimentation. • Sand Bag Barriers – By stacking sand bags on a level contour, a barrier is created to detain sediment-laden water. The barrier promotes sedimentation. • Brush or Rock Filter – Made of 0.75 to 3-inch diameter rocks placed on a level contour or composed of brush wrapped in filter cloth and staked to the toe of the slope provides a sediment trap. • Storm Drain Inlet Protection – Devices that remove sediment from sediment laden storm water before entering the storm drain inlet or catch basin. • Sediment Trap – A sediment trap is a small, excavated, or bermed area where runoff for small drainage areas can pass through allowing sediment to settle out.	
Long-Term Operational Impacts	**HYD-7** A water quality maintenance program will be implemented to mitigate the impact of Proposed Alternative Project generated runoff on surface water quality over the long term. The program outlined in Water Pollution Aspects of Street Surface Contaminants (prepared by the United States Environmental Protection Agency) provides recommendations for street cleaning and prevention of pollution generation.	Less than significant impact

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	• Prior to Grading Permit issuance, a Water Quality Management Plan (WQMP) shall be developed and shall include both Non-Structural and Source Control BMPs. The WQMP shall conform to the San Bernardino County Draft NPDES permit and WQMP standards. The following are the minimum required controls to be implemented as a part of the WQMP for Urban Runoff. • Education for Property Owners, Tenants and Occupations – The Property Owners Association is required to provide awareness educational material, including information provided by San Bernardino County. The materials shall include a description of chemicals that should be limited to the property and proper disposal, including prohibition of hosing waste directly to gutters, catch basins, storm drains or the lake. • Activity Restrictions – The developer shall prepare conditions, covenants and restriction of the protection of surface water quality. • Common Area Landscape Management – For the common landscape areas on-going maintenance shall occur consistent with County Administrative Design Guidelines or city equivalent, plus fertilizer and pesticide usage consistent with the instructions contained on product labels and with regulation administered by the State Department of Pesticide Regulation or county equivalent. • Common Area Catch Basin Inspection – Property Owners Associations shall have privately owned catch basins cleaned and maintained, as needed. These are intended to prevent sediment, garden waste, trash and other pollutants from entering the public streets and storm drain systems. • Common Area Litter Control – POAs shall be required to implement trash management and litter control procedures to minimize pollution to drainage waters. • Street Sweeping Private Streets and Parking Lots – Streets and Parking lots shall be swept as needed, to prevent sediment, garden waste, trash and other pollutants from entering public streets and storm drain systems.	

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	HYD-8 The following controls from the California Storm Water Best Management Practice Handbook – Municipal shall be employed: • Housekeeping Practices – This entails practices such as cleaning up spills, proper disposal of certain substances and wise application of chemicals. • Used Oil Recycling – May apply to maintenance and security vehicles. • Vegetation Controls – Vegetation control typically includes chemical (herbicide) application and mechanical methods. Chemical methods are discussed in SC10. Mechanical methods include leaving existing vegetation, cutting less frequently, hand cutting, planting low maintenance vegetation, collecting and properly disposing of clippings and cuttings, and educating employees and the public. • Storm Drain Flushing – Although general storm drain gradients are sufficiently steep for self-cleansing, visual inspection may reveal a buildup of sediment and other pollutants at the inlets or outlets, in which case flushing may be advisable. **HYD-9** The Water Quality Management Plan (WQMP) shall include Structural or Treatment BMPs. The structural BMPs utilized shall focus on meeting potential TMDL requirements for noxious aquatic plants, nutrients, sedimentation and siltation. The structural BMPs shall conform to the San Bernardino County NPDES permit and the San Bernardino WQMP standards. **HYD-10** Consistent with the WQMP guidelines contained in the Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for San Bernardino County, Structural BMPs shall be required for the Proposed Alternative Project. They shall be sized to comply with one of the following numeric sizing criteria or be considered by the Permitees to provide equivalent or better treatment. Volume-based BMPs shall be designed to infiltrate or treat either: • The volume of runoff produced from the 85th percentile 24-hour storm event, as determined from the local historical rainfall record; or • The volume of the annual runoff produced by the 85th percentile 24-hours rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or	

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	• The volume of annual runoff based on unit basin storage volume, to achieve 80 percent or more volume treatment by the method recommended in California Stormwater Best Management Practice Handbook – Industrial/Commercial (1993); or • The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event. - OR - Flow-based BMPs shall be designed to infiltrate or treat either: • The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour;or • The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or • The maximum flow rate of runoff, as determined from the local historical rainfall record that achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two. **HYD-11** The following are the minimum required controls to be implemented as a part of the Water Quality Management Plan (WQMP) for Urban Runoff. • Control of Impervious Runoff – Surface runoff shall be directed to landscaped areas or pervious areas. • Common Area Efficient Irrigation – Physical implementation of the landscape plan consistent with County Administrative Design Guidelines or city equivalent, which may include provision of water sensors, programmable irrigation timers, etc. • Common Area Runoff – Minimizing Landscape Design – Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. • Catch Basin Stenciling – "No Dumping – Flows to Lake" or equivalent effective phrase shall be stenciled on catch basins to alert the public as to the destination of pollutant discharging into storm drain.	

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	• Debris Posts – These shall be installed to prevent large floatable debris from entering the storm drains. They shall be placed upstream of the cross culverts. • Inlet Trash Racks – These shall be installed where appropriate to reduce intake and transport through the storm drain system of large floatable debris. Trash racks shall be provided where drainage from open areas enters storm drain or cross culverts. **HYD-12** Storm water treatment under the NPDES Permit and the future TMDL requirements shall include the construction of treatment BMPs. **HYD-13** Treatment BMPs appropriate for on-site use shall include infiltration trenches and basins, swales, inlet filtration, and/or water quality basins. **HYD-14** All storm water runoff shall be treated before leaving the site to reduce pollutants in Big Bear Lake.	
Infiltration Trenches and Basins	**HYD-15** Infiltration trenches and/or basins shall be used on site to meet potential future TMDLs for noxious aquatic plants and nutrients. Infiltration trenches and basins treat storm water runoff through filtration. A typical infiltration trench is essentially an excavated trench that is lined with filter fabric and backfilled with stones. Depth of the infiltration trench shall range from three to eight feet and shall be located in areas with permeable soils, and water table and bedrock depth situated well below the bottom of the trench. Trenches shall not be used to trap coarse sediments since large sediment would likely clog the trench. Grass buffers may be installed to capture sediment before it enters the trench to minimize clogging. Infiltration basins shall be used for drainage areas between 5 and 50 acres. Infiltration basins shall be either in-line or offline, and may treat different volumes such as the water quality volume or the 2-year or 10-year storm.	Less than significant impact
Swales	**HYD-16** The Proposed Alternative Project shall implement either vegetative swales, enhanced vegetated swales utilizing check dams and wide depressions, a series of small detention facilities designed similarly to a dry detention basin, or a combination of these treatment methods into a treatment train (series of Structural BMPs). The Water Quality Management Plan shall address treatment for the Proposed Alternative Project to assure that runoff from the site is treated to the "maximum extent practicable." The swales shall be treated as water quality features and shall be maintained differently than grass areas. Specifically, pesticides, herbicide, and fertilizers, which may be used on the grass areas, shall not be used in	Less than significant impact

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	the vegetation swales.	
Filtration	**HYD- 17** Filtration shall be implemented as a treatment method and shall use drop-in infiltration devices or inline devices. Drop-infiltration devices at all curb inlets within the internal parking lots shall be implemented to provide potential pollutant removal. Existing examples of these filtration devices include the Drain Pac Storm Drain Inserts and Fossil Filters. These types of devices are efficient at removing oil and grease, debris, and suspended solids from treated waters. Some of these devices have also exhibited high efficiencies at removing heavy metals and other pollutants. Inline devices suggested for use on-site include the Continuous Deflection Separator (CDS unit). Once the runoff has entered the storm drain, an in-line diversion would direct the treatment flow to a CDS unit. The CDS unit is a non-blocking, non-mechanical screening system, which would provide a second line of defense for solids removal. Adsorption materials can be added within the CDS unit to aid in the removal of oil and grease. The treated flow would then exit the CDS unit and continue downstream. Monitoring of filtration devices shall be conducted. The use of street sweeps on the parking lots and streets shall aid in reducing the amounts of sediment and debris that flow through the devices. This would extend the effectiveness of the devices during a storm event and would lower the frequency of required maintenance. The devices shall be checked and cleaned, if necessary, once a month during the rainy season, following any precipitation and at the end of the dry season prior to the first precipitation event of the rainy season. Consideration shall be given to using these filtration units in other areas besides the parking lot inlets. Another potential location is at the downstream end of the tributary pipes that feed the discharge point. Siting these units at a downstream point would allow for the treatment of a greater amount of runoff.	Less than significant impact
Jurisdictional Waters	**HYD-18** The Developer shall comply with any requirements of the U.S. Army Corps of Engineers (ACOE) and the California Department of Fish and Game (**CDFG)** regarding water quality and drainage. **HYD- 19** A well located on the site of the Proposed Alternative Project, if not used as a water supply well or a monitoring well, shall be capped and taken out of service in accordance with accepted civil engineering standards.	Less than significant impact

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Section 4.5 – Land Use		
	Based on the project design and mitigation measures listed in other sections of the EIR, the impacts due to the proposed zone change and GPA are considered less than significant. Furthermore, mitigation measures related to land use, such as noise, traffic, and aesthetics have been incorporated into the other sections of the Revised and Recirculated Draft EIR, as appropriate. These measures further reduce any potential land use impacts, and no additional mitigation is recommended for land use impacts.	No significant impacts
Section 4.6 - Noise		
Construction Activities	**NOI-1** Construction contractors shall be required to ensure that construction equipment is well tuned and maintained according to the manufacturer's specifications, and that the equipment's standard noise reduction devices are in good working order. (MM5.7-1b, modified.) **NOI-2** Consistent with the County of San Bernardino Development Code Section 87.0901, construction activities shall be limited as follows (MM 5.7-1a modified): For general construction activities, the operation of construction equipment and outdoor construction or repair work shall be limited to the hours between 7:00 a.m. and 7:00 p.m., Monday through Saturday. **NOI-3** Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturers' specifications) and by shrouding or shielding impact tools. All equipment shall have sound-control devices no less effective than those provided by the manufacturer. (MM5.7-1c, modified.) **NOI-4** Construction activities contractors shall locate fixed construction equipment (such as compressors and generators) and construction staging areas as far as possible from adjacent residences. Activities within these staging areas shall conform to the time limitations established in Mitigation Measure NOI-2. (MM5.7-1d, modified.)	Less than significant impact
Section 4.7 – Public Services		
Public Services	The following mitigation measures identified for the Original Proposed Project are incorporated into the Proposed Alternative Project, with revisions as appropriate:	Less than significant impact

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	Fire Protection **PS-1** The fire flow requirement shall be 1750 gpm @ 2 hours based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm @ 2 hours for homes greater than 4,800 square feet. (MM 5.3-1a.) **PS-2** All residences less than 5,000 square feet shall be subject to the standard fire sprinkler requirement (NFPA 13D). Homes above 5,000 square feet shall be subject to the NFPA13R sprinkler requirement. (MM 5.3-1b, as modified.) **PS-3** A Fuels Management Plan, with specifications, shall be prepared and subject to approval by the County of San Bernardino Fire Department and San Bernardino National Forest Service. The Fuels Management Plan shall implement the fire safety requirements of the FS1 Fire Safety Overlay District, including a 100-foot minimum setback requirement from the National Forest. The fuel modification zone shall be located entirely within the project boundaries. The minimum fuel modification zone requirements may be greater in steeper areas (up to 300 feet), as determined by the Fire Department. (MM 5.3-1c, as modified.) **PS-4** A Homeowner's Association shall be established to implement the Fuels Management Plan. The Fuels Management Plan shall specify any professional assistance, if necessary, to implement the action portion of the plan. The Plan shall determine if a Registered Professional Forrester is necessary for professional guidance to implement the Plan. The HOA is to be responsible for fuel modification in common areas. (MM 5.3-1e, as modified.) ***Police Protection*** No mitigation measures are recommended. ***Schools*** No mitigation measures are recommended. ***Libraries*** No mitigation measures are recommended.	
Section 4.8 - Traffic		
Traffic	**T-1** Project Design Features recommended in the TIA shall be incorporated into the project design. These include: • Construction of North Shore Drive at its ultimate half-section width as a Mountain Major highway from Canyon Drive to the Easterly project boundary.	Less than significant impact

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	• Installation of a stop sign control at Driveway #1 and Driveway #2. • Construction of an Eastbound Left Turn Lane at Driveway 1/North Shore Drive and Driveway 2/ North Shore Drive for 2030 Buildout Conditions. • Construction of a 2nd Eastbound Through Lane at Driveway /North Shore Drive and Driveway 2/North Shore Drive for 2030 Buildout Conditions. **T-2** The eastbound left turn lanes at both project access points will be constructed at opening year at 100% cost to the Applicant. The Applicant shall pay fair share costs of the construction of the eastbound through lanes at both project access points for the horizon year conditions. The developer shall pay the fair share cost of $48,921 toward the off-site traffic improvements recommended in Appendix G of the San Bernardino Congestion Management Program, 2003 Update.	
Section 4.9 - Utilities		
Water	The following new mitigation measures identified for the Proposed Alternative Project supersede those identified for the Original Proposed Project. ***Water*** **U-1a** The Moon Camp Home Owners Association shall create a "conservation guidelines" booklet that outlines the following measures: • All indoor water fixtures shall be low flow / low flush. • Landscape shall not be irrigated between the hours of 9:00 a.m. and 6:00 p.m. • Residences, buildings, and premises shall be limited to watering landscaping every other day. • Water from landscape irrigation shall not be allowed to run off into streets or other paved areas. • Water leaks are not permitted and must be repaired as soon as practicable. • Sidewalks, paved driveways, and parkways shall not be washed off with hoses, except as required for sanitary purposes. • Washing non-commercial vehicles (cars, boats RVs) is permitted; however, it shall only be permitted with an automatic shut-off nozzle on a hose, or with a bucket. • Turf landscaping shall be limited to 500 square feet on a parcel or lot unless the water purveyor's regulations allow additional turf area.	Less than significant impact

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	• Turf irrigation shall include an automatic controller that incorporates evapo-transpiration and rain shutoff features. • Sprinklers are only allowed on turf. All other landscape plantings must be irrigated with efficient, low water use devices, such as, drip systems or bubblers. • All outdoor irrigation systems shall be shut off and winterized between November 1st and April 1st of each year. • A model landscaping and irrigation guide shall be prepared for the tract and required by homeowner association rules. The guide shall identify the following conservation measures: Landscaping shall include a plant palate that emphasizes Xeriscape, native plants and cultivars that are suitable for the mountain climate. Plant materials shall be low water consuming and fire resistant. Irrigation shall limit aerial spray methods and shall emphasize drip and bubbler type emitters. The landscaping guidelines shall be reviewed and approved by the Land Use Services Department. • The Project shall comply with the local water agency's "Model Landscape and Irrigation" ordinance. **U-1b** Pumping and extraction of groundwater shall be limited to 9 acre-feet per year for Well FP-2, 0 acre-feet per year for Well FP-3 and 5 acre-feet per year for Well FP-4. If the water purveyor desires to extract groundwater from Well FP-2 in excess of 9 acre-feet per year, the purveyor shall conduct an independent environmental analysis to identify and consider potential impacts at that time. **U-1c** The grant deeds transferring ownership of Wells FP-2, FP-3 and FP-4 shall include the pumping and extraction limitations included in Mitigation Measure U-1b. The grant deeds shall also state that the water purveyor, on January 1st of each year, shall report the amount of the prior year's annual groundwater production from Wells FP-2, FP-3 and FP-4 to the County Land Use Services Department and the County Health Department.	
Wastewater	The following measures identified for the Original Proposed Project are incorporated into the Proposed Alternative Project, with revisions as appropriate: **U-2** Prior to issuance of building permits, the Applicant shall fund all on-site and off-site sewer improvements required to support development of the Project site. Such improvements shall be to the satisfaction of the County Service Area (CSA) 53B.	Less than significant impact.

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	U-3 Prior to issuance of building permits, the Applicant shall provide evidence to the County of San Bernardino that the BBARWA has sufficient transmission and treatment plant capacity to accept sewage flows from the Project site. ***Solid Waste*** No mitigation measures are recommended ***Natural Gas*** No mitigation measures are recommended ***Electricity*** No mitigation measures are recommended	
Mitigation measures for the following issues that were addressed in the 2005 Final EIR for the Original Proposed Project would also apply to the Proposed Alternative Project. Several of these mitigation measures have been revised based on comments received on the project.		
Cultural Resources		
Archaeological/Historical Resources	**5.9-1** Project-related grading, grubbing, trenching, excavations, and/or other earth-moving activities in the project area shall be monitored by a qualified archaeologist. In the event that a material of potential cultural significance is uncovered during such activities on the project site, all earth-moving activities in the project area shall cease and the archeologist shall evaluate the quality and significance of the material. Earth-moving activities shall not continue in the area where a material of potential cultural significance is uncovered until resources have been completely removed by the archaeologist and recorded as appropriate.	Less than significant impact.
Paleontological Resources	**5.9-2a** Grading shall be monitored during excavation in areas identified as likely to contain paleontologic resources by a qualified paleontological monitor. Monitoring shall be accomplished for any undisturbed subsurface older alluvium, which might be present in the subsurface. The monitor shall be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments which are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert grading equipment to allow for removal of abundant or large specimens. **5.9-2b** Recovered specimens shall be prepared to a point of identification and	Less than significant impact.

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. **5.9-2c** Identification and curation of specimens into a museum repository with permanent retrievable storage shall occur for paleontological resources. **5.9-2d** A report of findings shall be prepared with an appended itemized inventory of specimens. The report shall include pertinent discussion of the significance of all recovered resources where appropriate. The report and inventory when submitted to the appropriate Lead Agency, shall signify completion of the program to mitigate impacts to paleontologic resources.	
Burial Sites	**5.9-3** In the event human remains are discovered during grading/ construction activities, work shall cease in the immediate area of the discovery and the Project Applicant shall comply with the requirements and procedures set forth in Section 5097.98 of the Public Resources Code, including notification of the County Coroner, notification of the Native American Heritage Commission, and consultation with the individual identified by the Native American Heritage Commission to be the "most likely descendent."	Less than significant impact.
Geology and Soils		
Slope Stability	**GS-1** The stability of south facing cut slopes shall be analyzed as part of the design-level geotechnical investigation. Utilizing 2:1 buttressed slopes using on-site native soil materials, or constructing geotextile-reinforced soil buttresses for planned unstable cut slopes are typical engineering designs for stabilizing slopes. Either of these methods, or other methods, must be approved by the San Bernardino County Department of Building and Safety. .(MM 5.10-1 of the 2005 Final EIR was modified in response to comments on the 2005 Draft EIR.)	Less than significant impact.
Soil Erosion	**GS-2a** Due to the potential for erosion associated with younger alluvial deposits within the two major on-site stream channels, increased surface drainage quantities associated with development on-site shall be directed away from the stream channels. (MM5.10-2a of the 2005 Final EIR.) **GS2b** Prior to the issuance of Grading Permits, the Project Applicant shall prepare a Soil Erosion and Sedimentation Plan for submittal and approval by the County Building and Safety Department. (MM 5.10-2b of the 2005 Final EIR.)	Less than significant impact.
Ground Shaking	**GS-3** Engineering design for all structures and roadways shall be based on the current California Uniform Building Code at the time of project development. Construction plans shall be in accordance with seismic design standards set forth by	Less than significant impact.

Table ES-3 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	the County's Development Code and Uniform Building Code. (MM 5.10-3 of the 2005 Final EIR.)	
Seiche	**GS-4** Residential structures shall be located in areas which provide a minimum of five feet of freeboard above the high water line for any structures. (MM 5.10-4 of the 2005 Final EIR.)	Less than significant impact.
Expansive Soils	**GS-5** Prior to grading permit issuance, a quantitative geotechnical analysis and design-level geotechnical engineering report shall be required and submitted to the County of San Bernardino Department of Building and Safety for their approval. (MM 5.10-5 of the 2005 Final EIR has been modified in response to comments on the 2005 Final EIR.)	Less than significant impact.
Recreation		
Expansion and/or Construction of Recreational Facilities	No mitigation measures are recommended	
Public Access	**R-1** The proposed project shall be conditioned to provide the right of way to allow future construction of a pedal path along the south side of North Shore Drive, prior to map recordation. The right-of-way is included in the 66-foot offer of dedication included on the Site Plan. (MM 5.2-2 of the 2005 Final EIR has been modified in response to public comments to provide access.)	Less than significant impact.

SECTION 1: INTRODUCTION

1.1 - Purpose of the EIR

The County of San Bernardino is the Lead Agency under the California Environmental Quality Act (CEQA) and is responsible for preparing the Environmental Impact Report (EIR) for the Moon Camp Residential Subdivision, Tentative Tract No. 16136 Project (State Clearinghouse No. 2002021105). This EIR has been prepared in conformance with CEQA (California Public Resources Code Section 21000 et. seq.), the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000 et. seq.), and the rules, regulations, and procedures for implementation of CEQA, as adopted by the County of San Bernardino. The principal CEQA Guidelines sections governing content of this document are Sections 15120 through 15132 (Content of an EIR), Section 15161 (Project EIR), and Section 15088.5 (Recirculation of an EIR Prior to Certification).

The County of San Bernardino (County) has prepared this Revised and Recirculated Draft EIR to provide responsible and trustee agencies, interested parties, and the public with information about the potential environmental effects associated with the Revised Moon Camp Residential Subdivision Project (Proposed Alternative Project) on approximately 62.43 acres located in the Community of Fawnskin in San Bernardino County, California. The revised tract map shows 50 numbered lots and seven lettered lots for Open Space/Conservation, a parking lot and boat ramp for the proposed 55-slip marina, three water well sites, and a potential reservoir site. The Fawnskin Community is located in the San Bernardino Mountains along the north shore of Big Bear Lake.

As described in the CEQA Guidelines Section 15121(s), an EIR is a public information document that assesses potential environmental impacts of a proposed project and identifies mitigation measures and alternatives to the project that could reduce or avoid adverse impacts. A Final EIR evaluating the original Moon Camp 92-lot residential subdivision (Original Proposed Project) was completed in December 2005, in compliance with CEQA (Public Resources Code §§21000 et seq.), and the CEQA Guidelines (California Code of Regulations (CCR), Title 14, §§15000 et seq.).

Subsequent to the completion of the 2005 Final EIR, and in response to public comments received on the document, the Applicant revised the project. As discussed in detail below, the Applicant revised numerous aspects of the project, including reducing the proposed density by 46 percent, increasing the minimum lot size to one-half acre, eliminating development south of State Route 38 (SR-38) along the shore of Big Bear Lake, including neighborhood access to the lakefront, eliminating the realignment of SR-38, preserving 5.73 acres of open space areas to conserve valuable biological habitat, purchasing/conserving 10 acres of offsite Pebble Plain, and reducing the size of and relocating the Marina.

As discussed in detail in this Revised and Re-circulated Draft EIR, the Applicant has proposed an alternative (i.e.,Proposed Alternative Project) to the original project that substantially reduces and

avoids (in some cases) the significant environmental impacts that were identified in the 2005 Final EIR. Although the Proposed Alternative Project is environmentally superior to the Original Proposed Project analyzed in the 2005 Final EIR, due to the scope of the project revisions and alterations, the County, as CEQA Lead Agency, has decided to prepare this Revised and Recirculated Draft EIR to fully disclose and analyze the potential environmental impacts of this alternative. Additionally, recirculation of the EIR will further the basic purpose of CEQA to inform decision makers and the public about the potential significant environmental effects of proposed activities.

This Revised and Recirculated Draft EIR evaluates the potential environmental effects of the Proposed Alternative Project to the degree of specificity appropriate to the current proposed actions, as required by Section 15146 of the CEQA Guidelines. The analysis considers the actions associated with the Proposed Alternative Project, to determine the short-term and long-term effects of its implementation. This EIR discusses both the direct and indirect impacts of the Proposed Alternative Project, as well as the cumulative impacts associated with other past, present, and reasonably foreseeable future projects. The severity of these impacts are compared to those identified for the Original Proposed Project (92 lots) that was evaluated in the 2005 Final EIR. This EIR also provides a comparison of the Proposed Alternative Project to the Original Proposed Project and the alternatives evaluated in the 2005 Final EIR.

CEQA requires the preparation of an objective, full disclosure document to inform agency decision makers and the general public of the direct and indirect environmental effects of a proposed action; provide mitigation measures to significantly reduce or eliminate significant adverse effects; and identify and evaluate reasonable alternatives that could avoid or substantially lessen one or more of such effects to the proposed project. The subject of this Revised and Recirculated Draft EIR is such an alternative project.

1.2 - Compliance with CEQA

For the convenience of the EIR reviewer, the entire 2005 Final EIR, including technical appendices, is included in this Revised and Recirculated Draft EIR on a CD at the back of the document. References are made throughout this document to that previous document, which can be viewed on the attached CD.

Like the 2005 Final EIR, this Revised and Recirculated Draft EIR is subject to a 45-day review period by responsible and trustee agencies and interested parties. In accordance with the provision of Sections 15085(a) and 15087(a)(1) of the CEQA Guidelines, as amended, the County of San Bernardino, serving as the Lead Agency, will: 1) publish a notice of availability of a Draft Re-circulated EIR in newspapers of local and general circulation, respectively; and, 2) will prepare and transmit a Notice of Completion (NOC) to the State Clearinghouse. (Proof of publication is available at the offices of the Lead Agency.)

Any public agency or members of the public desiring to comment on the Revised and Recirculated Draft EIR must submit their comments in writing to the individual identified herein prior to the end of the public review period. Upon the close of the public review period, the Lead Agency will then proceed to evaluate and prepare responses to all relevant comments received from both citizens and public agencies during the public review period.

Comments on the Revised and Recirculated Draft EIR should be addressed to the following:

County of San Bernardino
Land Use Services Department
385 North Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415-0182
Attention: Matt Slowik, Senior Planner

The 2010 Final EIR will consist of the 2005 Final EIR, the 2010 Revised and Recirculated Draft EIR, comments on and responses to the 2010 Revised and Recirculated Draft EIR, and the Mitigation Monitoring and Reporting Program (MMRP). After the Final EIR is completed and at least 10 days prior to action, a copy of the specific response to comments made by public agencies on this Revised and Recirculated Draft EIR will be provided to the respective agency.

1.3 - EIR Scoping Process

In compliance with the CEQA Guidelines, the County of San Bernardino has taken steps to maximize opportunities to participate in the environmental process. During the preparation of the 2004 Draft EIR, an effort was made to contact various federal, State, regional, and local government agencies and other interested parties to solicit comments and inform the public of the proposed project. This included the distribution of an Initial Study and Notice of Preparation (NOP), publication and posting of the NOP, and a Public Scoping Meeting that was held on March 2, 2002.

1.3.1 - Initial Study

In accordance with Section 15063(a) of the CEQA Guidelines, as amended, the County undertook the preparation of an Initial Study. The Initial Study determined that a number of environmental issue areas may be impacted by the construction and build-out of the project and that the 2004 Draft EIR should address the project's potentially significant impacts on a variety of environmental issue areas. These issue areas were addressed in Section 5.0, Description of Environmental Setting, Impacts and Mitigation Measures, of the 2005 Final EIR.

Based on the Initial Study, no impacts upon agricultural resources or mineral resources were anticipated to result from the proposed development. As a result, these issues were addressed in Section 10.0, Effects Found Not to be Significant, of the 2004 Draft EIR.

1.3.2 - Notice of Preparation

Pursuant to the provision of Section 15082 of the CEQA Guidelines, as amended, the County of San Bernardino circulated a NOP via newspaper publication and local posting to public agencies, special districts, and members of the public requesting such notice, for a 30-day period commencing February 21, 2002, and ending March 22, 2002. The purpose of the NOP was to formally convey that the County was preparing a Draft EIR for the Moon Camp Tentative Tract Map No. 16136 and General Plan Land Use Amendment, and that as Lead Agency, was soliciting input regarding the scope and content of the environmental information to be included in the EIR. The Initial Study was circulated with the NOP. The NOP, Initial Study, and comments received in response to the NOP are provided in Appendices 15.1 and 15.2 of the 2004 Draft EIR.

1.3.3 - Early Consultation (Scoping)

During the NOP circulation period, the County of San Bernardino advertised a public scoping meeting. The meeting was held on March 2, 2002, at the North Shore Elementary School at Big Bear Lake and was intended to facilitate public input. The meeting was held with the specific intent of affording interested individuals/groups and public agencies and others a forum in which to orally present input directly to the Lead Agency in an effort to assist in further refining the intended scope and focus of the Project EIR as described in the NOP and Initial Study.

NOP and Scoping Results

The specific environmental concerns raised by those who commented and responded to the NOP for the project were enumerated in Section 1.0, Introduction, of the 2005 Final EIR. The location within the document where these comments were addressed was also identified. The NOP responses, and written comments received at the meeting are contained in Appendix 15.2 of the 2005 Final EIR.

1.3.4 - 2005 Final EIR Findings of Significant Impacts

The 2005 Final EIR focused primarily on changes in the environment that would result from the proposed 92-lot residential subdivision, 100-slip marina, related infrastructure, and the realignment of SR-38. The EIR identified potential impacts that could result from the construction and operation of the Original Proposed Project and provided measures to mitigate potential significant impacts. Those impacts that would remain significant and unavoidable after implementation of all feasible mitigation measures were also identified. They are as follows:

Aesthetics/Light and Glare

Significant and unavoidable impacts related to Aesthetics/Light and Glare were identified for viewshed alterations involving existing residents to the north, east and west of the project site. Additionally, significant and unavoidable impacts were identified for views from SR-38, a scenic highway, to the south and from the south shore of Big Bear Lake.

Air Quality

Air quality impacts that would remain significant and unavoidable following mitigation were the following:

- **Construction Activities:** Reactive Organic Gases (ROG) and Nitrogen Oxides (NO_x) emissions during site preparation and construction from equipment and vehicles would be significant in the short-term; and
- **Project Operations:** Long-term use of the project site would result in an overall increase in the local and regional pollutant load due to direct impacts from vehicle emissions, and indirect impacts from electricity and natural gas consumption. Combined mobile and area source emissions would exceed South Coast Air Quality Management District (SCAQMD) thresholds of ROG, carbon monoxide (CO) and 10 micron or less particulate matter (PM_{10}).

Biological Resources

Project implementation would affect species identified as special status. Implementation of recommended mitigation measures would reduce impacts to less than significant levels with the exception of the bald eagle. Impacts to this species were considered significant and unavoidable due to short-term construction noise and long-term residential noise, as well as the removal of potential perch trees.

Hydrology and Drainage

Due to inconclusive testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit, project and cumulative impacts were considered significant and unavoidable.

Public Services and Utilities

Due to the inability of water providers to confirm service to the project, the impacts of the Original Proposed Project as well as cumulative impacts on public services and utilities were considered to be significant and unavoidable. This conclusion was further supported by the significant and unavoidable conclusion cited in Section 5.11, Hydrology and Drainage, due to inconclusive testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit.

Revised Project Description

The findings of the 2005 Final EIR indicated that there would be a number of project-related impacts that remained significant and unavoidable. Subsequent to the distribution of the 2005 Final EIR, and partially in response to public comments received on the document, the Applicant made the decision to look at additional alternatives that would reduce the impacts that remained significant and unavoidable and to address other concerns raised in comments received on the 2004 Draft EIR. Table 1-1 of this Revised and Recirculated Draft EIR shows a brief comparison between the Original Proposed Project and the Proposed Alternative Project. Please refer to Section 2, Project Description, for a complete discussion.

Table 1-1: Comparison between the Original Proposed Project and Proposed Alternative Project

	Original Proposed Project	Proposed Alternative Project	Change
Site Size	62.43 acres	62.43 acres	No change
Proposed General Plan Designation*	BV/RS-1 (residential-minimum 7,200 sf lots)	BV/RS-20M (residential-minimum 20,000 sf lots)	Approx. 6 du/ac to less than 2 du/ac
Number of Lots	95	57	- 38
Residential Lots	92	50	- 42
Lettered Lots	3	7	+ 4
	Lot A – proposed private street designed to provide access to the southernmost lots (lakefront sites)	Lot A – 4.91-acre Open Space/Conservation (OS/C) easement to preserve Pebble Plain habitat	4.91 acres of Open Space for habitat conservation
	Lot B – a 1.4-acre strip of land between State Route 38 and the private street south of the highway	Lot B – 0.82-acre/891 lineal feet strip of land to remain OS/C between State Route 38 and the lakefront for open space and aesthetics	0.82 acre / 891 lineal feet of Open Space for neighborhood access and preservation of lake views
	Lot C – a gated entrance, south of State Route 38, a parking lot and access to the marina	Lot C – 2.90-acre strip of land to be used as an HOA parking lot and boat launch and open space	Similar size of area and proposed uses
		Lot D, E and F – well sites	
		Lot G – reservoir site	Potential reservoir site
Common Areas	Common areas within lettered lots would be maintained by a homeowner's association	Common areas within lettered lots would be maintained by a homeowner's association	No change
Marina/Boat Dock	103 boat slips on west side of the site	55 boat slips on the east side of the site	- 48 and relocation
Lakefront Lots	31 lakefront lots	No lakefront lots	- 31 lakefront lots
State Route 38	Realignment of State Route 38 to provide a straighter alignment and to provided lakefront residential lots	No change in the alignment of State Route 38	No realignment
Development Scenario	Lots would be sold individually and custom homes would be constructed by the individual property owners	Lots would be sold individually and custom homes would be constructed by the individual property owners	No change

* Current General Plan Designation is BV/RL-40 - Bear Valley Community Plan, Rural Living, minimum 40-acre residential lot size.

1.3.5 - 2007 Public Meeting on the Revised Project Description

Due to the amount of time between the public review of the 2004 Draft EIR and the substantial revisions to the Tentative Tract Map, the County provided an opportunity for the public to review the revised plans and provide comment on the Proposed Alternative Project. The forum was a local community meeting held on March 31, 2007. Prior to the meeting, a Notice of Community Meeting was published in the local newspapers and mailed to Responsible Agencies, nearby homeowners, and other interested parties.

The Community Meeting was held at 10:00 a.m. at North Shore Elementary School, located at 765 North Stanfield Cutoff, Big Bear Lake, approximately 2 miles from the project site. In addition to providing comments at the meeting, residents were given an additional two weeks to provide comments, in writing, to the County. Comments received at this meeting are enumerated within each section of the Revised and Recirculated Draft EIR. With this information, the County determined the scope of this Revised and Recirculated Draft EIR.

1.3.6 - Focus of the Revised and Re-circulated Draft EIR

Based on the comment letters received on the 2004 Draft EIR, the findings of the 2005 Final EIR and the applicants revised proposed project, the County determined that a Revised and Re-circulated Draft EIR must be prepared that would accomplish the following:

1. Conduct technical studies for the Proposed Alternative Project to update existing studies, particularly focused surveys for sensitive species and habitat; and water supply;
2. Evaluate the Proposed Alternative Project against the findings of the 2005 Final EIR for those impacts that remained significant and unavoidable impacts after mitigation measures have been implemented; and
3. Evaluate the Proposed Alternative Project in relation to the original proposed project and alternatives considered in the 2005 Final EIR.

The Revised and Recirculated Draft EIR focuses on the Proposed Alternative Project in light of the findings of the 2005 Final EIR regarding environmental issues where impacts remained significant and unavoidable, and in response to comments received at the 2007 public meeting. These are as follows:

1. **Aesthetics** - views of the site from adjacent residential uses and the state highway, and from the lake.
2. **Air Quality** - update air quality analysis to include consistency with 2007 Air Quality Management Plan (AQMP) and to address global climate change.
3. **Biological Resources** - conduct new surveys for sensitive species and to assess the pebble plain habitat on-site.

4. **Hydrology and Water Quality** - address potential water quality impacts to Big Bear Lake from runoff from the site.
5. **Land Use and Planning** - evaluate the Proposed Alternative Project using the 2007 General Plan and Development Code.
6. **Noise** - address construction noise and long-term residential noise from the project site.
7. **Public Services and Utilities** - address emergency evacuation of the site, provide an analysis of water supply and wastewater treatment.
8. **Traffic and Circulation** - update the traffic study to address revisions to the project's circulation plan and to capture the most recent cumulative projects in the vicinity.
9. **Cumulative Impacts** - evaluate potential environmental effects of the Proposed Alternative Project, in conjunction with other proposed or recently approved projects in the vicinity, that together could result in significant and unavoidable cumulative impacts.
10. **Alternatives** - evaluate the Proposed Alternative Project, comparing the potential environmental effects to the Original Proposed Project and other alternatives identified in the 2005 Final EIR.

This Revised and Recirculated Draft EIR does not include an additional evaluation of the impacts of the Proposed Alternative Project in the areas of Recreation, Cultural Resources and Geology and Soils. The 2005 Final EIR concluded that the Original Proposed Project analyzed therein would not result in any potentially significant impacts with regard to those specific environmental areas. Considering the Proposed Alternative Project represents a development that is less intense, compared to the Original Proposed Project analyzed in the 2005 Final EIR, the findings made in that document are adequate and show that the revised Proposed Alternative Project would similarly have less than significant impacts

1.4 - Authority under CEQA

CEQA Section 21002.1(a) states that "the purpose of an EIR is to identify the significant effects of a project on the environment, to identify alternatives to the Project, and to indicate the manner in which such significant effects can be mitigated or avoided."

This EIR does not express County policy about the desirability of the proposed project, but is an informational document to be used by decision makers, public agencies, and the general public in their review of the requested entitlements to develop the project. During the development review process, the County, as Lead Agency, must consider implementation of all feasible mitigation measures and alternatives developed to substantially lessen anticipated environmental impacts of the project. To that end, the Proposed Alternative Project represents an Alternative to the Original Proposed Project and should be reviewed within that context.

CEQA Guidelines Section 15088.5 discusses the requirements for the recirculation of an EIR prior to certification. Under subsection (a), "a lead agency is required to recirculate an EIR when significant new information is added to the EIR after public notice is given of the availability of the draft EIR for public review under Section 15087 but before certification." After reviewing the proposed revisions to the Moon Camp residential subdivision project, the County of San Bernardino determined that these revisions represent a new Alternative to the Original Proposed Project and that these revisions constituted significant new information that should be made public.

As indicated in Section 1.1.2, above, the Proposed Alternative Project analyzed in this Revised and Recirculated Draft EIR substantially differs from the Original Proposed Project that was analyzed in the 2005 Final EIR. The main revisions to the project are: (1) revision of Tentative Tract Map 16136 to provide for 50 residential lots instead of 92 residential lots; (2) elimination of the realignment of SR-38; (3) elimination of residential development south of SR-38; (4) creation of open space and neighborhood lakefront access areas; (5) relocation and reduction of the size of the Marina, and (6) increasing the minimum lot size from 7,200 square feet to 20,000 square feet.

Although the revisions significantly reduce the scope and intensity of development, and as discussed in detail in this Revised and Recirculated Draft EIR, significantly reduce and/or eliminate most of the significant environmental impacts identified in the 2005 Final EIR, the County has nevertheless determined that the identified project revisions constitutes significant new information, pursuant to CEQA Guidelines, Section 15088.5, requiring recirculation of the Draft EIR.

Therefore, in accordance with CEQA Guidelines Section 15088.5(a), the County has recirculated the Draft EIR, as revised. CEQA Guidelines Section 15088.5(c) states that, "if the revision is limited to a few chapters or portions of the EIR, the lead agency need only recirculate the chapters or portions that have been modified." Even though the affected chapters are identified in Section 1.3 above, San Bernardino County nevertheless is recirculating the entire EIR.

This Revised and Recirculated Draft EIR was prepared in compliance with the CEQA of 1970 (Public Resources Code §§ 21000 et seq.), and the CEQA Guidelines (California Code of Regulations (CCR), Title 14, §§15000 et seq.). As described in the CEQA Guidelines Section 15121(a), an EIR is a public information document that assesses potential environmental impacts of a proposed project and identifies mitigation measures and alternatives to the project that could reduce or avoid adverse environmental impacts. CEQA requires that state and local government agencies consider the environmental consequences of projects over which they have discretionary authority. It is not the purpose of the EIR to recommend approval or denial of a project. Rather, an EIR serves to provide full disclosure of potential environmental impacts of a proposed project for review and consideration by the Lead Agency.

1.5 - Determination of the Lead Agency and Responsible Agencies

CEQA requires that the agency with the broadest land use permitting authority over a private project should act as the Lead Agency in processing the EIR. The Moon Camp residential development project Tentative Tract Map and General Plan Amendment is proposed outside of any city boundaries, within the boundaries of the San Bernardino County; therefore, the County is the most appropriate authority to act as lead agency for this project. Additionally, other agencies may have authority over resources that may be affected by the project, or may be required to issue permits or give other input on implementation of the project. These are referred to as "responsible agencies" and "trustee agencies" and include the following:

- Big Bear Municipal Water District - A Dock System and License Agreement, Yacht Club Dock License, and/or a shore alteration permit can be obtained at their discretion.
- California Department of Fish and Game (CDFG) - 1602 Streambed Alteration Agreement.
- California Division of Forestry - Timber Harvest Plan approval.
- California State Water Resources Control Board -- General Storm Water Permit for Construction and Storm Water Pollution Prevention Plan.
- California Regional Water Quality Control Board (RWQCB) - Clean Water Act Section 401 Permit.
- California Department of Transportation - Project Study Report (PSR) and Traffic Impact Study (TIS) for SR-38 Encroachment Permit.
- City of Big Bear Lake, Department of Water and Power, or the County of San Bernardino Special Districts Department (CSA 53C) - water service permits and approvals.
- County of San Bernardino Special Districts Department (CSA 53B) - sewer service permits and approvals.
- South Coast Air Quality Management Agency – Authority to Construct/Operating Permits.
- U.S. Army Corps of Engineers (USACE) - Clean Water Act Section 404 Permit.
- U.S. Forest Service - Trustee Agency located in the vicinity of the Project Site.
- San Bernardino Associated Governments (SANBAG) - Regional agency.
- Southern California Association of Governments (SCAG) - Regional agency.

1.6 - Organization of the EIR

The Revised and Recirculated Draft EIR is organized as follows, and can be cross-referenced with information presented below.

Executive Summary: This revised section presents a summary of the proposed revisions to the Project Description for the Moon Camp Residential Development Project, which constitutes the Proposed Alternative Project to the Original Proposed Project, includes a table that summarizes potential environmental impacts associated with the Proposed Alternative Project, and identifies mitigation measures for any new impacts identified. It lists all mitigation measures recommended to reduce potentially significant environmental impacts associated with the Proposed Alternative Project.

Section 1 - Introduction: This revised section describes the purpose and organization of the EIR and how CEQA allows for the recirculation of a revised Draft EIR prior to certification.

Section 2 - Project Description: This revised section provides a detailed description of the revisions the Applicant has proposed to the design and density of the Moon Camp Residential Development Project.

Section 3 - Environmental Setting: This revised section outlines the existing environmental conditions of the Project area. This revised section describes the environmental setting for each topical area that must be revisited, evaluates the changes that may result from proposed revisions to the Original Proposed Moon Camp Residential Development Project, and identifies whether any changes may produce significant adverse environmental impacts. This revised section is limited to those issues identified above in Section 1.3.

Section 4 - Impact Analysis: This section explains the organization and evaluation process used in determining the environmental impacts.

Section 5 - Cumulative Impacts: The Cumulative Project List has been updated for this Revised and Recirculated Draft EIR and hence there is a new cumulative analysis for the Proposed Alternative Project.

Section 6 - Other CEQA Analysis: This revised section describes the significant environmental effects and irreversible environmental changes and describes the growth-inducing impacts associated with implementation of the Proposed Alternative Project.

Section 7 - Alternatives to the Proposed Alternative Project: This revised section provides a comparison between the Proposed Alternative Project and the Original Proposed Project and the Alternatives evaluated in the 2005 Final EIR.

Sections 8 and 9 - Report Preparation Sources and References: These revised sections outline the resources used in preparation of the Revised and Recirculated Draft EIR, including reports, organizations and persons consulted, and provide a list of all persons who directly participated in the preparation of the Revised and Recirculated Draft EIR.

Appendices: The Revised and Recirculated Draft EIR includes a compact disk (CD) at the back of the document that contains the 2005 Final EIR and technical studies that were used to prepare the environmental analysis for the proposed project. A second CD includes the technical studies prepared for this Revised and Re-circulated Draft EIR.

1.7 - Incorporation by Reference

Pertinent documents relating to this EIR have been cited in accordance with Section 15148 of the CEQA Guidelines, which encourages "incorporation by reference" as a means of reducing redundancy and length of environmental reports. The following documents, which are available for public review at the County of San Bernardino, are hereby incorporated by reference into this EIR. Information contained within these documents has been utilized for each section of this EIR. A brief synopsis of the scope and content of these documents is provided below:

- **County of San Bernardino General Plan, adopted March 2007.** The County of San Bernardino General Plan is the long-range planning guide for growth and development for the County of San Bernardino. The General Plan has two basic purposes: (1) to identify the goals for the future physical, social and economic development of the County; and (2) to describe and identify policies and actions adopted to attain those goals. It is a comprehensive document that addresses seven mandatory elements/issues in accordance with State law. These elements include Land Use, Housing, Circulation, Conservation, Open Space, Noise and Safety. Other optional issues that affect the County have also been addressed in the Plan. The County General Plan was utilized throughout this EIR as the fundamental planning document governing development on the project site. Background information and policy information from the Plan are cited in several sections of the EIR.

- **County of San Bernardino General Plan EIR, certified March 2007.** The purpose of the General Plan EIR, a Program EIR, is to provide basic analysis of the potentially significant effects on the human and natural environment that may occur during the implementation of the General Plan Update. The General Plan implementation program incorporates mitigation measures. However, project-specific impacts are assessed at the application stage. The General Plan Program EIR provides a fundamental base from which environmental review will occur.

  The most important feature of the General Plan EIR is its thresholds. The thresholds provide a commonly acceptable level for assessing project impacts on the environment. A project which has impacts below the threshold may be reviewed using the Mitigated Negative Declaration (MND) process. Projects which have impacts above the thresholds provide advance information allowing an applicant to submit the necessary information to determine if the impact can be mitigated through conventional means. If an impact cannot be mitigated through accepted practices, then normally, an environmental impact report for that project will be required.

- **County of San Bernardino Development Code, adopted March 2007.** The County Development Code provides the regulations which must be followed by every project within the County's jurisdictional area. Information within the Development Code was utilized in various sections of this EIR, particularly as it relates to the range of permitted uses within the BV/RS-20M designation (Single Residential, minimum 20,000 square foot lots) and for the identification of additional constraints and requirements that govern development.

1.8 - Project Sponsors and Contact Persons

The County of San Bernardino is the lead agency directing the environmental review of the proposed project. Preparers and contributors to this EIR are listed in Section 8, Report Preparation Sources. Key contract persons are as follows:

Project Applicant/Property Owner:
Tim Wood/RCK Properties,
P.O. Box 6820
Big Bear Lake, CA 92315

Lead Agency:
County of San Bernardino
Land Use Services Department
385 North Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415-0182
Phone: 909.387.4147
Mr. Matt Slowik, Senior Planner

Environmental Consultant:
Michael Brandman Associates
340 South Farrell Drive, Suite A-210
Palm Springs, CA 92262
Phone: 760.322.8847
Kerri Mikkelsen Tuttle, Branch Manager

1.9 - Public Review of the Revised/Re-circulated Draft EIR

This document is being recirculated to state, regional, and local agencies and to interested organizations and individuals that may wish to review and comment on the Revised and Recirculated Draft EIR. Publication of this Revised and Re-circulated Draft EIR marks the beginning of a 45-day public review period. Copies of the document are available for review at the following locations:

County of San Bernardino Public Library – Big Bear Lake Branch
41930 Garstin Drive
Big Bear Lake, CA 92315
909.866.5571
Hours: M-T 12-8, W-F 12-6, Sat 9-5, closed Sunday

County of San Bernardino Big Bear Office
477 Summit Boulevard
Big Bear Lake, CA 92315
909.866.1070
Hours: M-F 8-5

County of San Bernardino Land Uses Services Department
385 North Arrowhead Avenue, First Floor
San Bernardino, CA 92415
909.387.8311
Hours: M-F 8-5
Or online at: www.co.san-bernardino.ca.us/landuseservices.

The County will receive written comments on the Revised and Recirculated Draft EIR during this 45-day public review period. Written comments received in response to the Revised and Recirculated Draft EIR will be addressed in the Final EIR and Responses to Comments. The County's Planning Commission and Board of Supervisors will review the documentation, including the Final EIR, County of San Bernardino staff recommendations, and public testimony, to decide whether to certify the EIR and approve the Proposed Alternative Project.

SECTION 2: PROJECT DESCRIPTION

2.1 - Project Location and Setting

The proposed 62.43-acre Moon Camp project site is located on the north shore of Big Bear Lake, in the unincorporated community of Fawnskin, County of San Bernardino (refer to Exhibit 2-1, Regional Location, and Exhibit 2-2, Local Vicinity). The Big Bear Lake area is primarily a resort community where a major portion (approximately two thirds) of the residences are second homes. The south shore contains commercial and recreational facilities, including ski areas, hotels and restaurants, within the incorporated City of Big Bear Lake. By comparison, the north shore area in the vicinity of the project is less populated and primarily residential, with a small commercial component westerly of the project site.

State Route 38 (SR-38), also known as North Shore Drive, provides access to the project site; the road actually transects the property. The project site is roughly bounded to the north by Flicker Road, to the south by Big Bear Lake, to the east by Polique Canyon Road, and to the west by Canyon Road. In the Township and Range nomenclature system, the project site is described as being located in the northern half of Section 13, Township 2 North, Range 1 West, San Bernardino Baseline and Meridian (SBBM). San Bernardino County parcel numbers for the site include Assessor's Parcel Numbers (APN) numbers 0304-082-04, 0304-091-12, 0304-091-22, and 0304-091-21. According to the legal description, the site includes Tracts 108, 109, 117 and 118, Township 14 South, Range 14 East, and SBBM. The study area is specifically located at coordinates 34.264 degrees latitude and 116.933 degrees longitude.

2.2 - Project Site Characteristics

In addition to SR-38, several dirt trails (generally associated with unauthorized off-road vehicle use) traverse the project site, which is located approximately 1 mile south of the Pacific Crest Trail; a trail that stretches between the US/Mexican border and the US/Canadian border. Site elevations range from approximately 6,744 feet above mean sea level (msl) at the lakeshore to 6,960 feet above msl at the northeast corner of the site. Individual slopes on-site range from 5 percent to 40 percent. Slope orientation is generally from north to south toward the lake, except for three natural ravines on the project site that contain eastern and western slopes. Vegetation and habitat types in the project area include open Jeffery Pine forest (with an average density of 44.4 trees per acre) and unique pebble plains habitat in the western portion, which is a priority for preservation according to the California Natural Diversity Database (CNDDB).

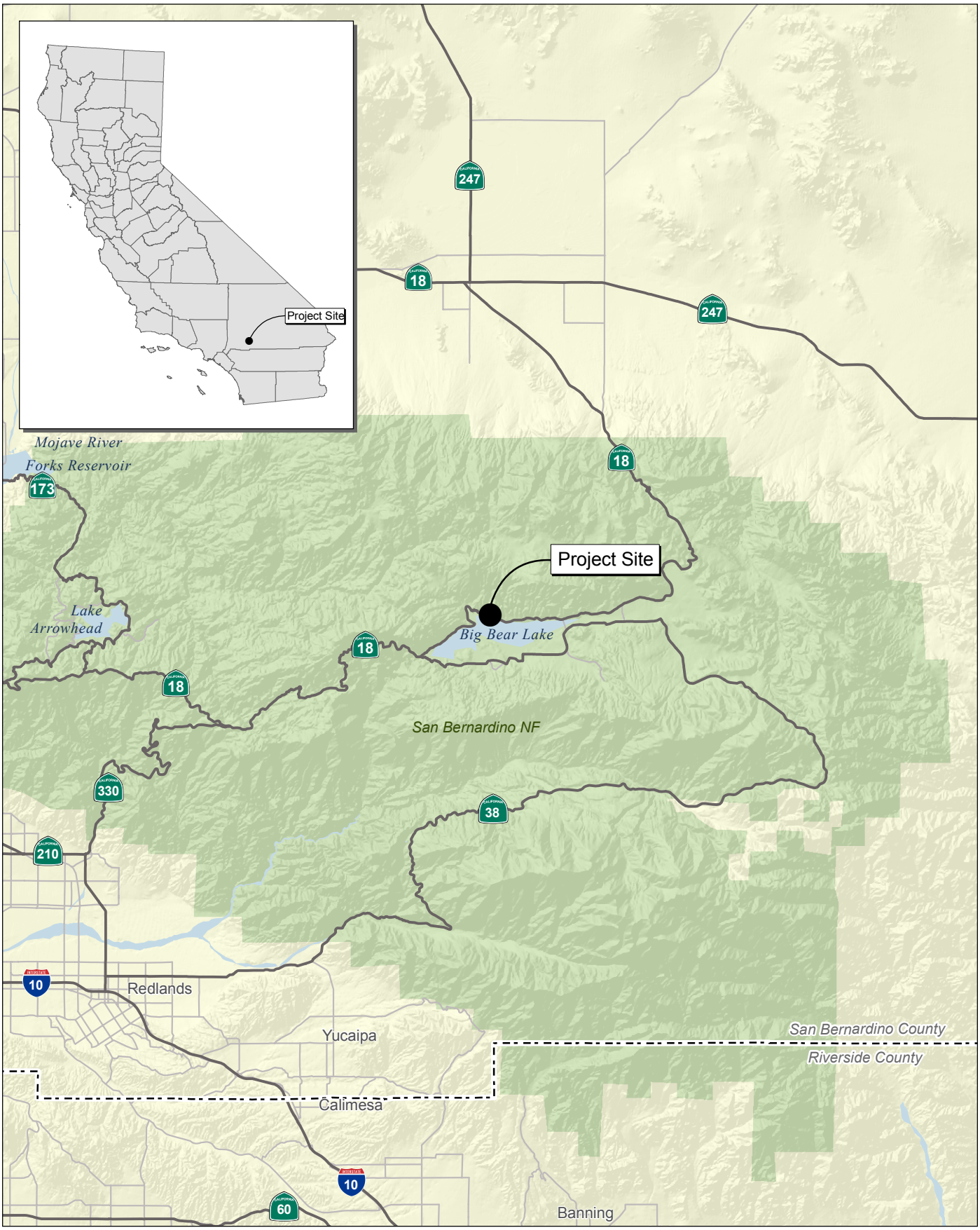
2.2.1 - Existing Land Use

The project site is currently undeveloped and is designated in the County of San Bernardino, Bear Valley Community Plan (BV) as Rural Living with minimum 40-acre lots (BV/RL-40) (refer to Exhibit 2-3, Land Use Designations). The RL-40 land use designation is identified as a "Holding

Zone" within the Bear Valley Community Plan, which states: future development proposals (such as Moon Camp) within the RL-40 designation will be considered based on a demonstrated ability to provide adequate infrastructure and maintain consistency with the goals and policies of the 2006 Community Plan. Table 2-1, Existing Land Use and Land Use Designations, identifies the land use category of the site and surrounding properties, as well as the current land use designations.

Table 2-1: Existing Land Use and Official Land Use Zoning District

Existing Land Use		Official Land Use Zoning District (Bear Valley Community Plan)
Project Site	Vacant	Rural Living (BV/RL-40). This district provides sites for open space and recreational activities, single-family homes on very large parcels and similar and compatible uses. Minimum parcel size is 40 acres; 1 dwelling unit per parcel. This is considered a holding zone designation in the Bear Valley Community Plan, which indicates that future General Plan amendments will be considered where specific development proposals within the RL-40 designation demonstrate an ability to provide adequate infrastructure to serve the development and maintain consistency with the goals and policies of the Bear Valley Community Plan.
North	Residential (N and NW), Forest (N and NE)	Residential (BV/RS). One dwelling unit per 0.25 acre and a minimum lot size of 7,200 square feet. US Forest Service administered land.
South	Big Bear Lake, Residential (SE)	Floodway (FW). Uses permitted at owners risk; minimum parcel size is 10 acres. Single Residential (BV/RS). Four dwelling units per acre, minimum lot size is 7,200 square feet.
East	Vacant, Residential (SE) Forest (N and NE)	Single Residential (BV/RS). One dwelling unit per 0.25 acre and a minimum lot size of 7,200 square feet. Resource Conservation (BV/RC). Minimum parcel size is 40 acres; 1 dwelling unit per parcel. US Forest Service administered land.
West	Vacant, Residential	Special Development (BV/SD-RES). Minimum parcel size 40 acres. This District provides sites for a combination of residential uses. Single Residential (BV/RS). Four dwelling units per acre, minimum lot size is 7,200 square feet.
Sources: Bear Valley Community Plan, 2007. County of San Bernardino Development Code, 2007.		



Source: Census 2000 Data, The CaSIL, MBA GIS 2009.

NORTH

5 2.5 0 5 Miles

Michael Brandman Associates

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Exhibit 2-1
Regional Location Map

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Source: National Agriculutre Imagery Program, San Bernardino County (2005).

NORTH

2,000 1,000 0 2,000

Feet

Michael Brandman Associates

Exhibit 2-2
Project Vicinity Map - Aerial Base

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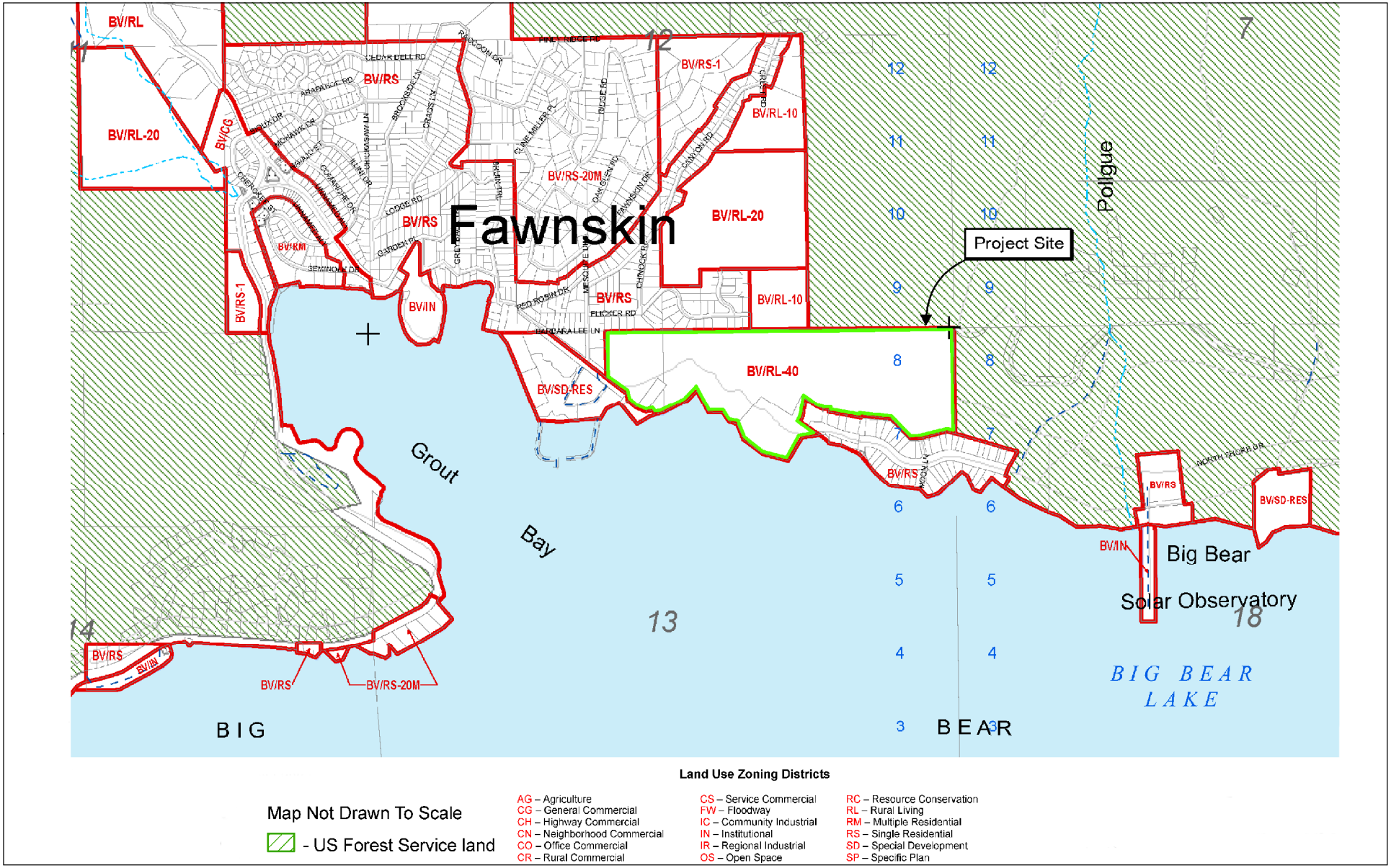
SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT



Source: San Bernardino County Land Use Plan GENERAL PLAN (2007).

Michael Brandman Associates

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Exhibit 2-3
Land Use Designations

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

2.2.2 - Site History

A marshy portion of the nearly flat Bear Valley was dammed in 1884 to provide a reservoir (Big Bear Lake) to retain irrigation water for release to the Redlands area of the eastern San Bernardino Valley. In 1912, a larger 72-foot multiple arch dam was constructed about 300 feet downstream of the old dam, increasing the lake capacity to 73,000 acre feet. Tourism in the area began with the onset of the automobile age and the eventual establishment of highways accessing the relatively remote area.

Maximum elevation at the lake surface is 6,744 feet above msl, but the actual level fluctuates according to annual snowmelt and runoff. The dam is owned by the Big Bear Municipal Water District. The lake has an east-west length of approximately 7 miles and is approximately 2.5 miles at its widest, though most of the lake's width averages a little more than 1 mile. Big Bear Lake measures 72 feet deep at the dam. It is completely rain- and snow-fed, having no other source of tributary or mechanical replenishment other than natural precipitation.

The Community of Fawnskin was founded in 1916, and by 1928, there were at least nine resort camps in the area, including Moon Camp, which was built in 1919. The project site has remained primarily vacant since destruction of the original camp in 1951. The current property owner purchased the marina permit along with the property in 1969. Site improvements currently include three water wells and SR-38, which transects the property from east to west.

In 2003, the Applicant proposed Tentative Tract Map No. 16136 for the subdivision of the approximately 62.43-acre site into 95 lots comprised of 92 residential lots and three lettered lots (Original Proposed Project). Exhibit 2-4, Moon Camp Tentative Tract Map No 16136 - Original Proposed Project, shows the configuration of the Project as originally proposed. Under the Original Proposed Project, a segment of SR-38 would be realigned in order to establish an area to develop lakefront residential lots. The three lettered lots are for private streets, a remainder strip of land between lakefront lots and the realigned segment of SR-38, and a gated entrance to the project. The 2005 Final Environmental Impact Report (Final EIR) determined that there were significant unavoidable impacts associated with the proposed project as follows:

Aesthetics/Light and Glare

Significant and unavoidable impacts related to Aesthetics/Light and Glare were identified for viewshed alterations involving existing residents to the north, east and west of the project site. The proposed 92 dwelling units would adversely impact existing views of the lake and surrounding mountain peaks from some existing adjacent residences. Additionally, significant and unavoidable impacts were identified for views from SR-38, a scenic highway, to the south and from the south shore of Big Bear Lake.

Air Quality

Air quality impacts that would remain significant and unavoidable following mitigation were:

- Construction Activities: Reactive Organic Gases (ROG) and nitrogen oxides (NO_x) emissions during site preparation and construction from equipment and vehicles would be significant in the short-term; and
- Project Operations: Long-term use of the project site would result in an overall increase in the local and regional pollutant load due to direct impacts from vehicle emissions, and indirect impacts from electricity and natural gas consumption. Combined mobile and area source emissions would exceed South Coast Air Quality Management District (SCAQMD) thresholds of ROG, carbon monoxide (CO) and 10 micron or less particulate matter (PM_{10}).

Biological Resources

Project implementation would affect species identified as special status. Implementation of recommended mitigation measures would reduce impacts to less than significant levels with the exception of the bald eagle. Impacts to this species were considered to be significant and unavoidable due to short-term construction noise and long-term residential noise, as well as the removal of potential perch trees, particularly in the westerly portion of the project site.

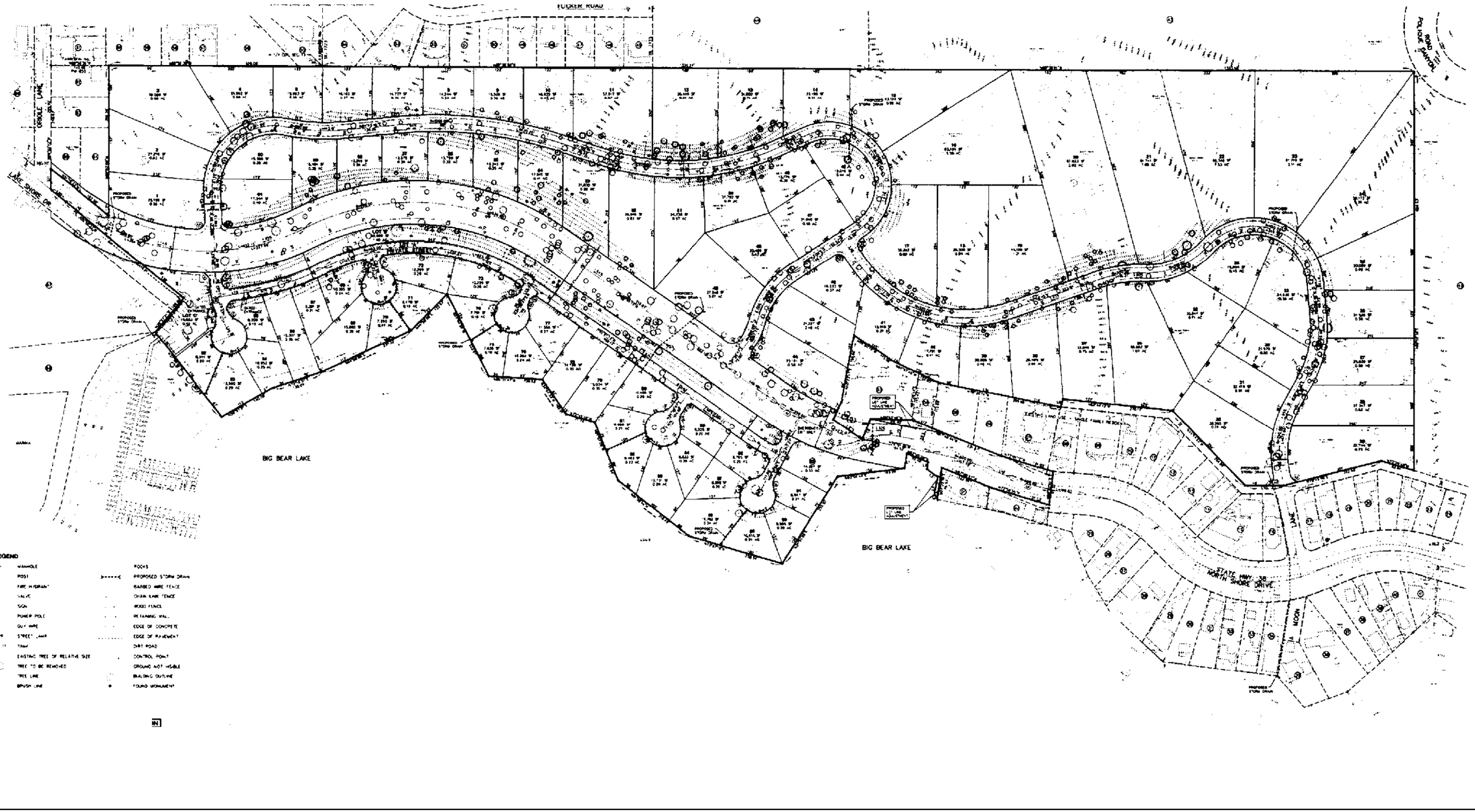
Hydrology and Drainage

Due to inconclusive testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit, the 2005 Final EIR concluded that the potential for the project to have an adequate water supply was uncertain. Accordingly, project and cumulative impacts were considered to be significant and unavoidable.

Public Services and Utilities

Due to the inability of water providers to confirm service to the project, the proposed project, as well as cumulative impacts, was considered to be significant and unavoidable. This conclusion was further supported by the significant and unavoidable conclusion cited in 2005 Final EIR Section 5.11, Hydrology and Drainage, due to inconclusive testing of potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit.

In response to comments on the 2004 Draft EIR and 2005 Final EIR, the Applicant developed a revised tract map to reduce the density and intensity of the project, which in turn, would likely eliminate or to the extent feasible, reduce the severity of the impacts identified as remaining significant and unavoidable after implementation of mitigation measures.



Source: Hicks & Hardwick, Inc.

Michael Brandman Associates

NORTH

Not to Scale

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Exhibit 2-4
Moon Camp TTM No 16136 Original Proposed Project

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

2.3 - Project Characteristics (Proposed Alternative Project)

The revised project description (Proposed Alternative Project) consists of the subdivision of the site into 57 lots—50 numbered lots (residential lots) to be sold individually and developed into custom homes; and seven lettered lots, two of which would be designated as Open Space/Conservation easements and Neighborhood Lake Access, three are well sites, one is a potential reservoir site, and one would be developed as the marina parking lot with a boat ramp. The marina parking lot also includes some open space for the preservation of existing trees; however, because of the development of the parking lot and boat ramp, the lot would not be considered Open Space. Exhibit 2-4, Original Proposed Project, and Exhibit 2-5, Proposed Alternative Project, are included herein and show the following differences between the plans:

- The Tentative Tract Map has been revised to reduce the number of residential lots from 92 lots to 50 lots by: (1) proposing larger lot sizes (minimum 20,000-square-foot lots – BV/RS-20M); (2) eliminating residential development along the shoreline; and 3) creating two distinct on-site conservation areas—one covering a portion of the shoreline south of SR-38 – to include neighborhood lake access, and the other encompassing the pebble plain habitat and bald eagle perches on the west end of the site. A third lettered lot consists of the parking lot/boat launch ramp, which also includes some open space, but because of the proposed use, cannot be referred to as Open Space/Conservation. Finally, there would be three lettered lots for the existing well sites and one lettered lot for the potential reservoir site. The Proposed Alternative Project also includes a 10-acre off-site Pebble Plain Conservation easement in the Sugarloaf area of Big Bear Valley that will be dedicated to a conservation management organization.
- The request for a General Plan Amendment has been revised to reflect the larger minimum lot size and to re-designate the site from BV/RL-40 (minimum lot size 40 acres) to BV/RS-20M (minimum lots size 20,000 square feet) instead of the original BV/RS (minimum lot size 7,200 square feet).
- The proposed marina has been moved from the lake shore near the west side of the site to the east side of the site, and the size of the marina has been reduced from 103 slips to 55 slips to reflect the proposed reduction in the number of residential lots to be developed. For the proposed marina parking lot, direct access from SR-38 is required, whereas under the Original Proposed Project, access to the marina parking lot was from private street A.
- The realignment of a segment of SR-38 has been deleted from the Proposed Alternative Project and no changes in the road configuration are now proposed. Because the road segment would not be realigned, the proposed removal of approximately 665 trees of the 2,772 trees identified on-site would not occur. The incidence of tree removal to develop lots would also be reduced because there are only 50 lots, versus the original 92 lots, and the larger lot sizes would allow home builders greater options in siting the homes to avoid trees. Although trees have been removed from the project site for fire safety/fuel reduction reasons, these tree removals are not related to the proposed development of the project.

- No direct access to SR-38 from individual lots is proposed. Access to individual lots would be from the proposed public streets (A and B). Also, with the deletion of residential lots south of SR-38, the need for five points of ingress/egress from the south side has been reduced to two (refer to Exhibits 2-4 and 2-5), to allow traffic through the marina parking lot to flow. Residents' access to the project site north of SR-38 has been reduced from three streets to two, with the third street shown on the original site plan now proposed to be used for emergency access only.

Infrastructure

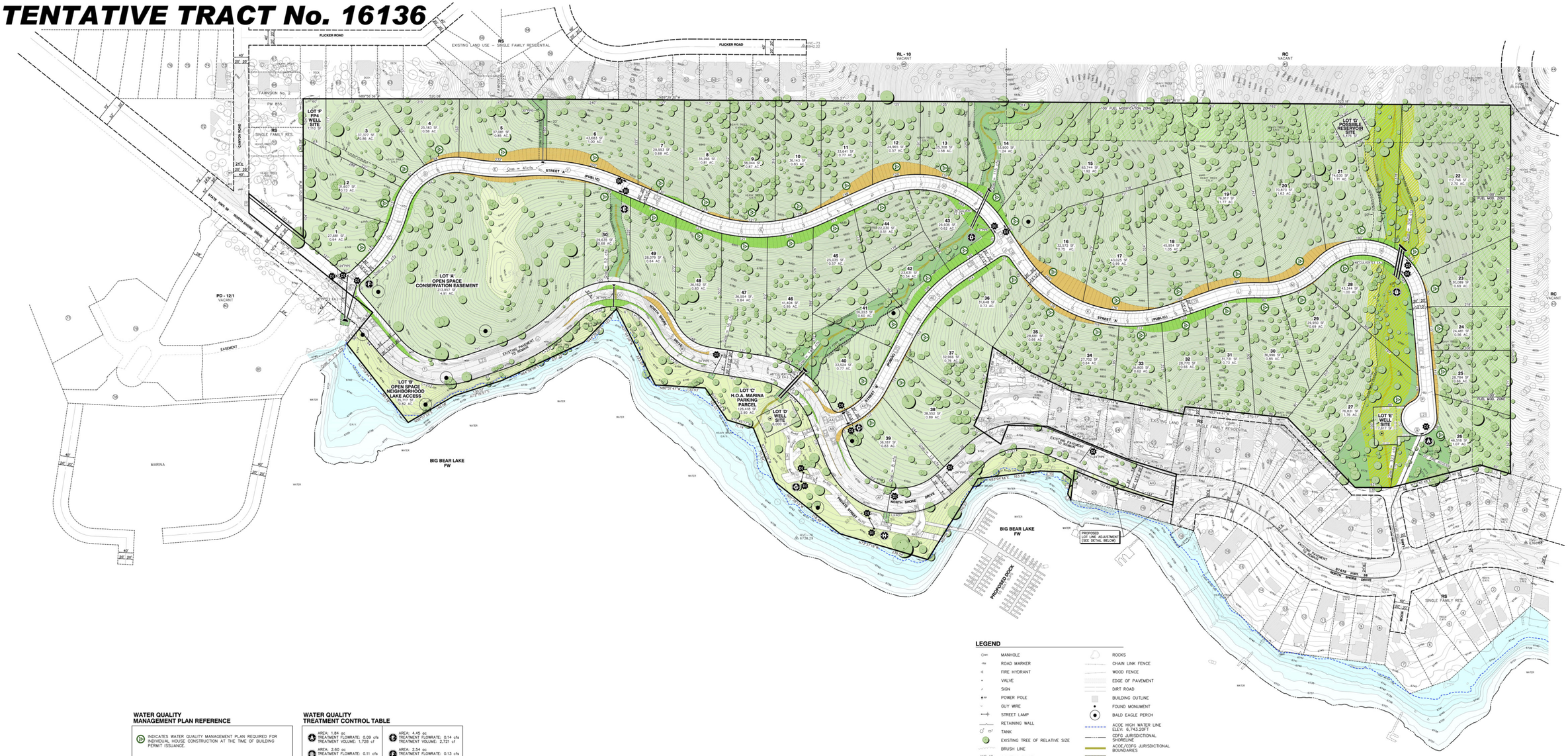
A water service feasibility study entitled "Final Feasibility Study to Serve the Proposed Moon Camp Residential Development (Tentative Tract Map No. 16163)," was prepared by Alda Engineering, Inc., in March 2007, to address issues raised in comments received on the 2005 Final EIR. In addition, the sewer feasibility study prepared by So & Associates was updated to reflect the revisions to the Moon Camp site plan. This study entitled, "County Service Area 53, Improvement Zone B (CSA 53-B) Updated Sewer Feasibility Study for APN's 0304-091-12, -21, -22, and 0304-082-04, TTM 16136 RCK Properties, Inc./Moon Camp," prepared April 11, 2007, and the water service feasibility study are included in this Revised and Recirculated Draft EIR in Appendix G.

Water Service

Although water service is not presently provided to the project site, the site is immediately adjacent to the Big Bear Department of Water and Power (DWP) and annexation to the DWP's authorized service area is one of three possible water service alternatives. DWP has conducted a Water Feasibility Study (Alda 2007), and provided a conditional will serve letter to the Applicant. However, the majority of the project site is outside of the DWP authorized service area as well as the City's Sphere of Influence. DWP cannot provide water service without first complying with the provisions of Government Code Section 56133, which pertains to the Local Area Formation Commission (LAFCO) annexation process. In order for the DWP to provide water service to the project site and to own and operate the Proposed Alternative Project's water system, LAFCO would have to approve an expansion of the City of Big Bear Lake's Sphere of Influence to include the entire existing DWP Water Service Area in Fawnskin as well as the entire project site. The developer would be required to construct the on-site and off-site facilities as described in the DWP's Water Feasibility Study (Alda 2007). This is Water Service Alternative #1 (see Section 4.9 for details).

Significant transmission improvements in the Fawnskin system would be needed to provide fire flow to the project site. Individual pressure regulators would be required for all lots with static pressures exceeding 80 psi. The future home owners would install and fund the individual pressure regulators as required for specific lots. Currently there are three groundwater wells on-site (constructed by the project's property owner and developer), Wells FP2, FP3 and FP4. Alternative #1 involves wells FP2, FP3, and FP4 being deeded to the DWP at the time the tract map is recorded.

TENTATIVE TRACT No. 16136



WATER QUALITY MANAGEMENT PLAN REFERENCE

(D)	INDICATES WATER QUALITY MANAGEMENT PLAN REQUIRED FOR INDIVIDUAL HOUSE CONSTRUCTION AT THE TIME OF BUILDING PERMIT ISSUANCE.
(A)	INDICATES WATER QUALITY MANAGEMENT PLAN APPROXIMATE BMP TREATMENT CONTROL LOCATION WITH BMP AREA, TREATMENT CONTROL VOLUME, AND TREATMENT CONTROL FLOW RATE. TREATMENT CONTROL INSTALLED WITH STREET IMPROVEMENT CONSTRUCTION.

WATER QUALITY TREATMENT CONTROL TABLE

(A)	AREA: 1.84 ac TREATMENT FLOWRATE: 0.09 cfs TREATMENT VOLUME: 1,728 cf	(E)	AREA: 4.45 ac TREATMENT FLOWRATE: 0.14 cfs TREATMENT VOLUME: 2,721 cf
(B)	AREA: 2.60 ac TREATMENT FLOWRATE: 0.11 cfs TREATMENT VOLUME: 2,134 cf	(F)	AREA: 2.54 ac TREATMENT FLOWRATE: 0.13 cfs TREATMENT VOLUME: 2,502 cf
(C)	AREA: 2.38 ac TREATMENT FLOWRATE: 0.14 cfs TREATMENT VOLUME: 2,689 cf	(G)	AREA: 0.34 ac TREATMENT FLOWRATE: 0.04 cfs TREATMENT VOLUME: 834 cf
(D)	AREA: 3.08 ac TREATMENT FLOWRATE: 0.13 cfs TREATMENT VOLUME: 2,416 cf	(H)	AREA: 0.36 ac TREATMENT FLOWRATE: 0.05 cfs TREATMENT VOLUME: 919 cf

LEGEND

- MANHOLE
- ROAD MARKER
- FIRE HYDRANT
- VALVE
- SIGN
- POWER POLE
- GUY WIRE
- STREET LAMP
- RETAINING WALL
- TANK
- EXISTING TREE OF RELATIVE SIZE
- BRUSH LINE
- CONTROL POINT
- GROUND NOT VISIBLE
- CUT SLOPE (1 1/2 :1 OR LESS)
- FILL SLOPE (1 1/2 :1 OR LESS)
- ROCKS
- CHAIN LINK FENCE
- WOOD FENCE
- EDGE OF PAVEMENT
- DIRT ROAD
- BUILDING OUTLINE
- FOUND MONUMENT
- BALD EAGLE PERCH
- ACOE HIGH WATER LINE ELEV: 6,743.20FT
- CDFG JURISDICTIONAL SHORELINE
- ACOE/CDFG JURISDICTIONAL BOUNDARIES
- RUBBER BOA AREA (100' WIDTH)
- STORM DRAIN EASEMENT
- STORM DRAIN STRUCTURE
- STORM DRAIN INLET
- CULVERTS (PRELIMINARY SIZE SHOWN)

Source: Hicks & Hartwick, Inc. (July, 2009).

NORTH

260 130 0 260 Feet

Michael Brandman Associates

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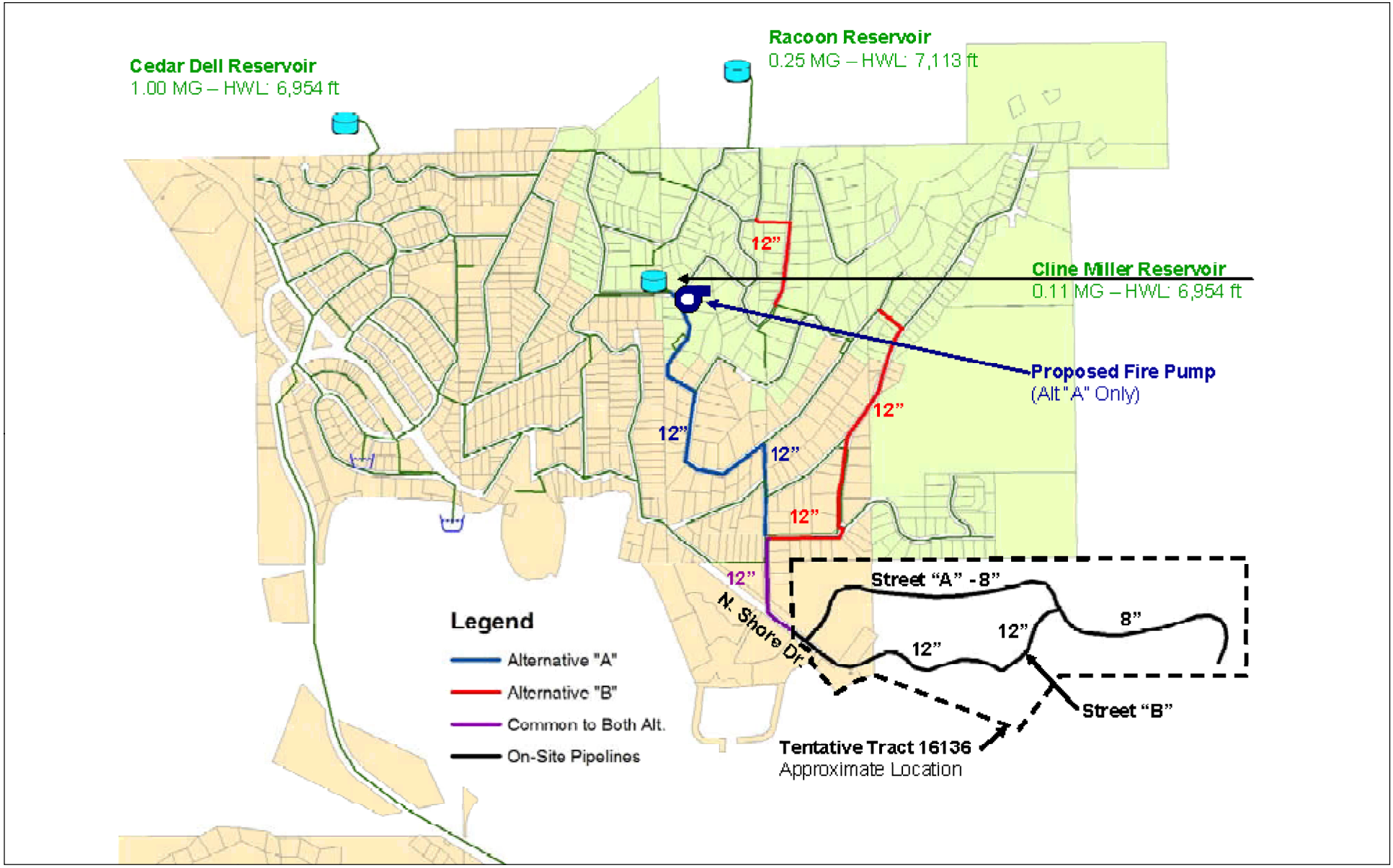
Exhibit 2-5
Moon Camp TTM No 16136 Proposed Alternative Project

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT



Source: ALDA Engineering Inc.

Michael Brandman Associates

NORTH

Not to Scale

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Exhibit 2-6
Proposed Water Facilities

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

The Water Feasibility Study provides two options (A and B) for expanding the existing Fawnskin Water System infrastructure. Option B has been chosen by DWP and the Applicant as the preferred Water Feasibility Study alternative for Water Service Alternative #1. In either case, the Applicant would install all common infrastructures, including fire hydrants, and would also install the water main lines within the project site. The water improvements will primarily occur within existing paved roads. Nearby residents are not required to tie into the proposed DWP water system. See Exhibit 2-6 for the proposed water facilities and improvements.

Water Service Alternative #2 (see Section 4.9 for details) would not require LAFCO's approval and would not create the expansion of the City's Sphere of Influence around Fawnskin and the project site. Instead, County Service Area 53C (CSA 53C) would own and operate the water facilities within the project site and contract with the DWP for a water interconnection to the existing Fawnskin water system. The developer would be required to construct the same on-site and off-site facilities as described in the DWP's Water Feasibility Study (Alda 2007). The water improvements for Water Service Alternative #2 would primarily occur within existing paved roads.

Under Water Service Alternative #3 (see Section 4.9 for details), instead of constructing the off-site water facilities (within the Fawnskin Water System) identified in the DWP's Water Feasibility Study Option B (Alda, 2007, which is the basis for Water Service Alternatives #1 and #2, above), the Proposed Alternative Project's developer would construct an on-site reservoir (238,600 gallons) and an on-site booster station capable of providing the daily water supply flow and the required 1,750 gallons per minute fire flow. The reservoir and booster station would be sized based upon the same demand calculations contained in the Water Feasibility Study and Water Service Alternatives #1 and #2. Water Service Alternative #3 would not require LAFCO's approval and would not create the expansion of the City's Sphere of Influence around Fawnskin and the project site. The developer would also construct the same on-site (within the project site) water facilities (water main lines, fire hydrants, etc) identified in the Alda Water Feasibility Study. Existing water wells FP2 and FP4 would be connected to the on-site water system and pump their water into the 238,600 gallon on-site reservoir. The on-site booster station would produce the Average and Maximum Daily Demand flows (8.68 gpm and 15.27 gpm) and the Fire Flow of 1,750 gpm for the 2-hour duration. The booster station would include an emergency electrical generator to allow the station to operate during a power outage. The water improvements for Water Service Alternative #3 will primarily occur within the Proposed Alternative Project's paved roads and at the Proposed Alternative Project's reservoir site. The construction of the reservoir would include grading an approximately 75-foot-diameter pad for the reservoir. CSA 53C would own and operate this independent water system.

Projected water demand for the proposed Moon Camp 50-lot subdivision (Proposed Alternative Project) is based on the Water Feasibility Study's consumption rate of 250 gallons per day (gpd) per connection. Exhibit 2-6, Proposed Water Supply Lines, shows the Water Feasibility Study's proposed Moon Camp water system. Maximum day demand is estimated based on information provided in the recently completed DWP Water Master Plan and it is equivalent to 1.76 times the

average day demand. Therefore, the average and maximum day demands for the Proposed Alternative Project are estimated as follows:

- Average Day Demand (ADD) = 12,500 gpd or 8.68 gpm
- Maximum Day Demand (MDD) = 15.27 gpm

Based on an estimated average day demand of 12,500 gallons, the annual water demand for the Proposed Alternative Project is estimated at 4.56 million gallons or 14.0 acre-feet per year.

Wastewater Service

The project site is located within County Service Area 53, Improvement Zone B (CSA 53B) administered by the County of San Bernardino Special Districts Department. The Sewer Feasibility Study indicated that the existing sewer system located adjacent to the project site to the southeast and southwest is capable of handling the wastewater flows from the Proposed Alternative Project.

The Applicant would be responsible for all plumbing and sewer facilities located within the site, including manholes and connection to the CSA 53B system at locations that have been approved by CSA 53B. Exhibit 2-7, Proposed On-site Sewer Facilities, shows the preliminary system. The Moon Camp developer would also be responsible for an off-site sewer extension of approximately 1,200 linear feet along North Shore Drive to connect to an existing CSA 53B collector sewer to the southwest of the property. This extension would accommodate the westerly lots; the easterly lots would be served by a gravity sewer extended to the existing CSA 53B Pump Station B to the southeast of the property. Depending upon where some of the houses are built, some lots may require a residential sewage pump station to transport the lot's sewage up to the sewer line in the street adjoining the property. The wastewater conveyance system on-site would be designed to accommodate these conditions and would be subject to review and approval by the County Special District's Engineer. In addition, regional connection fees would be imposed by the Big Bear Area Regional Wastewater Authority (BBARWA).

2.3.1 - Proposed Alternative Project Attributes and Design Features

The Proposed Alternative Project represents a reduced density alternative to the Original Proposed Project. A comparison of the attributes of the Original Proposed Project and the Proposed Alternative Project are presented above and summarized here. The Proposed Alternative Project would:

- Provide a 46 percent reduction in the number of residential lots that could be developed;
- Increase the minimum lot size and that could be developed on-site from 7,200 square feet to 20,000 square feet;
- Set aside approximately 5.73 acres of the 62.43-acre site as Open/Space Conservation, and a drainage easement;
- Set aside a 10-acre off-site Pebble Plain Conservation easement in the Sugarloaf area of Big Bear Valley that will be dedicated to a conservation management organization;

- Reduce the number of access points onto SR-38 by half from eight to four; and
- Relocate the proposed marina and reduce its size from 103 to 55 boat slips.

Design features built into this Proposed Alternative Project that would reduce the significant unavoidable impacts identified for the original proposed project in the 2005 Final EIR are presented here.

Aesthetics

1. View envelopes for the existing residences on properties adjacent to and the proposed residences on the project site are kept open to the greatest extent possible by reducing the number of lots by 46 percent and increasing the minimum lot size to one-half acre;
2. View corridors are established on-site across the areas to be set aside as Open Space/Conservation, including the entire lakefront area of the site, as well as along drainages that traverse the project site from north to south;
3. Conservation easements, Lots A and B located on the west side of the project site on either side of SR-38 would remain undeveloped open space. Although primarily intended for conservation of wildlife and vegetative resources, they also serve as preservation of visual aesthetics in their natural state. These lots would provide a buffer between the existing residences in Fawnskin, the proposed residential lots on the west side of the Moon Camp Project and the waterline of the lake.

Biological Resources

1. In addition to the proposed 5,73-acre pebble plain/eagle perch tree conservation easements in Lots A and B, the proposed alternative includes a drainage easement through lots 21, 22 and 26 through 29. This easement coincides approximately with a 100-foot wide area that is suitable for the southern rubber boa on-site. This drainage area and the rubber boa area identified on the site plan would not be developable and would remain a drainage feature and rubber boa area. Please note that focused intensive surveys for the southern rubber boa did not locate any occurrences of this species and the species was determined to have a low potential to occur on the project.

2. The Proposed Alternative Project also includes a 10-acre off-site Pebble Plain Conservation easement in the Sugarloaf area of Big Bear Valley that will be dedicated to a conservation management organization.

Cultural Resources

The Archaeological Survey Report prepared for the Original Proposed Project concluded that no historic resources requiring preservation were found on-site during the field survey; therefore, no specific Project Design Features have been identified.

Geology and Soils

The Original Proposed Project's Geotechnical Report included recommendations for developing the project site. No specific Project Design Features have been identified.

Hydrology and Drainage

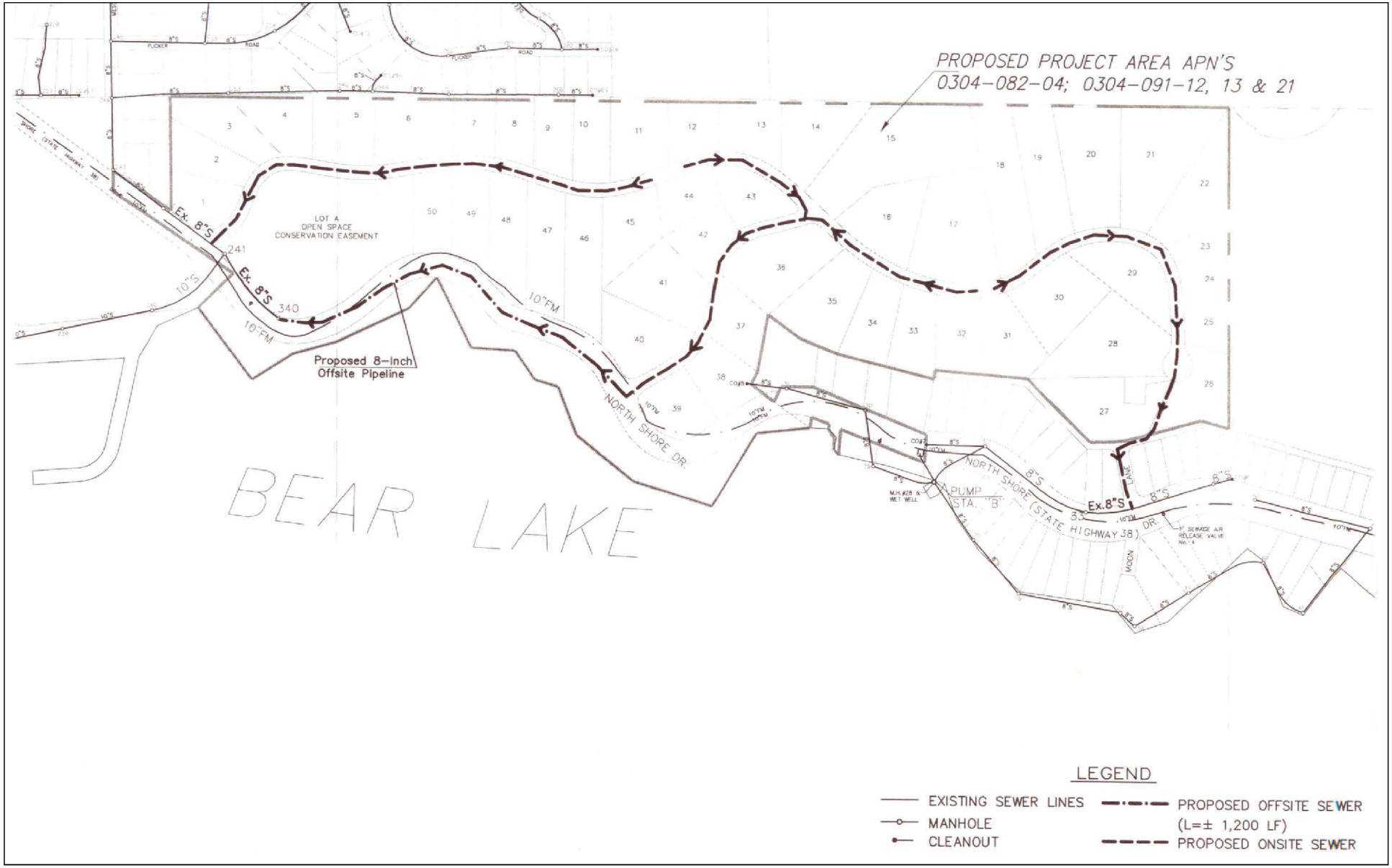
Existing Hydrological Conditions were described in detail in the 2005 Final EIR and have not changed. Storm water treatment under the National Pollution Discharge Elimination System (NPDES) Permit and the future Total Maximum Daily Load (TMDL) requirements shall include the construction of treatment Best Management Practices (BMPs). Treatment BMPs appropriate for on site use shall include infiltration trenches and basins, swales, inlet filtration, and/or water quality basins.

Land Use and Relevant Planning

1. Residences will be custom built by individual lot owners; the Applicant has indicated that lots will not be sold to "tract" homebuilders to develop as a large scale development. Individual lots have been laid out on the revised Alternative Tract Map to allow the design of future homes to individually fit on the slopes typical of the project site. As opposed to the 92 smaller residential lots identified in the Original Proposed Project with a minimum lot size of 7,200 square feet, the Proposed Alternative Project, with 50 residential lots, allows a minimum lot size of 20,000 square feet, with 22,120 (one-half acre) being the actual size of the smallest lot.

Noise

1. A 46 percent reduction in the number of residences proposed in this Proposed Alternative to the original project would reduce the duration of construction noise that would occur on-site.
2. Because the Original Proposed Project and Proposed Alternative Project both state that only custom homes would be built on-site and lots would not be sold to a developer to create a "tract" of houses, the Applicant estimates that it would take approximately 5-10 years to sell the individual lots and that based on similar projects in the Valley, it is likely to take 15 to 20 years for the 50 residences to ultimately be built. Therefore, the likelihood that a number of houses would be built simultaneously, thus increasing short-term noise during construction, is small.
3. The Applicant will prepare Conditions, Covenants, & Restrictions (CC&Rs) for the project that would preclude the short-term rental (less than 30 days) of residences.
4. A reduction in the number of boat slips in this Proposed Alternative Project would reduce the amount of noise associated with motor-driven boats docked at the marina.



Source: ALDA Engineering Inc.

Michael Brandman Associates

NORTH

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Exhibit 2-7
Proposed Sewer Facilities

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Public Services and Utilities

1. The Applicant will be responsible for developing the public infrastructure from public systems to each lot. This includes water lines (including fire hydrants), sewer lines, natural gas, electrical, telephone, and cable.

2. Although water service is not presently provided to the project site, the site is immediately adjacent to the jurisdiction of the DWP and annexation to the DWP's authorized service area is one of three possible water service alternatives. Under Water Service Alternative #1, in order for the DWP to provide water service to the project site and to own and operate the Proposed Alternative Project's water system, LAFCO would have to approve an expansion of the City of Big Bear Lake's Sphere of Influence to include the entire existing DWP Water Service Area in Fawnskin as well as the entire project site. The developer would be required to construct the on-site and off-site facilities as described in the DWP's Water Feasibility Study (Alda, 2007). Water Service Alternative #2 would not require LAFCO's approval and would not create the expansion of the City's Sphere of Influence around Fawnskin and the project site. Instead, County Service Area 53C (CSA 53C) would own and operate the water facilities within the project site and contract with the DWP for a water interconnection to the existing Fawnskin water system. The developer would be required to construct the same on-site and off-site facilities as described in the DWP's Water Feasibility Study (Alda, 2007). Water Service Alternative #3 would not require LAFCO's approval and would not create the expansion of the City's Sphere of Influence around Fawnskin and the project site. Alternative #3 would involve the developer constructing an independent water system completely within the project site. The developer would construct the same on-site water lines as in Water Alternatives #1 and #2, and, in addition the required water reservoir and water booster station would be constructed by the developer on the project site (rather than constructing the off-site water facilities identified in the DWP's Water Feasibility Study). CSA 53C would own and operate this independent water system.

Recreation

1. The Proposed Alternative Project includes a marina with 55 boat slips for residents, as well as a parking lot and boat launch.

2. The Proposed Alternative Project also includes the dedication of a 66-foot wide road easement for SR-38 that could be developed as part of the public multi-use trail system along the lakefront.

Traffic and Circulation

1. Parking – each residence would have at least a two-car garage with an additional two parking spaces in the driveway for guest parking. Parking for residences using the marina would be provided in the private/gated parking lot south of SR-38.

2. Access – access to the project site would be via two access points on the north side of SR-38 leading to the residences, and two access points south of SR-38 leading to/from the parking lot and boat launch.

3. Emergency Access – in addition to the aforementioned access points, a third access from SR-38 to the north side is shown on the site plan at the cul-de-sac between Lots 26 and 27. From these access points, residents would follow the emergency evacuation procedures for the Big Bear Valley, as discussed in Emergency Evacuation section of the Public Services Section.

2.4 - Project Phasing / Construction

The Applicant plans to put the entire tract infrastructure in place as part of a single phase of construction.

The exact details of each custom home would be evaluated by the County on an individual basis because the 50 lots would be sold individually and constructed when the purchaser is ready. The Applicant has indicated that like other similar tracts in the area, it is likely to take 5-10 years or more to sell the lots. Construction of individual homes would be intermittent and would likely occur over the next 20 years.

2.5 - Intended Uses of This EIR

This document is intended as an informational document for use in decision making by the County of San Bernardino and other responsible agencies, trustee agencies, and interested parties.

2.5.1 - Lead Agency

The County of San Bernardino is the lead agency in charge of approving this Proposed Alternative Project, and therefore has discretionary authority. The County Board of Supervisors will consider a General Plan Amendment to change the Land Use Designation from BV/RL-40 to BV/RL-20M, Conditional Use Permit for Marina and Parking Lot, Tentative Tract Map, and Certification of the Environmental Impact Report.

2.5.2 - Responsible Agencies

Agencies that are responsible for review of the Proposed Alternative Project and/or to issue permits include:

- LAFCO – Approval of a possible request for annexation of the DWP's Fawnskin Water Service Area and the project site into the City of Big Bear Lake's Sphere of Influence.
- Big Bear Municipal Water District – A Dock System and License Agreement, Yacht Club Dock License and/or a shore alteration permit.
- City of Big Bear Lake DWP and/or CSA 53C – Water service design approval and permits.

- County Service Area 53B – Sewer service design approval and permits.
- California Department of Fish and Game (CDFG) – 1602 Streambed Alteration Agreement.
- California Division of Forestry – Timber Harvest Plan approval.
- California State Water Resources Control Board – General Storm Water Permit for Construction and Storm Water Pollution Prevention Plan.
- California Regional Water Quality Control Board (RWQCB) – Clean Water Act (CWA) Section 401 Permit.
- California Department of Transportation – Project Study Report (PSR) and Traffic Impact Study (TIS) for SR-38 Encroachment Permit.
- SCAQMD – Authority to Construct/Operating Permits.
- U.S. Army Corps of Engineers (USACE) – CWA Section 404 Permit.
- U.S. Forest Service – Trustee Agency located in the vicinity of the project site.
- San Bernardino Association of Governments (SANBAG) – Trustee of interagency cooperation.
- Southern California Association of Governments (SCAG) – Trustee oversees regional housing needs and interagency cooperation.

SECTION 3: ENVIRONMENTAL SETTING

Big Bear Lake is located in the mountainous portion of San Bernardino County (see Exhibit 2-1, Regional Location Map). The Moon Camp Project is located on the north shore of Big Bear Lake, in the community of Fawnskin. The project site is bounded on the south by the lake and sparsely populated residential lakefront property, on the north by the San Bernardino National Forest and a residential area, on the west by a residential area, and on the east by the San Bernardino National Forest.

3.1 - Area Characteristics and Climate

Big Bear Lake experiences an alpine climate where the lake is at an altitude of 6,750 feet above mean sea level (msl). Winter months are characterized by snowstorms of varying intensity, but most days are cool and clear. Summers are mild and include occasional rainfall. The sun shines around 300 days a year. Average temperatures reach about 81 degrees in the summer and drop to around 20 degrees in the winter. Average annual precipitation is about 22 inches of rain and 62 inches of snow.

The project area is covered with Jeffery pine forest, from sparse to thick in concentration, and has small clearings with pebble plains. The forest does not have much understory vegetation in areas near the lake. Topography relief is primarily characterized by undulations carved by drainage, into a moderate slope rising away from the lake, but there are some slopes up to 40 percent.

3.2 - Existing Site Characteristics

The site, which occupies an area of 62.43 acres, is characteristic of the surrounding area. It supports a complement of wildlife and vegetation. As described in the original 2005 Final Environmental Impact Report (EIR), the project site consists of 62.43 undeveloped acres located along the north shore of Big Bear Lake on the eastern edge of the unincorporated community of Fawnskin (refer to the 2005 Final EIR, Exhibit 3.9-1, Local Vicinity). The site is bordered by Flicker Road on the north, Big Bear Lake on the south, Polique Canyon Road on the east, and Canyon Road on the west. The property is adjacent to the boundaries of the San Bernardino National Forest (USFS), which lies mostly to the north and east. The property requires no USFS permitting. State Route 38 (North Shore Drive/SR-38) traverses the southern portion of the property near the lakeshore.

3.3 - Land Use and Zoning

3.3.1 - Current Land Use Status

The 2005 Final EIR authored by RBF similarly addresses the current land uses on and off the project site, and the site has remained relatively undisturbed. Michael Brandman Associates' (MBA's) peer review of the biological studies included a site visit on December 15, 2006. During the site visit, the biologist observed that willow scrub habitat on the lake shoreline had grown up since the site was

studied in 2002. The willow scrub habitat could provide support for the sensitive species willow flycatcher. Additionally, the northern half of the project currently supports habitat suitable for flying squirrel species.

The site continues to be rural in character, and surrounding land uses are primarily vacant land owned by the USFS and by residential landowners. The site is currently zoned RL-40, or Rural Living 40 acre minimum lot size

3.3.2 - Surrounding Land Use and Zoning

Off-site, land uses involve a mix of resource conservation, floodway, and single-family residential. To the north, land use includes some County land zoned RC Resource Conservation (USFS land) and RS single-family residences along Flicker Road and Deer Trail Lane. On the south is Big Bear Lake and to southeast there are single-family residences along the shoreline of the lake on both sides of SR-38. To the west is also existing RS residential. To the east is USFS land.

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SECTION 4: PROJECT IMPACTS

As allowed by the California Environmental Quality Act (CEQA) Guidelines, only environmental topics which require further discussion, based on their relevance to the changes in the project description (i.e., changes from the Original Proposed Project to the Proposed Alternative Project), or at the request of the County of San Bernardino, are discussed in this Revised and Recirculated Draft Environmental Impact Report (EIR). These topics include Aesthetics/Light and Glare, Air Quality, Biological Resources, Hydrology and Drainage (including water quality), Land Use and Planning, Noise, Public Services (including water procurement), Traffic and Circulation, and Utilities. All other topics will be addressed as to the relevance and accuracy of the 2005 Final EIR.

The purpose of this Revised and Recirculated Draft EIR is to evaluate the potential environmental effects of the proposed Moon Camp project (Proposed Alternative Project) as is described in the Section 2, Project Description. Sections 4.1 through 4.9 of this EIR examine the potential environmental impacts associated with implementation of the Proposed Alternative Project. This analysis focuses on the following specific issues:

- Aesthetics/Light and Glare
- Air Quality
- Biological Resources
- Hydrology and Drainage
- Land Use and Planning
- Noise
- Public Services
- Traffic and Circulation
- Utilities

For each environmental issue in this section, the following subjects will be addressed:

Existing Conditions: This will contain a discussion of the existing conditions, services, and physical environment of the project site and vicinity as it relates to the topic. Specific references to literature or persons consulted during preparation of the Revised and Recirculated Draft EIR are indicated by their last name or firm acronym, with pages referenced to Section 8, Report Preparation Sources, or Section 9, References, as appropriate. The Existing Conditions section also indicates if or what comments were received from agencies or the public during circulation of the NOP.

Thresholds of Significance: Here we provide the environmental thresholds against which project impacts must be compared to determine whether an impact is significant. If locally established standards are not available, these criteria will be based on information from the CEQA Checklist, CEQA Guidelines, and/or other acceptable standards.

Project Impacts: This contains discussion of the impacts of the Proposed Alternative Project in qualitative and quantitative terms. The environmental analysis contained in this Revised and Recirculated Draft EIR uses the words “adverse” and “significant” in the discussion of potential environmental impacts. This section will also evaluate the Proposed Alternative Project’s consistency

with applicable General Plan goals and/or policies. The following adjectives are used specifically to define the degree of impact.

> An "**adverse**" impact is any negative result of the project, however small. As a disclosure document, the finding of an impact as "adverse" merely indicates that the project will cause an impact to increase by some less than significant level compared to existing conditions. For example, removal of healthy, non-native trees from a vacant site might be considered adverse (i.e., "negative") but it may not exceed a local threshold such as loss of native trees. Therefore, an impact may be adverse but it may not necessarily be significant (see below).
>
> A "**significant**" impact is considered a substantial negative effect, one that exceeds some critical and accepted threshold for negative environmental effects. CEQA defines a significant effect on the environment as "...a substantial, or potentially substantial, adverse (i.e., negative) change in any of the physical conditions within the area by the project, including land, air, water, flora, fauna, ambient noise, and objects of historic or aesthetic significance" (CEQA Guidelines, §15382). As recommended in the new CEQA Guidelines, impacts are also identified as "**potentially significant**" prior to mitigation.

Standard Conditions and Uniform Codes: The Proposed Alternative Project will incorporate, where necessary or required, the standard conditions and uniform codes as required by the County and/or other responsible agency, except for those identified by separate agreement. For analytical purposes, compliance with these regulatory requirements is not considered mitigation. Where an otherwise significant impact is avoided, in whole or in part, due to the application of standard regulatory requirements or project features, the text will note that an issue of environmental concern exists and that it is addressed by a standard regulatory requirement. This precludes the use of mitigation measures that are a mere repetition of common practice, county planning/approval procedures, or laws that are applicable to the Proposed Alternative Project regardless of the CEQA process. This allows the document to focus on substantive mitigation measures.

Project Design Features: Through the evolutionary process of developing the Proposed Alternative Project land use plan, certain features to avoid or minimize environmental impacts have been incorporated into the Proposed Alternative Project; these are referred to as "project design features."

Under each environmental issue area addressed in the Revised and Recirculated Draft EIR, all project design features that relate to the potential effects are clearly identified. To ensure implementation of project design features, these measures will be made conditions of project approval by the County. The County shall ensure compliance with all project design features through its standard procedures for the approval of permits and applications.

Mitigation Measures: These are measures to mitigate, avoid, or substantially lessen impacts identified as significant or potentially significant. For some impacts that have been identified as less

than significant, mitigation measures may be recommended to further lessen potential project impacts. As required by CEQA, this section will address all reasonably feasible mitigation measures that can reduce adverse impacts to below a level of significance. According to CEQA, the term "mitigation measures" refers to those items that are in addition to standard conditions, uniform codes, or project design features that may also reduce potential impacts. This section will also indicate if any of the proposed mitigation measures also have significant impacts.

Summary of Impact after Mitigation: An indication of whether or not any significant impacts remain following implementation of all reasonable and feasible mitigation measures.

Note that the cumulative impacts for each environmental topic are discussed in Section 5, Cumulative Impacts.

4.1 - Aesthetics

This section evaluates the potential impacts of the Proposed Alternative Project on scenic vistas or views and on any nearby scenic highways or corridors, and evaluates whether the Proposed Alternative Project would create a significant amount of light or glare in an area.

Visual resources are the natural and cultural features of the environment that can be seen by the public, and influence the aesthetic appeal an area may have for viewers. Visual resource impacts are normally associated with the visible contrast between proposed facilities and the existing elements of the surrounding landscape. They are especially important to areas where outdoor recreation draws tourism, as these places tend to also have unique natural resources which are enjoyed by people who specifically come to the area to experience these resources in their natural state.

The overall objective of this section is to describe existing landscape and visual resource conditions at the affected portions of the Proposed Alternative Project site and surrounding vicinity, to describe how changes in the Proposed Alternative Project have altered the effects to the aesthetic resources as compared to the Original Proposed Project, and to identify the impacts that could result from the implementation of the Proposed Alternative Project.

4.1.1 - Existing Conditions

The Moon Camp project site (Tentative Tract No. 16136) is located approximately midway along the north shore of Big Bear Lake, at the eastern edge of the Fawnskin Community. The 62.43-acre site slopes upward from the lakeshore and State Route 38 (SR-38) (Lakeshore Drive) from a lake surface elevation of approximately 6,747 feet above mean sea level (msl) to approximately 6,960 feet msl at the northeast boundary. Slopes vary from 5 to 40 percent and continue upward beyond the property to a ridgeline exceeding 7,800 feet msl on the north. The on-site variation in elevation is approximately 213 feet. The entire area is within a County of San Bernardino Scenic Resources Overlay, the purpose of which is to "provide development standards that will protect, preserve and enhance the aesthetic resources of the County."

The site is endowed with a variety of flora and fauna, including Jeffrey pine forest, pebble plain habitat, and numerous species of birds, mammals, reptiles, amphibians, and insects. Man-made modifications of the site include SR-38, three non-operational water wells, dirt roads, numerous footpaths and trails.

The Jeffery pine forest is moderately open (40-59 percent coverage) with scattered trees and very limited understory growth. A total of 2,772 trees with trunk diameters of 6 inches or more have been counted from aerial photographs. The understory growth consists of scattered chaparral shrubs and grasses. The overall visual effect is almost a park-like atmosphere rather than wild in nature. Houses and structures built on neighboring properties are also visible through the trees.

A small area (0.69 acre) of pebble plain habitat exists on a hillside near the western end of the project site. This endangered habitat consists of small cushion-forming plants, annuals, grasses and succulents that are well-spaced on a surface of clay soil mixed with pebbles and gravel. The area has been disturbed by unauthorized off-road traffic.

The lakeshore area nearest Big Bear Lake consists primarily of herbaceous species typical of saturated soils and several seeding cottonwood trees. Vegetation is patchy above the high-water level, where small stands of Jeffrey pine are interspersed with open meadows and grasslands and scattered patches of willow.

SR-38, which winds along the shoreline in an east-west direction through the site, has been designated by both the State of California and the County of San Bernardino as a "Scenic Highway." In addition, the U. S. Forest Service (USFS) has designated SR-38 as a "scenic byway." The meandering nature of the roadway paralleling the waterfront results in slower vehicle speeds and provides numerous vistas, through the trees, of the lake and surrounding mountains. At present, the roadway is narrow and there are few opportunities to park and view the lake.

Directly west and north of the site, along Canyon Road and Flicker Road, single-family homes are visible. Likewise, homes can be observed to the east and southeast of the site along SR-38 on both sides of the road. Views from Big Bear Lake toward the project site consist primarily of undeveloped lakefront and open pine forest and vacant land on gently sloping mountainside; however, at least a third of the site on the east lies behind the existing lakeshore residential development along SR-38.

Because the project site is currently undeveloped, there is no light or glare generated on the site. At night, headlights on vehicles traveling along SR-38 are visible on and off the site.

Scoping Meeting Comments

During the March 31, 2007, scoping meeting, questions and comments regarding aesthetics included the following:

- Will the building footprint and heights affect/impact views from existing neighboring homes?
- Address the proposed location of the marina and impacts to surrounding properties from light, noise, trash, and other issues.
- Will there be restrictions on building footprints?
- Address how 50 new homes will contribute to increased ambient noise and light in the vicinity.

Responses to these comments are included in the text of this section.

4.1.2 - Thresholds of Significance

The significance of potential aesthetic impacts was determined based upon the California Environmental Quality Act (CEQA) Guidelines (CCR §§ 15000-15387, Appendix G). The Proposed

Alternative Project would be considered to have a significant adverse aesthetic or visual impact if it were to result in any of the following:

- A substantial adverse effect on scenic vistas;
- Substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantial degradation of the existing visual character or quality of the site and its surroundings; or
- Creation of a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

4.1.3 - Project Impact Analysis

The impact analysis focuses on the degree to which the Proposed Alternative Project could directly or indirectly diminish or enhance the existing visual quality and character of the area from public viewing areas, such as SR-38 or Big Bear Lake.

Views

The Proposed Alternative Project differs substantially from the Original Proposed Project in the way it affects both the short range views and the long range views.

The views in the Original Proposed Project were significantly disrupted by the introduction of 31 residences to the lakefront and along the highway. These residences were highly visible from the lake, from the road, and in the view shed of existing residences situated above. In contrast, the Proposed Alternative Project has eliminated the lakeshore residences and a number of lots on the north side of the highway due to the introduction of almost 6 acres of open space conservation easements and a minimum lot size of one half acre. Another major difference between the Original Proposed Project and the Proposed Alternative Project is the removal of the highway realignment segment of the Original Proposed Project. The realignment would have dramatically affected the aesthetics, both by destroying the rural, undulating character of the scenic highway and by removal of significantly more trees to achieve the objective. Over 600 trees were spared with the elimination of the realignment feature.

View Looking West along Highway 38. Exhibits 4.1-1 and 4.1-2 show the view along SR-38 for existing conditions and simulated project conditions without a landscape buffer. The view is taken from the east side of the project as SR-38 enters the site. Lots 37, 38, and 39 are partially visible from this viewpoint. As indicated in the simulations, the lakeshore remains undisturbed. In this first impression of the project from the eastern approach, partial views of only 3 houses are visible in Exhibit 4.1-2. The winding configuration of SR-38 results in no more than 3 or 4 houses visible in one glance. Only 9 lots actually touch the SR-38 right-of-way and one third of the route through the site has no development on either side. With the eye drawn to the lake, the actual visual impression of added residential development will be relatively insignificant.

Views of the Marina. A principal visual alteration from the Original Proposed Project is the proposed marina, which has been reduced in size from the original 103 slips to only 55. The proposed marina will consist of roofless, floating docks that will be seasonally located at the site. During winter months, these floating docks will be stored off-site. The marina has also been relocated from the east to the west side of the project area. Relocation of the marina will result in less of an obstruction in the view from the existing residences in the most densely populated Fawnskin area, but will be more visible to the residences in the outlying areas where impacts are reduced by distance. Exhibit 4.1-3 is a view of the proposed marina site looking south from North Shore Drive towards the shoreline as it currently exists. Exhibit 4.1-4 is a simulated view of the proposed floating marina and associated parking and walkways looking south from North Shore Drive. Exhibit 4.1-5 is a "before" view of the marina site looking north from Big Bear Lake, and Exhibit 4.1-6 shows the simulated view of the marina in place with its associated boat launching ramp. As can be seen in these Exhibits, the proposed marina is a moveable floating facility with a low profile. The addition of boats in season will add dimension and height, but will also introduce color and interest to the shoreline. To the average recreationist, boats and activity are positive visual experiences.

Views from Flicker Road. The density of the units has been decreased in the Proposed Alternative Project and the units have been repositioned. As a result, the proposed lots are now arranged so that views of them are restricted to the area near the access roads, where one can look up the street and see houses but still experience the woodland. There would be very few houses visible from the water, as the shoreline set-back would give to homes within cover of the trees. With decreased density, the view of individual residences are also more open. Exhibits 4.1-7 and 4.1-8 illustrate the differences in the two projects (Original Proposed Project and Proposed Alternative Project) as seen from Flicker Road. Exhibit 4.1-7 demonstrates the Proposed Alternative Project with larger, more open lots. Exhibit 4.1-8 indicates the density of the Original Proposed Project. These exhibits demonstrate that views of the lake and SR-38 would be much more visible from the properties along Flicker Road with the revised / reduced density.

Views from Big Bear Lake. Perhaps the most significant visual difference in the Proposed Alternative Project is the elimination of all lakefront residential development south of SR-38. A visual simulation of the Proposed Alternative Project from the lake with and without development (as shown in Exhibits 4.1-9 through 4.1-10) demonstrates how much scenic vista has been preserved in the Proposed Alternative Project. The entire foreground south of SR-38 is relatively unaltered. Seen from a distance, development is very unobtrusive. With the addition of a landscape buffer, development will be minimally obtrusive even in the closer views, as demonstrated in Exhibit 4.1-10. The landscape buffer, coupled with the reduction of the overall density of the lots helps blend the sparse development into the trees and natural landscape.

Lighting

The Proposed Alternative Project would result in additional light sources during nighttime operation hours in an area where there are currently no sources of light. This project has the potential to affect both wildlife and the rural residential quality of the area. In order to diminish this effect, mitigation measures were introduced which include stricter control of light sources than provided by County ordinances. To minimize light pollution, lighting in the project area will be directed downward, be fully shielded and will be the minimum amount necessary for safe operations. Even with these measures, light pollution will remain an unavoidable impact, but at a greatly reduced level from the Original Proposed Project.

Temporary Impacts

Temporary impacts are generally associated with construction activities. The visual appearance of the site would be temporarily altered by grading and construction activity. The primary impact will be from construction of the access roads and improvement of SR-38. Since the residential lots will be sold for custom residences, construction activity on houses will be intermittent and individual. With custom housing lots, there is less likelihood of concurrent construction of multiple structures. Standard conditions and uniform codes help to preclude construction activities from causing excessive impacts, as they limit construction hours and impose dust and noise control measures. Additional mitigation measures were added to the 2005 Final Environmental Impact Report (EIR), including measures to locate the construction staging area away from the existing residential uses.

Summary of Impacts

Using the thresholds of significance identified in Section 4.1.2 above, aesthetic impacts are considered potentially significant. However, the Proposed Alternative Project would have substantially fewer aesthetic impacts than the Original Proposed Project. As mentioned previously, the attributes of the Proposed Alternative Project, including reduction in development intensity, elimination of the development of lakefront lots, elimination of the realignment of SR-38, reduction and relocation of the proposed marina, increase in permanently protected open space, and reduction in the number of trees removed from the site, enhance the aesthetic values of the project to reduce aesthetic impacts. With the implementation of Mitigation Measures A-1 through A-4, implementation of the Proposed Alternative Project would result in less than significant aesthetic impacts.

Level of Significance before Mitigation

Potentially Significant.

4.1.4 - Standard Conditions and Uniform Codes

As previously stated, the County of San Bernardino identifies the Moon Camp site within a Scenic Resources (SR) Overlay District and SR-38 as a County Scenic Highway. The State of California has also designated this portion of SR-38 as a "Scenic Highway," and the USFS has designated SR-38 as

a "scenic byway." The intent of the SR Overlay District is to "provide development standards that will protect, preserve and enhance the aesthetic resources of the County." The SR Overlay District also implements state and federal programs regarding scenic highway routes.

Provisions of the SR Overlay District apply to the following:

- Areas with unique views of the County's desert, mountain and valley areas or any other aesthetic natural land formations; and
- An area extending 200 feet on both sides of the ultimate right-of-way of State or County designated Scenic Highways as set forth in the County General Plan (the area may vary with vegetation and topography along the right-of-way).

According to the provisions of the SR Overlay District, the following development standards and criteria are used to evaluate compliance with the intent of the SR Overlay District:

- **Building and Structure Placement.** Placement of buildings and structures shall be compatible with and should not detract from the visual setting or obstruct significant views.
- **Review Area.** The proposed project shall be designed to blend into the natural landscape and maximize visual attributes of the natural vegetation and terrain. Project design should also provide for the maintenance of a natural open space, which should be visible from the right-of-way.
- **Access Drives.** Right-of-way access drives should be avoided.
- **Landscaping.** The removal of native vegetation, especially trees, shall be minimized and replacement vegetation and landscaping shall be compatible with the local environment and, where practicable, capable of surviving with a minimum of maintenance and supplemental water. Landscaping and plantings should not obstruct significant views, either when installed or when they reach maturity.
- **Roads, Pedestrian Walkways, Parking and Storage Areas.** Any large scale development should restrict the number of access points by providing common access road. Parking and outside storage areas should be screened from view to the maximum extent possible from a Scenic Highway, by the placement of buildings and structures, or by landscaping and plantings which are compatible with the local environment. Where practicable, landscaping plantings must also be capable of surviving with a minimum of maintenance and supplemental water.
- **Above Ground Utilities.** Utilities shall be constructed and routed underground except in those situations where natural features prevent the underground siting or where safety considerations necessitate above ground construction and routing. Aboveground utilities shall be constructed and routed to minimize detrimental effects on the visual setting of the designated area. Where it is practical, above ground utilities shall be screened from view of the Scenic Highway by existing topography, or by placement of buildings and structures.

- **Grading.** The alteration of the natural topography of the site shall be minimized and shall avoid detrimental effects to the visual setting of the designated area and the existing natural drainage system. Alterations of the natural topography should be screened from view from either the scenic highway or the adjacent scenic or recreational resource by landscaping and planting which harmonize with the natural landscape of the designated area and which are capable of surviving with a minimum of maintenance and supplemental water.
- **Signs.** Primary freestanding signs greater than 18 square feet are prohibited in the SR Overlay District.

General Plan Goals, Policies, and Actions

The San Bernardino County General Plan lists several Goals, Policies and Actions related to the Aesthetics for this project and they will be incorporated into the development plan for this project. In the February 2007 Final Program EIR it states that:

"Many of the vistas that have been deemed as 'scenic' are located along roadways, especially throughout the Mountain and Desert regions. To ensure the quality and character of these locations are not compromised through obtrusive development, improvements of any kind are subject to additional land use and aesthetic controls outlined under the County's Scenic Highway Overlay."

These controls include, but are not limited to, the following:

- Review of proposed development along scenic highways to ensure preservation of scenic values for the traveling public and those seeking a recreational driving experience.
- Expanding the established right-of-way of a designated Scenic Corridor to extend 200 feet to either side, measured from the outside edge of the right-of-way.
- Development along these corridors will be required to demonstrate through visual analysis that proposed improvements are compatible with the scenic qualities present.
- More restrictive sign ordinance standards regarding visual quality and size will be imposed.
- New development will be required to provide ample recreation and scenic opportunities along Scenic Corridors.
- Development will be restricted along prominent ridgelines and hilltops.
- Site plans will be reviewed to determine that specific architectural design, landscaping and grading are done to prevent obstruction of scenic views and to blend with surrounding landscape.
- Off-site advertising signs (i.e., billboards) will be prohibited within and adjacent to all scenic corridors.

4.1.5 - Project Design Features

The Proposed Alternative Project has included design features intended to reduce aesthetic impacts, which the Original Proposed Project did not incorporate. These include:

- View envelopes for the existing and proposed residences are kept open to the greatest extent possible;
- View corridors are established; and
- Conservation easements, LOT A and LOT B on the Tentative Tract Map, although primarily intended for conservation of wildlife and vegetative resources, also serve as preservation of visual aesthetics in their natural state. They provide a buffer between the existing residences in Fawnskin, the proposed residential lots on the west side of the Moon Camp Project, and the waterline.

4.1.6 - Mitigation Measures

The following mitigation measures were developed in the December 2005 Final EIR and are included and modified as a result of the reduced density and redesign of the Proposed Alternative Project:

Short-Term Aesthetic/Light and Glare Impact Mitigation

- **A-1a -** Construction equipment staging areas shall be located away from existing residential uses. Appropriate screening (i.e., temporary fencing with opaque material) shall be used to buffer views of construction equipment and material, when feasible. Staging locations shall be indicated on Project Grading Plans.
- **A-1b -** All construction-related lighting associated with the construction of new roadways, improvements to SR-38 and the installation of utilities shall be located and aimed away from adjacent residential areas. Lighting shall use the minimum wattage necessary to provide safety at the construction site. A construction safety lighting plan shall be submitted to the County for review along with Grading Permit applications for the subdivision of the lots.

Long-Term Aesthetic Impact Mitigation

- **A-2a -** All homes shall provide a two-car garage with automatic garage doors.
- **A-2b -** New development shall be subordinate to the natural setting and minimize reflective surfaces. Building materials including siding and roof materials shall be selected to blend in hue and brightness with the surroundings. Colors shall be earth tones: shades of grays, tans, browns, greens, and pale yellows; and shall be consistent with the mountain character of the area.
- **A-2c -** Outside parking/storage areas associated with the boat dock activities shall be screened from view by the placement of landscaping and plantings which are compatible with the local

environment and, where practicable, are capable of surviving with a minimum of maintenance and supplemental water.

- **A-2d**- Construction plans for each individual lot shall include the identification and placement of vegetation with the mature height of trees listed. Landscaping and plantings should not obstruct significant views, within or outside of the project, either when installed or when they reach maturity. The removal of existing vegetation shall not be required to create views.
- **A-2e** - A Note shall be placed on the Composite Development Plan stating that during construction plans review and prior to issuance of building permits for each lot, the building inspector shall refer to the Mitigation Monitoring and Compliance Program regarding these aesthetic impact mitigation measures. The building inspector shall coordinate with the Advance Planning Division the review and approval of building plans in relation to these aesthetic impact mitigation measures, prior to approval and issuance of building permits.

Long-Term Scenic Highway Impact Mitigation

- **A-3a** - Any entry sign for the development shall be a monument style sign compatible with the mountain character, preferably, rock or rock appearance.
- **A-3b** - Prior to recordation of the tract map (and/or any ground disturbance, whichever occurs first), landscaping or revegetation plans for lettered lots (A through D) shall be submitted to and approved by the San Bernardino County Land Use Services Department.

Long-Term Light and Glare Impacts

- **A-4a** - All exterior lighting shall be designed and located as to avoid intrusive effects on adjacent residential properties and undeveloped areas adjacent to the project site. Low-intensity street lighting and low-intensity exterior lighting shall be used throughout the development to the extent feasible. Lighting fixtures shall use shielding, if necessary to prevent spill lighting on adjacent off-site uses.
- **A-4b** - Lighting used for various components of the development plan shall be reviewed for light intensity levels, fixture height, fixture location and design by an independent engineer, and reviewed and approved by the County Building and Safety Division to ensure that light emitted from the proposed project does not intrude onto adjacent residential properties.
- **A-4c** - The project shall use minimally reflective glass. All other materials used on exterior buildings and structures shall be selected with attention to minimizing reflective glare.
- **A-4d** - Vegetated buffers shall be used along SR-38 to reduce light intrusion on residential development and on forested areas located adjacent to the project site. The vegetation buffers shall be reflected on the master landscape plan submitted to and approved by the County Land Use Services Department prior to the issuance of the first grading permit.

- **A-4e** - All outdoor light fixtures shall be cutoff luminaries and only high- or low-pressure sodium lamps shall be used.

- **A-4f** - Mitigation Measures A-4a thru 4e shall be included within the Conditions, Covenants, and Restrictions (CC&Rs) of the Home Owner's Association (HOA).

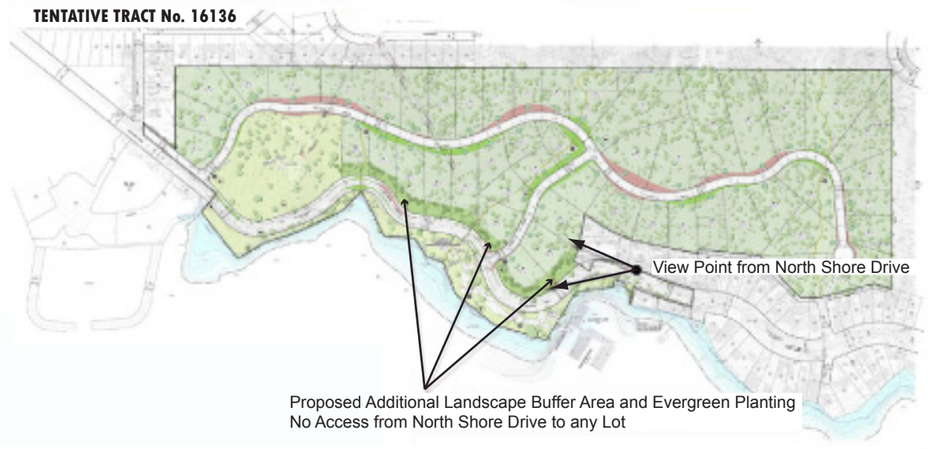
Cumulative Impact Mitigation

No mitigation measures are recommended for cumulative impacts.

No additions to the mitigation measures proposed in the 2005 Final EIR (as modified) are required.

4.1.7 - Level of Significance after Mitigation

Less than significant. The Proposed Alternative Project will permanently alter the aesthetics of the area near the lake and the scenic highway from natural open space to low density residential use. Implementation of mitigation measures along with standard conditions and CC&Rs will assist in blending this new neighborhood into the overall general character of the Fawnskin Community and reduce overall impacts to less than significant.



Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

NORTH

Not To Scale

Michael Brandman Associates

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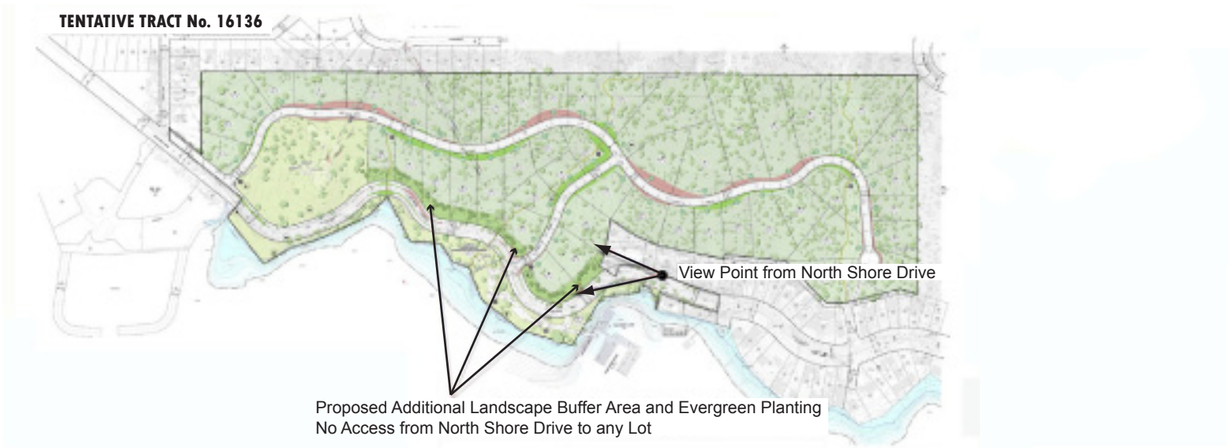
Exhibit 4.1-1
Existing View Looking West from North Shore Drive

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT



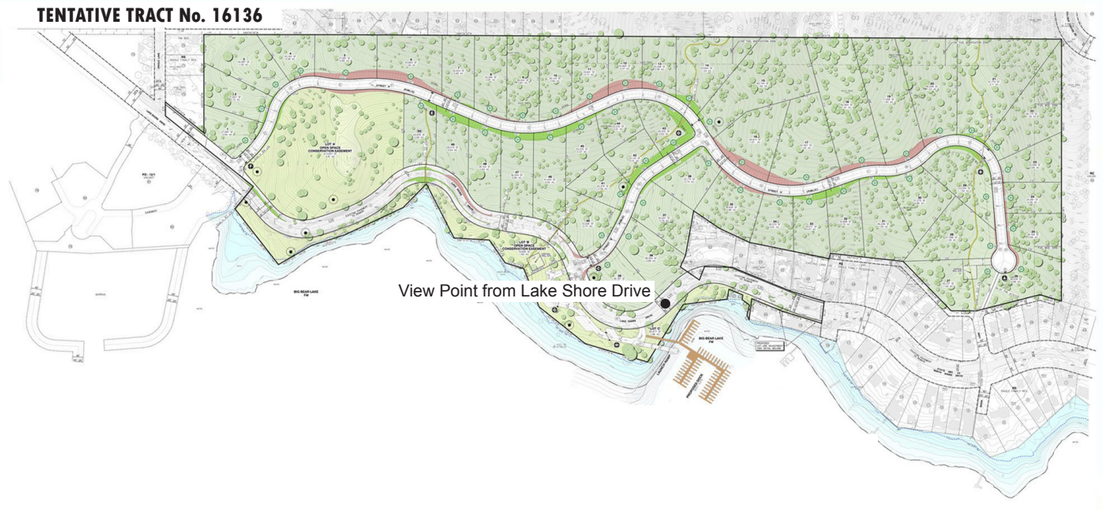
Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

NORTH

Not To Scale

Michael Brandman Associates

Exhibit 4.1-2
Simulated View Looking West from North Shore Drive



Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

NORTH

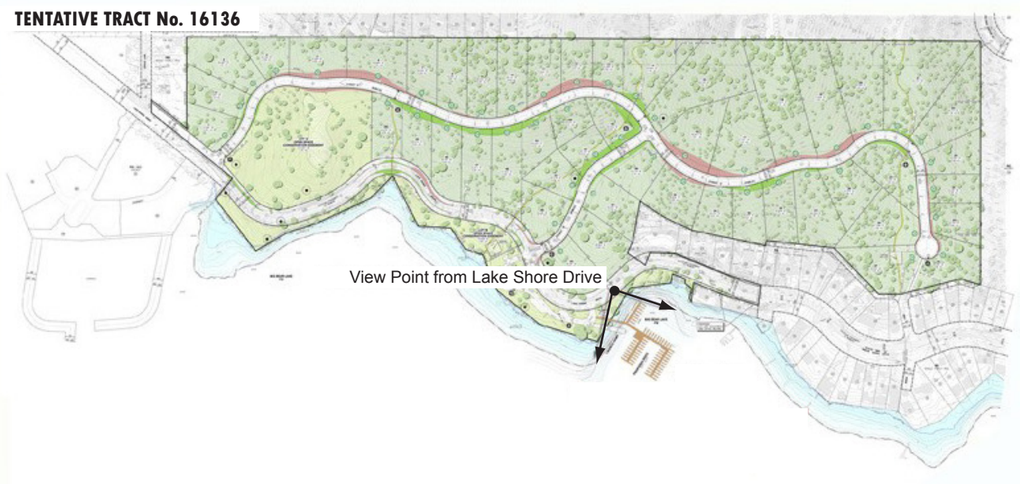
Not To Scale

Michael Brandman Associates

00520089 • 03/2010 | 4.1-3_Ex_View_Marina.ai

Exhibit 4.1-3
Existing View of Proposed Marina Looking South from North Shore Drive

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT



Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

NORTH

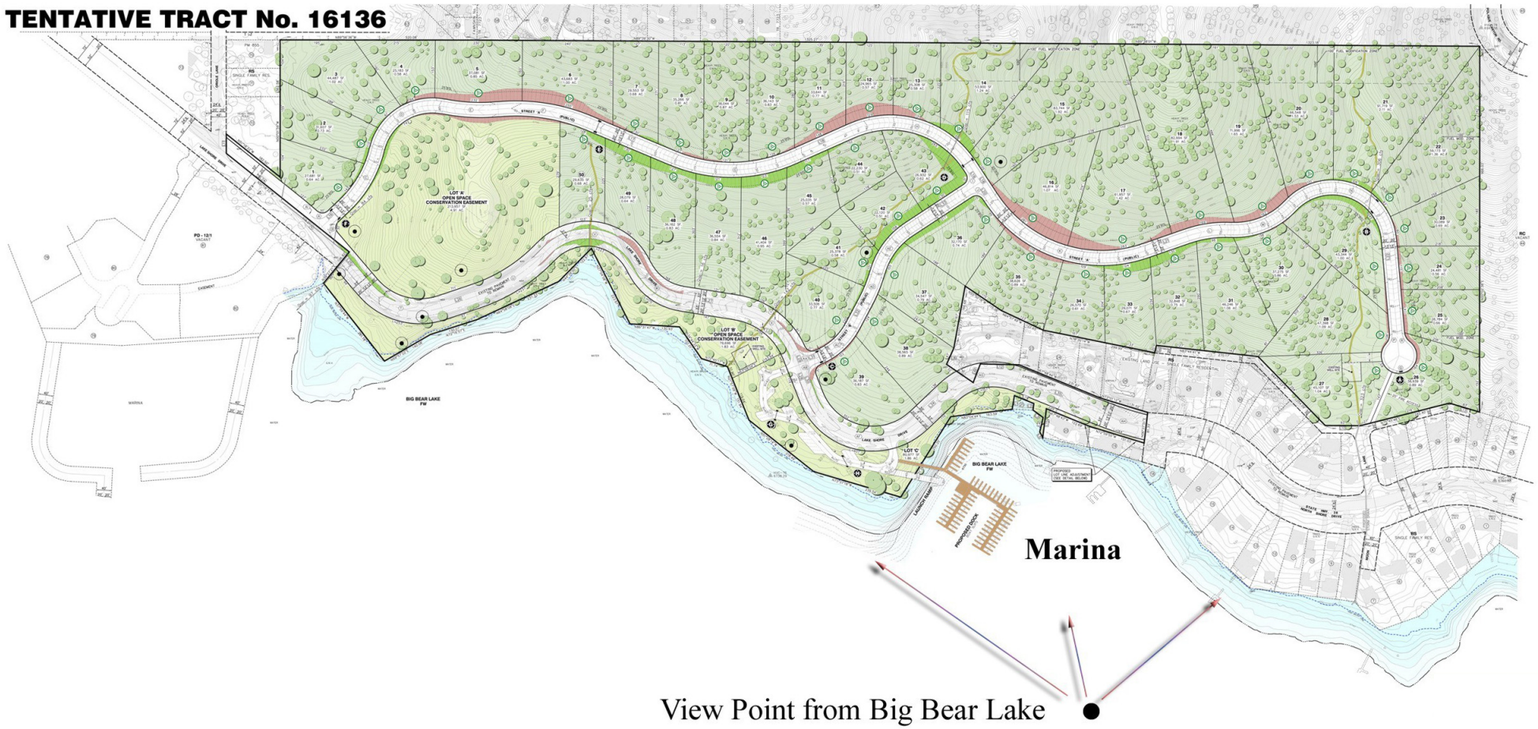
Not To Scale

Michael Brandman Associates

00520089 • 03/2009 | 4.1-4_Sim_View_Marina.ai

Exhibit 4.1-4
Simulated View of Proposed Marina Looking South from North Shore Drive

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT



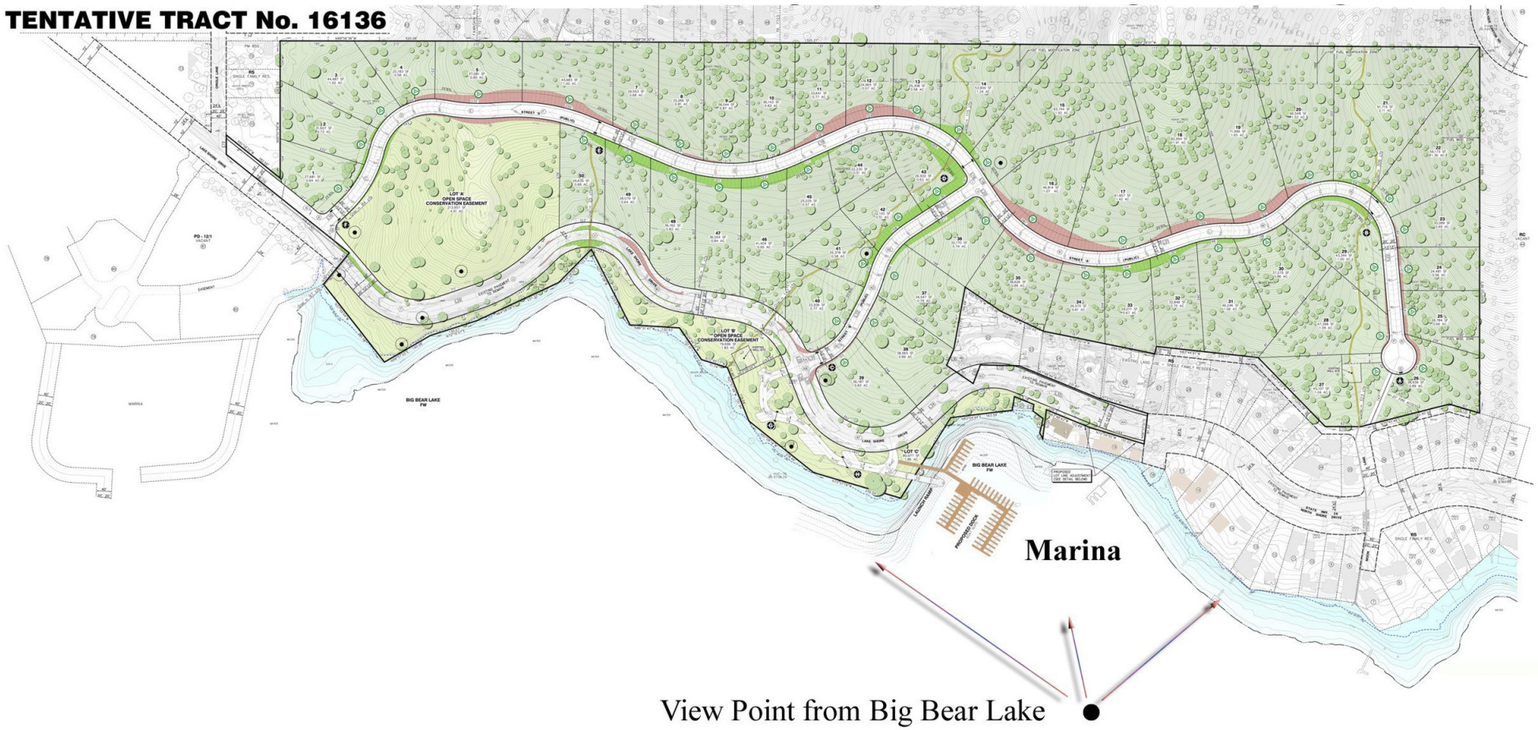
Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

Michael Brandman Associates

NORTH

Not To Scale

Exhibit 4.1-5
Existing View of Proposed Marina Looking North from Big Bear Lake



Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

Michael Brandman Associates

NORTH

Not To Scale

Exhibit 4.1-6
Simulated View of Proposed Marina Looking North from Big Bear Lake

Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

NORTH

Not To Scale

Michael Brandman Associates

Exhibit 4.1-7
Existing View Looking South from Flicker Road between Lots 53 & 54

LOT 53

LOT 54

Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

NORTH

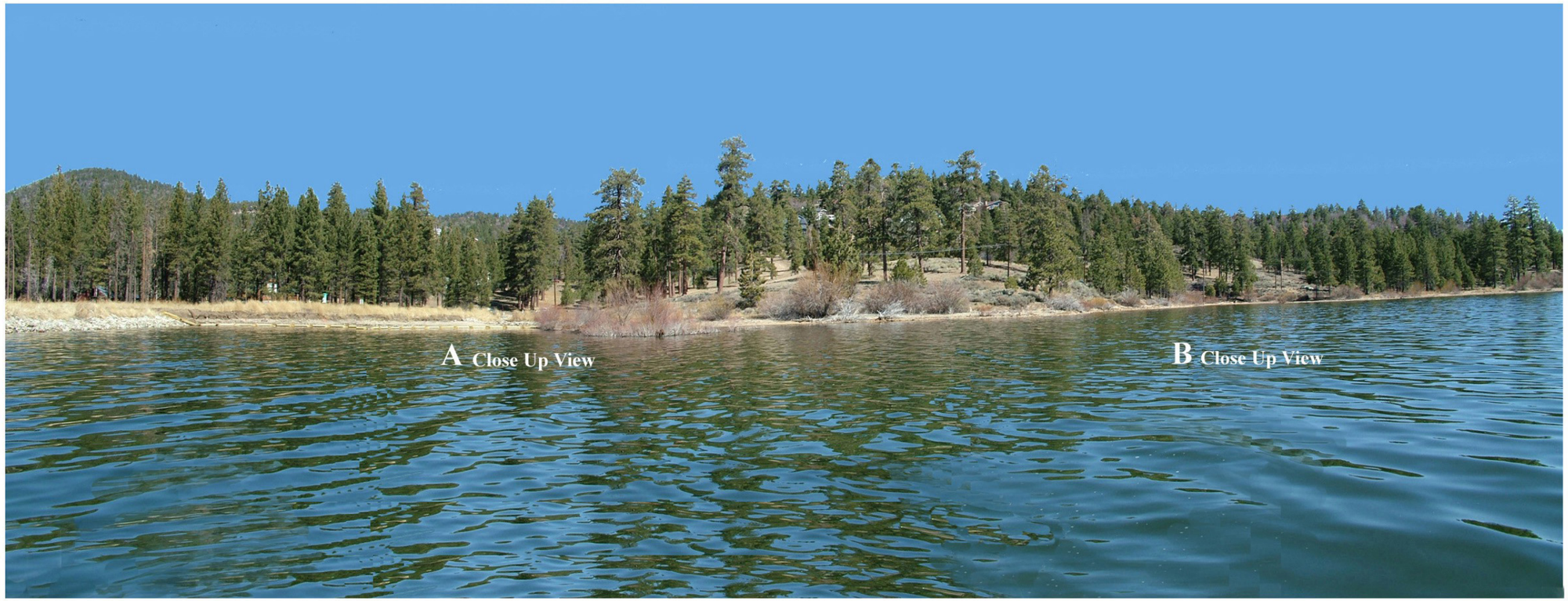
Not To Scale

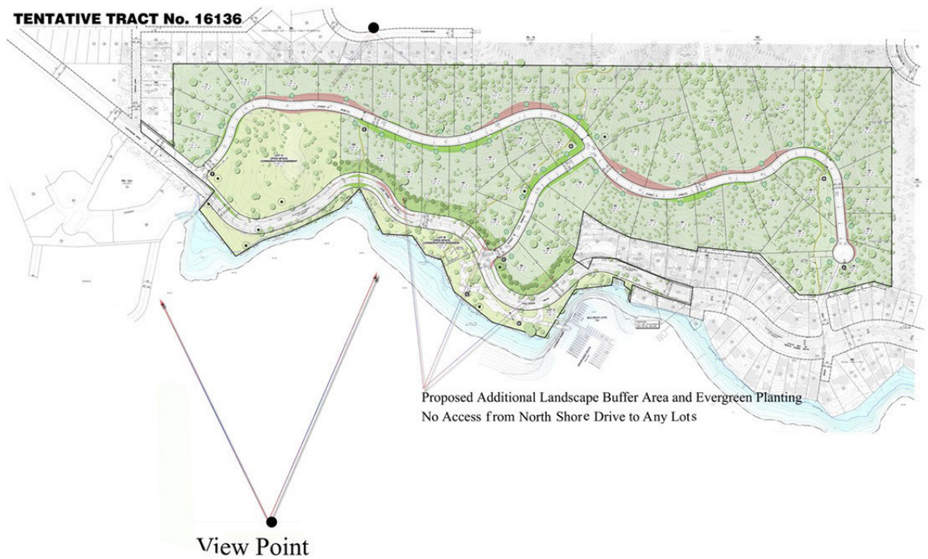
Michael Brandman Associates

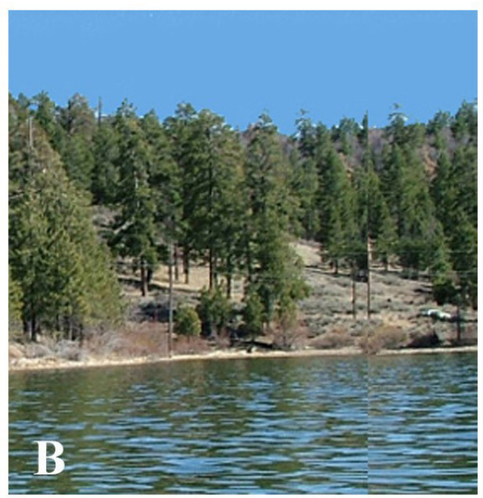
00520089 • 12/2009 | 4.1-8_Sim_View_Flicker_Rd.ai

Exhibit 4.1-8
Simulated View Looking South from Flicker Road between Lots 53 & 54

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT







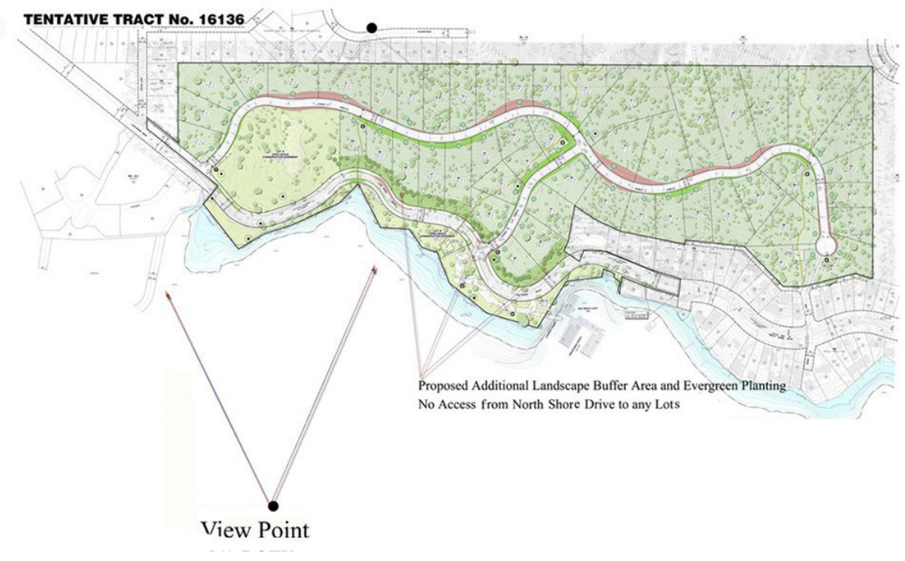
Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

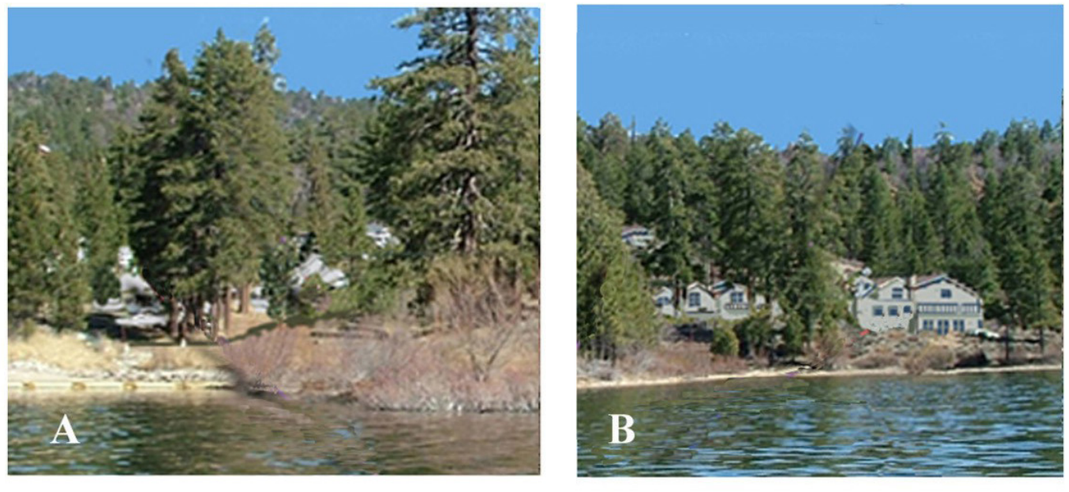
NORTH

Not To Scale

Michael Brandman Associates

Exhibit 4.1-9
Existing View Looking North from Big Bear Lake





Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

NORTH

Not To Scale

Michael Brandman Associates

00520089 • 12/2009 | 4.1-10_Sim_View_from_BLL.ai

Exhibit 4.1-10
Simulated View Looking North from Big Bear Lake Landscape Buffer

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

4.2 - Air Quality

This section analyzes the potential air quality impacts that would result from the development of the Moon Camp Residential Development Proposed Alternative Project (50 residential lots) and is based on the "Air Quality Analysis Report, Moon Camp Tentative Tract, Community of Fawnskin, San Bernardino County, California" (MBA 2008) included as Appendix A of this document. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000 et seq.). The methodology follows the CEQA Air Quality Handbook prepared by the South Coast Air Quality Management District (SCAQMD) for quantification of emissions and evaluation of potential impacts to air resources. As recommended by SCAQMD staff, URBEMIS 2002 version 8.7.0, developed and approved by the California Air Resources Control Board (CARB), was used to quantify some project-related emissions.

4.2.1 - Existing Conditions

The 62.43-acre project site is located adjacent to the northwest shore of Big Bear Lake, in the eastern portion of Fawnskin (refer to Exhibit 2-1, Regional Location Map). More specifically, the site is located in the northern half of Section 13, Township 2 North, Range 1 West, San Bernardino Base and Meridian. The project site is generally situated between Flicker Road to the north, Big Bear Lake to the south, Polique Canyon Road to the east, and Canyon Road to the west.

Regional access to the site is provided via State Route 38 (SR-38), which currently bisects the property. The Proposed Alternative Project would construct a proposed subdivision consisting of 50 residential lots and seven lettered lots for open space, conservation, neighborhood lake access, well sites, a potential reservoir, and common area. Proposed lot sizes range from one half acre to over 2 acres, and the subdivision would be developed for custom lot sales. Overall density of the Proposed Alternative Project is 0.90 dwelling units per acre. Even though project-specific grading would be limited to the construction of the interior streets and infrastructure and no grading of individual lots is proposed, for the purposes of determining the reasonably foreseeable impacts associated with full construction, this analysis of air quality assumes the construction of the homes.

4.2.2 - Regulatory Setting

Air pollutants are regulated at the international, national, state, and air basin level; each agency has a different degree of control. The United States Environmental Protection Agency (EPA) regulates at the national level. CARB regulates at the state level and the SCAQMD regulates at the air basin level.

International Regulation and the Kyoto Protocol

Although there is no regulation of the emission of criteria pollutants regulated under the Federal Clean Air Act and California Clean Air Act regulations, there is a history of international regulation of greenhouse gas (GHG) emissions. In 1988, the United Nations established the Intergovernmental Panel on Climate Change to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change. In 1992, the United States (U.S.) joined other countries around the world in signing the United Nations' Framework Convention on Climate

Change (UNFCCC) agreement with the goal of controlling GHG emissions. As a result, the Climate Change Action Plan was developed to address the reduction of GHGs in the United States. The Plan currently consists of more than 50 voluntary programs. The Kyoto protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. Some have estimated that if the commitments outlined in the Kyoto protocol are met, global GHG emissions could be reduced an estimated 5 percent from 1990 levels during the first commitment period of 2008-2012. Notably, while the U.S. is a signatory to the Kyoto protocol, Congress has not ratified the Protocol and the U.S. is not bound by the Protocol's commitments.

Federal and State Regulatory Agencies

The EPA sets national vehicle and stationary source emission standards; oversees approval of all State Implementation Plans (SIPs); provides research and guidance in air pollution programs; and sets National Ambient Air Quality Standards (NAAQS), also known as federal standards. There are NAAQS for six common air pollutants, called criteria air pollutants, which were identified resulting from provisions of the Clean Air Act of 1970.

The six criteria pollutants are:

- Ozone;
- Particulate matter (PM_{10} and $PM_{2.5}$);
- Nitrogen dioxide;
- Carbon monoxide (CO);
- Lead; and
- Sulfur dioxide.

The NAAQS were set to protect the health of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

CARB has overall responsibility for statewide air quality maintenance and air pollution prevention. The SIP for the State of California is administered by CARB. A SIP is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain NAAQS. CARB also administers California ambient air quality standards, or state standards, for the ten air pollutants designated in the California Clean Air Act (CCAA). All of the national criteria pollutants are also regulated by the State, with four additional pollutants added in California. These additional State air pollutants are:

- Visibility reducing particulates;
- Hydrogen sulfide;
- Sulfates; and
- Vinyl chloride.

The national and state ambient air quality standards and the most relevant effects are summarized in Table 4.2-1.

Table 4.2-1: Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard	Most Relevant Effects
Ozone	1 Hour	0.09 ppm	—	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage
	8 Hour	0.070 ppm	0.08 ppm	
Carbon Monoxide (CO)	1 Hour	20 ppm	35 ppm	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
	8 Hour	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm*	—	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
	Mean	0.030 ppm*	0.053 ppm	
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm	—	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
	24 Hour	0.04 ppm	0.14 ppm	
	Mean	—	0.030 ppm	
Particulate Matter (PM_{10})	24 hour	50 µg/m^3	150 µg/m^3	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in the elderly
	Mean	20 µg/m^3	—	
Particulate Matter ($PM_{2.5}$)	24 Hour	—	35 µg/m^3	
	Mean	12 µg/m^3	15 µg/m^3	
Sulfates	24 Hour	25 µg/m^3	—	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	30-day	1.5 µg/m^3	—	(a) Learning disabilities; (b) Impairment of blood formation and nerve conduction
	Quarter	—	1.5 µg/m^3	

Abbreviations:
ppm = parts per million µg/m^3 = micrograms per cubic meter
Mean = Annual Arithmetic Mean 30-day = 30-day average Quarter = Calendar quarter

* The nitrogen dioxide ambient air quality standard was amended on February 22, 2007. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected in 2007.
Source: South Coast Air Quality Management District, 2007 AQMP. CARB, Ambient Air Quality Standards, 2007.

Regulatory Setting

In order to determine the significance of air quality impacts that would result from project implementation, those impacts, along with existing air quality levels, must be compared to ambient air quality standards. These standards represent the levels of air quality considered safe, with an adequate margin of safety to protect the public health and welfare.

South Coast Air Quality Management District (SCAQMD)

The air pollution control agency for the South Coast Air Basin (Basin) is the SCAQMD. SCAQMD is responsible for controlling emissions primarily from stationary sources, and maintains air quality monitoring stations throughout the Basin. SCAQMD, in coordination with the Southern California Association of Governments, is also responsible for developing, updating, and implementing the Air Quality Management Plan (AQMP) for the Basin. An AQMP is a plan prepared by an air pollution control district for a county or region designated as a nonattainment area for bringing the area into compliance with the requirements of the national and/or California ambient air quality standards. The term "nonattainment area" is used to refer to an air basin where ambient air quality standards are exceeded. In conjunction with CARB and Southern California Association of Governments (SCAG), SCAQMD prepared the 2007 revisions to its AQMP.

The 2007 AQMP employs up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources.

The 2007 AQMP demonstrates attainment with the federal 8-hour ozone standard and for $PM_{2.5}$, replaces the 2003 attainment demonstration for the federal CO standard and maintenance plan for CO for the future; and updates the maintenance plan for the federal NO_2 standard that the Basin has met since 1992.

The 2007 AQMP also addresses several state and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2007 AQMP is consistent with and builds upon the approaches taken in the 2003 and 1997 AQMP and the 1999 Amendments to the SCAB SIP for the attainment of the federal ozone air quality standard.

Each revision of the AQMP represents a snapshot in time, based on the best available information. Generally, the 2007 AQMP is very similar in structure to the 2003 AQMP, the 1997 AQMP, and the 1999 Amendments to the SIP, but like all new editions it includes significant enhancements. The key updates incorporated in the 2007 AQMP are summarized as follows:

- Revised emissions inventory projections using 2002 as the base year, the CARB on-road motor vehicle emissions model EMFAC2007, and SCAG 2004 Regional Transportation Plan (RTP) forecast assumptions;

- Revised control strategy that updates remaining control measures from the 2003 AQMP, 1997/1999 SIP, and incorporation of new control measures toward attainment of the federal 8-hour ozone and $PM_{2.5}$ standards based on current technology assessments;
- Reliance on updated modeling tools for attainment demonstration relative to ozone,
- PM_{10} and $PM_{2.5}$; and
- Attainment demonstration of the federal 8-hour ozone and $PM_{2.5}$ standards.

The 2007 AQMP employs up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources. While many technical tasks are still underway to complete the Plan revision, there is sufficient information to begin framing policy discussions on clean air strategies. Hence, the Draft Plan has been prepared and is being released for early public review and participation.

The 2007 AQMP proposes attainment demonstration of the federal $PM_{2.5}$ standards through a more focused control of SO_x, directly emitted $PM_{2.5}$, and NO_x supplemented with volatile organic compound (VOC) by 2014. The 8-hour ozone control strategy builds upon the $PM_{2.5}$ strategy, augmented with additional VOC reductions to meet the standard by 2020. An extended attainment date (i.e., additional three years) is allowed under the Clean Air Act if a "bump-up" request is made by the state showing the need for such extension.

The 2007 AQMP proposes policies and measures currently contemplated by responsible agencies to achieve federal standards for healthful air quality in the Basin. The 2007 AQMP also addresses several federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools.

Local Government

Jurisdiction over the Proposed Alternative Project resides in San Bernardino County. The County of San Bernardino adopted a General Plan in 2007. The General Plan contains the goals, policies, and implementing actions for a variety of issues including natural and man-made hazards and natural and man-made resources; sets the framework for decision-making regarding the County's long-term development and utilization of resources; provides the data and analyses to support that decision-making framework; provides the rules by which land can be developed (what, where, and under what conditions); provides a consensus vision of what the citizens and Board of Supervisors want for the County's future; and establishes the operating rules for achieving that vision. Listed below are policies and programs contained in the General Plan that are pertinent to the protection of air quality.

Land Use Element

- **LU 8.1** – Potentially polluting, hazardous, and other health risk facilities should be located no closer than one-quarter mile to a sensitive receptor and vice versa.
- **LU 8.2** – Review development proposals to minimize impacts, such as air emissions, on sensitive receptors.
- **LU 9.2** – Discourage leap-frog development and urban sprawl by restricting the extension or creation of new urban services or special districts to areas that cannot be sustained in a fiscally responsible manner.

Circulation and Infrastructure Element

- **CI 3.1** – Encourage the reduction of automobile usage through various incentive programs.
- **CI 4.2** – To reduce the dependence on the automobile for local trips, integrate transportation and land use planning at the community and regional levels by promoting transit-oriented development (TOD), where appropriate and feasible.
- **CI 6.1** – Require safe and efficient pedestrian and bicycle facilities in residential, commercial, industrial, and institutional developments to facilitate access to public and private facilities and to reduce vehicular trips. Install bicycle lanes and sidewalks on existing and future roadways, where appropriate and as funding is available.
- **CI 6.3** – Retain residual road dedication that may result whenever a road is changed to a lower highway designation, thus reducing the required right-of-way, until it is determined that such dedication will not be needed for bicycle, pedestrian or equestrian trail purposes.
- **M/CI 1.10** – Support the development of park and ride transit service in the mountain communities.
- **M/CI 1.11** – When population and residential densities permit or warrant, develop shuttle services from residential neighborhoods to recreational areas and major commercial centers.

Housing Element

- **H 2.5** – Continue to evaluate residential developments with emphasis on energy-efficient design and siting options that are responsive to local climatic conditions and applicable laws.
- **H 2.10** – Encourage the use of energy conservation features in residential construction, remodeling, and existing homes.

Conservation Element

- **CO 4.1** – Because developments can add to the wind hazard (due to increased dust, the removal of wind breaks, and other factors), the County will require either as mitigation measures in the appropriate environmental analysis required by the County for the development proposal; or as conditions of approval if no environmental document is required; and that developments in areas identified as susceptible to wind hazards to address site-specific analysis of:

a.) Grading restrictions and/or controls on the basis of soil types, topography, or season.
b.) Landscaping methods, plant varieties, and scheduling to maximize successful revegetation.
c.) Dust-control measures during grading, heavy truck travel, and other dust generating activities.

- **CO 4.2** – Coordinate air quality improvement technologies with the SCAQMD and the Mojave Air Quality Management District (MAQMD) to improve air quality through reductions in pollutants from the region.
- **CO 4.3** – The County will continue to ensure through coordination and cooperation with all airport operators a diverse and efficient ground and air transportation system, which generates the minimum feasible pollutants.
- **CO 4.4** – Because congestion resulting from growth is expected to result in a significant increase in the air quality degradation, the County may manage growth by insuring the timely provision of infrastructure to serve new development.
- **CO 4.5** – Reduce emissions through reduced energy consumption.
- **CO 4.6** – Provide incentives such as preferential parking for alternative-fuel vehicles (e.g., Compressed Natural Gas (CNG) or hydrogen (H_2).
- **CO 4.8** – Replace existing vehicles in the County fleet with the cleanest vehicles commercially available that are cost-effective and meet the vehicle use needs.
- **CO 4.9** – Manage the County's transportation fleet fueling standards to improve the number of alternative fuel vehicles in the County fleet.
- **CO 4.10** – Support the development of alternative fuel infrastructure that is publicly accessible.
- **CO 4.11** – Establish programs for priority or free parking on County streets or in County parking lots for alternative fuel vehicles.
- **CO 4.12** – Provide incentives to promote siting or use of clean air technologies (e.g., fuel cell technologies, renewable energy sources, UV coatings, and hydrogen fuel).
- **CO 8.6** – Fossil fuels combustion contributes to poor air quality. Therefore, alternative energy production and conservation will be required, as follows:

a) New developments will be encouraged to incorporate the most energy-efficient technologies that reduce energy waste by weatherization, insulation, efficient appliances, solar energy systems, reduced energy demand, efficient space cooling and heating, water heating, and electricity generation.
b) All new subdivisions for which a tentative map is required will provide, to the extent feasible, for future natural heating or cooling opportunities in the subdivision. This can be accomplished by design of lot size and configuration for heating or cooling from solar exposure or shade and breezes, respectively.

c) For all new divisions of land for which a tentative map is required, a condition of approval will be the dedication of easements, for the purpose of assuring solar access, across adjacent parcels or units.

- **CO 8.8** – Promote energy-efficient design features, including appropriate site orientation, use of lighter color roofing and building materials, and use of deciduous shade trees and windbreak trees to reduce fuel consumption for heating and cooling.
- **CO 8.9** – Promote the use of automated time clocks or occupant sensors to control central heating and air conditioning.

4.2.3 - Air Pollutants

Criteria air pollutants are those pollutants that have been determined by EPA or CARB to have detrimental health effects for "sensitive" populations such as people with asthma, children, and older adults and for which health criteria have been established. Criteria air pollutants have historically been reported in three main categories – stationary sources, areawide sources, and mobile sources. Stationary sources are those that generate emissions from a stationary location, usually associated with manufacturing and industrial sources. Areawide sources are sources of emissions which are widely distributed and produce many emissions, individually small but collectively significant, such as consumer products, fireplaces, and solvent evaporation. Mobile source emissions are associated with motor vehicles and include on-road and off-road sources. On-road sources are emissions from vehicles, trucks, motorcycles, buses, etc. Off-road sources include equipment and vehicles in the following sectors: recreational, construction, mining, industrial, lawn and garden, farm, airport service, and rail. A brief summary of most recognized pollutants of concern follows:

- Carbon Monoxide (CO): A colorless, odorless toxic gas produced by incomplete combustion of carbon-containing fuels (e.g., gasoline or diesel fuel). CO levels tend to be highest during the winter months, when the meteorological conditions favor the accumulation of the pollutants.
- Ozone: A photochemical oxidant that is formed when reactive organic gases and oxides of nitrogen (both byproducts of internal combustion engines) react in the presence of ultraviolet sunlight. Ozone is a very energetic combination of three oxygen atoms that, when it comes into contact with a surface, releases its force as chemical energy. When this happens to biological systems (i.e., the respiratory tract and plants), this energy can cause damage to sensitive tissues.
- Oxides of nitrogen (NO_x): NO_x is a mixture of nitric oxide and nitrogen dioxide in the atmosphere. Nitric oxide is from a byproduct of fuel combustion and quickly reacts with oxygen to form nitrogen dioxide. NO_x emissions contribute to the formation of ozone and particulate matter. The only form of NO_x that exists at a level to cause public health concerns is nitrogen dioxide.
- Sulfur dioxide and sulfates: In California, sulfur is emitted during the combustion of petroleum-derived fuels (i.e., gasoline and diesel fuel) that contain sulfur. During combustion,

sulfur is oxidized to sulfur dioxide (a colorless pungent gas). The sulfur dioxide is then converted to sulfate compounds in the atmosphere.

- Lead: Lead is a heavy metal that can accumulate in bone, soft tissue, and blood and can damage the kidneys, liver, and nervous system, and can result in learning disabilities, seizures, and death. Lead concentrations once exceeded the state and national air quality standards by a wide margin, but have not exceeded state or national air quality standards in the area for at least 10 years. Lead is no longer an additive in gasoline, which is the main reason the concentration of lead in the air is low.

- Suspended PM_{10} and $PM_{2.5}$: Particulate matter is a mixture of small particles that consists of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM_{10} refers to particulate matter that is 10 microns or less in diameter (1 micron is one-millionth of a meter). $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter. Sources include road dust, diesel soot, erosion of soil, combustion particles (ashes and soot), and tire and brake abrasion.

- Volatile organic compounds (VOCs): VOCs are organic compounds that readily evaporate. Reactive organic gases (ROGs) consist of nonmethane and oxygenated hydrocarbons. Although all VOCs are not necessarily ROGs, the terms are often interchanged. There are no state or national ambient air quality standards for VOCs; however, they are regulated because they are involved in chemical reactions that contribute to the formation of ozone. In addition, some hydrocarbon components classified as VOCs (i.e., benzene) are thought or known to be hazardous. Sources of VOCs include adhesives, solvents, paints, cooking, fuel, and combustion. VOC can interfere with oxygen uptake and can cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis.

- Diesel particulate matter (DPM): A subset of particulate matter that is a matter of concern is DPM. Diesel exhaust is a mixture of many particles and gases that is produced when an engine burns diesel fuel. Many compounds found in diesel exhaust are carcinogenic, including sixteen that are classified as possibly carcinogenic by the International Agency for Research on Cancer. DPM includes the particle-phase particles in diesel exhaust. Components of DPM include elemental and organic carbon. Elemental carbon is carbon that has had hydrogen taken from it. Organic carbon contains molecules containing carbon and hydrogen, and can also contain oxygen, sulfur, and nitrogen. Exposure to diesel exhaust can cause immediate health effects. Some of the health effects include eye, nose, and throat irritation as well as cough, nausea, and phlegm. The elderly, children, people with allergies, and those with asthma, emphysema, and chronic heart and lung disease are more susceptible to the effects of diesel exhaust is a mixture of many particles and gases that is produced when an engine burns diesel fuel. Many compounds found in diesel exhaust are carcinogenic. DPM includes the particle-phase particles in diesel exhaust. Some of the health effects of DPM include eye, nose, and throat irritation as well as cough, nausea, and phlegm.

- GHGs: Certain atmospheric gases act as an insulating blanket for solar energy to keep the global average temperature in a suitable range, and help to regulate the climate by absorbing infrared radiation in the atmosphere and allowing incoming solar radiation to pass through the atmosphere. These gases are called "greenhouse gases" (GHGs) because they trap heat like the glass walls of a greenhouse. Some GHGs include water vapor, methane, carbon dioxide (CO_2), nitrous oxide, ozone, halogenated fluorocarbons, perfluorinated carbons, and hydrofluorocarbons. The most common GHG is CO_2, which constitutes approximately 84 percent of all GHG emissions in California (CEC, 2006).

    - Water vapor (H_20) is the most abundant, important, and variable GHG in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered to be a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. The feedback loop in which water is involved is critically important to projecting future climate change. As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to 'hold' more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a "positive feedback loop." The extent to which this positive feedback loop will continue is unknown as there are also dynamics that hold the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually also condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the Earth's surface and heat it up). There are no health effects from water vapor itself; however, when some pollutants come in contact with water vapor, they can dissolve and the water vapor can then act as a pollutant-carrying agent. The main source of water vapor is evaporation from the oceans (approximately 85 percent). Other sources include: evaporation from other water bodies, sublimation (change from solid to gas) from sea ice and snow, and transpiration from plant leaves.
    - Carbon dioxide (CO_2) is an odorless and colorless GHG. Outdoor levels of carbon dioxide are not high enough to result in negative health effects. Carbon dioxide is emitted from natural and manmade sources. Natural sources include the decomposition of dead organic matter; respiration of bacteria, plants, animals and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include the burning of coal, oil, natural gas, and wood. Carbon dioxide is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks. Since the industrial revolution began in the mid-1700s, the sort of human activity that increases GHG emissions has increased dramatically in

scale and distribution. Data from the past 50 years suggests a corollary increase in levels and concentrations. As an example, prior to the industrial revolution, CO concentrations were fairly stable at 280 parts per million (ppm). Today, they are around 370 ppm, an increase of more than 30 percent. Left unchecked, the concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources.

- Methane (CH_4) is an extremely effective absorber of radiation, though its atmospheric concentration is less than carbon dioxide and its lifetime in the atmosphere is brief (10-12 years), compared to other GHGs. No health effects are known to occur from exposure to methane. Methane has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane. Other anthropocentric sources include fossil fuel combustion and biomass burning.
- Nitrous oxide (N_2O), also known as laughing gas, is a colorless GHG. Nitrous oxide can cause dizziness, euphoria, and sometimes slight hallucinations. In small doses, it is considered harmless. However, in some cases, heavy and extended use can cause Olney's Lesions (brain damage). Concentrations of nitrous oxide also began to rise at the beginning of the industrial revolution. In 1998, the global concentration was 314 parts per billion (ppb). Nitrous oxide is produced by microbial processes in soil and water, including those reactions, which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used as an aerosol spray propellant (i.e., in whipped cream bottles). It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars. Nitrous oxide can be transported into the stratosphere, be deposited on the earth's surface, and be converted to other compounds by chemical reaction.
- Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in methane or ethane (C_2H_6) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble and chemically unreactive in the troposphere (the level of air at the earth's surface). CFCs are no longer being used; therefore, it is not likely that health effects would be experienced. Nonetheless, in confined indoor locations, working with CFC-113 or other CFCs is thought to result in death by cardiac arrhythmia (heart frequency too high or too low) or asphyxiation. CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful, so much so that levels of the major CFCs are now remaining steady

or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years.

- Hydrofluorocarbons (HFCs) are synthetic, man-made chemicals that are used as a substitute for CFCs. Out of all the GHGs, they are one of three groups with the highest global warming potential. The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF_3), HFC-134a (CF_3CH_2F), and HFC-152a (CH_3CHF_2). Prior to 1990, the only significant emissions were of HFC-23. HFC-134a emissions are increasing due to its use as a refrigerant. The U.S. EPA estimates that concentrations of HFC-23 and HFC-134a are now about 10 parts per trillion (ppt) each; and that concentrations of HFC-152a are about 1 ppt. No health effects are known to result from exposure to HFCs, which are manmade for applications such as automobile air conditioners and refrigerants.
- Perfluorocarbons (PFCs) have stable molecular structures and do not break down though chemical processes in the lower atmosphere. High-energy ultraviolet rays, which occur about 60 kilometers above Earth's surface, are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF_4) and hexafluoroethane (C_2F_6). The U.S. EPA estimates that concentrations of CF_4 in the atmosphere are over 70 ppt. No health effects are known to result from exposure to PFCs. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

- Visibility reducing particles: Visibility reducing particles are suspended particulate matter. Visibility is the distance through the air that can be seen without the use of instrumental assistance. The 8-hour state standard is the extinction coefficient of 0.23 kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70 percent. Visibility reducing particles are not assessed in this report; however, particulate matter is assessed.

- Vinyl chloride: Vinyl chloride is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride is a known carcinogen. The 24-hour state standard for vinyl chloride is 0.01 ppm. The proposed project is not expected to generate or be exposed to vinyl chloride because its uses do not include the chemicals processes that create this pollutant. Therefore, it is not assessed in this report.

- Hydrogen sulfide: Hydrogen sulfide is a flammable, colorless, poisonous gas that smells like rotten eggs. It can irritate the eyes and respiratory tract and cause symptoms like headache, nausea, vomiting, and cough. The 1-hour state standard for hydrogen sulfide is 0.03 ppm. Sources include the combustion of sulfur containing fuels (oil and coal) and organic matter that undergoes putrefaction. It is used in the production of heavy water for nuclear reactors, the manufacture of chemicals, in metallurgy, and as an analytical reagent. The proposed project is

not expected to cause exposure to hydrogen sulfide because it will not generate hydrogen sulfide in any substantial quantity. Therefore, hydrogen sulfide is not assessed in this analysis.

4.2.4 - Physical Setting

Local Climate

Ambient Air Quality Standards

The national and state standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. The health effects of a pollutant are a factor of the dose of the pollutant, the length of exposure, the pollutant's properties, and the body's ability to excrete the pollutant. Table 4.2-1 refers to the current national and state standards, as well as the relevant health effects.

Local Climate

As previously stated, the Proposed Alternative Project is located near the community of Fawnskin, on the north shore of Big Bear Lake in San Bernardino County. This region is located within the Basin. Regional and local air quality is impacted by dominant airflows, topography, atmospheric inversions, location, season, and time of day.

The presence and intensity of sunlight are necessary prerequisites for the formation of ozone. Under the influence of the ultraviolet radiation of sunlight, certain primary pollutants (mainly VOC and NO_X) react to form a secondary pollutant – ozone. Since this process is time dependent, ozone can be formed many miles downwind from the emission sources. Because of the prevailing daytime winds and time-delayed nature of ozone, concentrations are highest in the inland areas of Southern California. However, a majority of the smog in the Big Bear Valley is created by the transport of pollutants from Los Angeles, Riverside, and San Bernardino counties, as opposed to local sources.

The climate in the Basin is characterized by moderate temperatures and comfortable humidity with precipitation generally limited to a few storms during the winter season (November through April). The average annual temperature varies little throughout the Basin, averaging 75 degrees Fahrenheit (ºF). More specifically, the Community of Fawnskin enjoys an Alpine climate. The Community is located in an area that intercepts water-laden clouds that can result in rainfall and/or snow. Precipitation at Big Bear Lake's National Weather Service station from 1960 to 2006 averaged about 18 inches for the six-month period from November to April and the average snowfall for January, February, and March is above 14 inches per month. The area's watershed is mountainous with steep upper slopes leading to a mildly sloping valley. The coolest month of the year is January, with a mean monthly temperature of 33.7 ºF. The warmest month is July, with a mean monthly temperature of 63.9 ºF.

Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. The mountains surrounding the Los Angeles region form natural horizontal barriers to the dispersion of air contaminants. Air pollution created in the coastal areas and around the Los Angeles area is

transported inland until it reaches the mountains where the combination of mountains and inversion layers generally prevent further dispersion. The area in which the Community of Fawnskin is located offers approximately 300 days/year of clear skies and sunshine and is above the typical inversion altitudes of the Los Angeles area; however, it is still susceptible to air inversions. This traps a layer of stagnant air near the ground where it is further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, wood stoves, and other sources.

Local Air Quality

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. SCAQMD has divided the basin into 38 Source Receptor Areas (SRA) for evaluation purposes and operates monitoring stations within each one. Existing levels of ambient air quality and historical trends and projections of air quality in the project area are best documented from measurements made near the project site. SCAQMD operates an air monitoring station in Big Bear City, approximately 4 miles east of the project, but it only measures $PM_{2.5}$. The nearest site that measures PM_{10}, which is operated by the MDAQMD, is located approximately 10 miles north of the project in Lucerne Valley at the Middle School. The nearest ozone monitor is operated by the SCAQMD located at Lake Gregory – Crestline, approximately 20 miles west of the project site. Table 4.2-2 summarizes 2004-2006 published monitoring data for the nearest monitors. The SCAQMD and CARB have decided that the only pollutant of concern enough to be monitored in the area where the project is located is $PM_{2.5}$. PM_{10} and ozone monitoring information are supplied for informational purposes but may not represent accurate localized conditions of the project site.

Table 4.2-2: San Bernardino Mtn. Air Quality Monitoring Summary

Air Pollutant, Averaging Time (Units)	2004	2005	2006
Ozone - Crestline			
Max 1 Hour (ppm) Days > CAAQS (0.09 ppm) Days > NAAQS (0.12 ppm)*	0.163 75 9	0.182 80 18	0.164 73 –
Max 8 Hour (ppm) Days > CAAQS (0.070 ppm)* Days > NAAQS (0.08 ppm)	0.145 – 66	0.145 119 69	0.142 103 59
Particulate Matter (PM_{10}) – Lucerne Valley			
Mean ($\mu g/m^3$)	18.1	19.1	23.0
24 Hour ($\mu g/m^3$) Days > CAAQS (50 $\mu g/m^3$) Days > NAAQS (150 $\mu g/m^3$)	47 0 0	57 1 0	50 0 0
Particulate Matter ($PM_{2.5}$) – Big Bear City			
Mean ($\mu g/m^3$)	NA	NA	NA
24 Hour ($\mu g/m^3$) Days > NAAQS (35 $\mu g/m^3$)	28.6 0	38.7 0	40.0 0

Table 4.2-2 (cont.): San Bernardino Mtn. Air Quality Monitoring Summary

Air Pollutant, Averaging Time (Units)	2004	2005	2006
Abbreviations: > = exceed ppm = parts per million $\mu g/m^3$ = micrograms per cubic meter NA = not available max = maximum Mean = Annual Arithmetic Mean CAAQS = California Ambient Air Quality Standard NAAQS = National Ambient Air Quality Standard Note: NAAQS for 1-hour ozone and the CAAQS for 8-hour are presented for the years the standards were in effect Source: CARB Air Quality Data/Statistics/Top 4 Summary, 6/1/2007.			

Local Sources of Air Pollutants

The project area is primarily a resort area with recreational activities for all four seasons. The primary source of local pollution is vehicular in both summer and winter, with the addition of wood smoke during the winter. Recreational boating is also a CO and VOC source.

Rules Applicable to the Proposed Alternative Project

The rules and regulations that apply to this project include but are not limited to the following:

- SCAQMD Rule 403, which governs emissions of fugitive dust. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour (mph), sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites.

- SCAQMD Rule 1108 governs the sale, use, and manufacturing of asphalt and limits the ROG content in asphalt used in the South Coast Air Basin. Although this rule does not directly apply to the Proposed Alternative Project, it does dictate the ROG content of asphalt available for use during the construction.

- SCAQMD Rule 1113 governs the sale, use, and manufacturing of architectural coating and limits the ROG content in paints and paint solvents. Although this rule does not directly apply to the Proposed Alternative Project, it does dictate the ROG content of paints available for use during the construction of buildings.

- SCAQMD Rule 402 governs the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

Alternate Forms of Transportation

The Mountain Area Regional Transit Authority (MARTA) is the primary public transportation provider on the mountaintop, providing local and off-the-mountain bus service to the Big Bear Valley, Running Springs, Lake Arrowhead, Crestline, and San Bernardino. The agency operates both fixed route and demand-response services (Dial-A-Ride). MARTA has connecting services to Metrolink, Omnitrans, and Greyhound.

Attainment Status

Air basins where ambient air quality standards are exceeded are referred to as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are classified as severe, serious, or moderate as a function of deviation from standards.

The current attainment designations for the project area are shown in Table 4.2-3. The "attainment year" is the goal of the existing 2003 AQMP and 2007 AQMP. The basin is in state non-attainment for ozone, PM_{10}, and $PM_{2.5}$, and is in federal nonattainment for ozone, CO, PM_{10}, and $PM_{2.5}$. Note that CO is still classified as "serious nonattainment" for the federal CO standard even though the attainment date has passed and the basin met the CO standard by December 2002. In 2004, SCAQMD requested that EPA re-designate the basin as in attainment with the CO ambient air quality standard, but EPA has not made a formal action to do so. The 2003 AQMP served as a maintenance plan for CO, and the 2007 AQMP is an update to that maintenance plan.

Table 4.2-3: SCAB Attainment Status

Pollutant	State Status	National Status [Attainment Year]
Ozone (1-hour)	Non-attainment	Not Subject
Ozone (8-hour)	Non-attainment	Severe Non-attainment [2021]
Carbon Monoxide	Attainment	Serious Non-attainment [2000]
Nitrogen Dioxide	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
PM_{10}	Non-attainment	Serious Non-attainment [2006]
$PM_{2.5}$	Non-attainment	Non-attainment [2015]
Source: State Status from CARB, 2006. National Status from U.S. EPA, 2007.		

4.2.5 - Global Climate Change

Gases that trap heat in the atmosphere are called GHGs. The greenhouse effect is analogous to the way a greenhouse retains heat, and raises the temperature of the earth's surface by about 60 ºF. With the natural greenhouse effect, the average temperature of the earth is about 45 ºF; without it, the earth

would be about -15 ºF. Global warming is an average rise in the earth's temperature, which can cause changes in climate. It is normal for the earth's temperature to fluctuate over extended periods of time. Over the past one hundred years, however, the earth's average global temperature has generally increased by 1 ºF. Scientists refer to the global warming context of the past century as the "enhanced greenhouse effect" to distinguish it from the natural greenhouse effect. While the increase in temperature is known as "global warming", the resulting change in weather patterns is known as "global climate change." Global climate change is evidenced in changes to wind patterns, storms, precipitation, and air temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages, but some data indicates that the current temperature record differs from previous climate changes in rate and magnitude.

Common GHGs include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Both natural processes and human activities emit GHGs. However, it is believed that emissions from human activities, such as electricity production and vehicle exhaust, have elevated the concentration of these gases in the atmosphere, leading to a trend of unnatural warming of the Earth's climate, known as global warming or climate change.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of GHGs at 400-450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below 2 degrees Celsius, which is assumed to be necessary to avoid dangerous climate change (IPCC 2001).

The State of California is a substantial contributor of global GHGs as it is the second largest contributor in the U.S. and the sixteenth largest in the world (CEC 2006). The California Energy Commission calculated that in 2004 California produced 492 million metric tons of carbon dioxide equivalent (CEC 2006).

An individual project cannot generate enough GHG emissions to effect a discernible change in global climate. However, the Proposed Alternative Project may participate in this potential impact by its incremental contribution combined with the cumulative increase of all other sources of GHGs, which when taken together constitute potential influences on global climate change. Because these changes may have serious environmental consequences, this section will evaluate the potential for the Proposed Alternative Project to have a significant effect upon California's environment as a result of its potential contribution to the enhanced greenhouse effect.

Federal Regulation

In the past, the U.S. EPA has not regulated GHGs under the Clean Air Act because it asserted that the Act did not authorize it to issue mandatory regulations to address global climate change and that such regulation would be unwise without an unequivocally established causal link between GHGs and the

increase in global surface air temperatures. However, the U.S. Supreme Court recently held that the EPA must consider regulation of motor-vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency et al.*, twelve states and cities, including California, together with several environmental organizations, sued to require the EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 (2007). The Court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and that the EPA did not have a valid rationale for not regulating GHGs. Despite the Court's ruling, to date the EPA has not promulgated regulations on GHG emissions; however, Congress is currently working on legislation that would address GHGs.

State Regulation

There has been significant legislative activity regarding global climate change and GHGs in California. California Assembly Bill 1493 (Pavley), enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Regulations adopted by the ARB would apply to 2009 and later model year vehicles. The ARB estimates that the regulation would reduce climate change emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S 3-05, the following GHG emission reduction targets:

1. By 2010, reduce GHG emissions to 2000 levels;
2. By 2020, reduce GHG emissions to 1990 levels; and
3. By 2050, reduce GHG emissions to 80 percent below 1990 levels.

Climate Action Team

To meet these targets, the Governor directed the Secretary of the Cal EPA to lead a Climate Action Team (CAT) made up of representatives from the Business, Transportation and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the Air Resources Board; the Energy Commission; and the Public Utilities Commission. The CAT's Report to the Governor in 2006 (2006 CAT Report) contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

AB 32

In 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. In adopting this legislation (commonly known as AB 32), the State initiated a long-term program for the development of GHG emissions reduction measures. AB 32 focuses on reducing GHG emissions in California and requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. GHGs, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, HFCs, PFCs, and SF_6. The ARB is the state agency charged with monitoring and regulating sources of emissions of GHGs that cause global warming in order to reduce emissions of

GHGs. AB 32 required ARB to determine what, the statewide GHG emissions level was in 1990 and approve a statewide GHG emissions limit by January 1, 2008, so it may be applied to the 2020 benchmark. Currently, GHG levels have been estimated at 600 MMTs of CO_2 equivalent, while 1990 levels have been estimated to be 427 MMTs. Accordingly, emissions need to be reduced by 173 MMTs by 2020.

On December 11, 2008, CARB adopted a scoping plan to reduce GHG emissions to 1990 levels. The Scoping Plan's recommendations for reducing GHG emissions to 1990 levels by 2020 include emission reduction measures, including a cap-and-trade program linked to Western Climate Initiative partner jurisdictions, green building strategies, recycling and waste-related measures, as well as Voluntary Early Actions and Reductions. CARB has until January 1, 2011, to adopt the necessary regulations to implement that plan. Implementation of individual measures must begin no later than January 1, 2012, so that the emissions reduction target can be fully achieved by 2020. CARB is currently drafting regulations to implement the plan.

SB 97

AB 32, however, did not amend CEQA or establish regulatory standards to be applied to new development or environmental review of projects within the state. Accordingly, the Legislature adopted Senate Bill 97 (SB 97) in August 2007. SB 97 requires the California Office of Planning and Research (OPR) to prepare and transmit new CEQA guidelines for the mitigation of GHG emissions or the effects of GHG emissions to the Resources Agency by July 1, 2009. These guidelines for mitigation must address, but are not limited to, GHG emissions and effects associated with transportation and energy consumption. Following receipt of these guidelines, the Resources Agency must certify and adopt the guidelines prepared by OPR by January 1, 2010.

OPR

OPR released preliminary draft CEQA Guideline amendments for GHG emissions on January 8, 2009, and submitted its final proposed guidelines to the Secretary for Natural Resources on April 13, 2009. Of note, the final proposed guidelines state that a lead agency shall have discretion to determine whether to use a quantitative model or methodology, or in the alternative, rely on a qualitative analysis or performance based standards. Proposed CEQA Guideline § 15064.4(a) "A lead agency shall have discretion to determine, in the context of a particular project, whether to: (1) use a model or methodology to quantify GHG emissions resulting from a project, and which methodology to use; or (2) rely on a qualitative analysis or performance based standards."

In its draft CEQA Guideline amendments, OPR does not identify a threshold of significance for GHG emissions, nor does it prescribe assessment methodologies or specific mitigation measures. Instead, it calls for a "good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions resulting from a project." The draft amendments encourage lead agencies to consider many factors in performing a CEQA analysis and preserve lead agencies' discretion to make their own determinations based upon substantial evidence. The draft amendments also

encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses.

The Natural Resources Agency will begin a formal rulemaking process to certify and adopt the amendments as part of the state regulations implementing CEQA. Consistent with SB 97, the Natural Resources Agency should complete this process by January 2010. Until these Guidelines are approved, OPR's June 2008 Technical Advisory provides interim advice to lead agencies regarding the analysis of GHG emissions in environmental documents. The Technical Advisory encourages lead agencies to follow three basic steps: (1) identify and quantify the GHG emissions that could result from the proposed project; (2) analyze the effects of those emissions and determine whether the effect is significant, and (3) if the impact is significant, identify feasible mitigation measures or alternatives that will reduce the impact below a level of significance.

CARB's Preliminary Draft Staff Proposal for Interim Significance Thresholds

Although OPR was tasked with updating the CEQA guidelines for GHGs, OPR asked CARB in its Technical Advisory to recommend GHG-related CEQA significance thresholds to assist lead agencies in their significance determination. CARB Staff released a draft proposal on October 24, 2008, with interim guidance on significance thresholds. In its proposal, Staff noted that non-zero thresholds can be supported by substantial evidence, but thresholds should nonetheless be sufficiently stringent to meet the State's interim (2020) and long-term (2050) emissions reduction targets. CARB staff believes that zero thresholds are not mandated in light of fact that: (1) some level of emissions in the near-term and mid-century is still consistent with climate stabilization, and (2) current and anticipated regulations apart from CEQA will proliferate and increasingly will reduce GHG contributions of past, present and future projects. The CARB proposal takes different approaches for different sectors – (1) industrial projects and (2) residential and commercial projects.

CARB Staff has proposed a numerical threshold for the GHG emissions of industrial projects of 7,000 metric tons per year, which is intended to require some form of mitigation from 90 percent of all projects; however, no numerical threshold has been proposed for commercial (and residential) projects. For residential and commercial projects, CARB Staff recommends that if a project complies with a previously approved plan that addresses GHG emissions, it would not have a cumulatively considerable incremental contribution to impacts identified in the previously approved plan, and has a number of specific attributes related to meeting and monitoring GHG targets, then it will not be considered to have significant GHG emissions. Alternatively, if those standards cannot be met, Staff recommends a threshold based on implementation of performance standards, or equivalent mitigation measures, addressing energy use, transportation, water use, waste and construction.

The draft proposal has been very controversial and Staff will be bringing a revised draft to the Board in the future. A key preliminary conclusion from the draft thresholds, however, is that CARB Staff, in setting a numerical threshold for industrial projects and suggesting performance standards, does not believe a "zero threshold" is mandated by CEQA. Similarly, SCAQMD staff, in proposing interim

industrial thresholds, explicitly stated in a December 5, 2008, report that a zero threshold would not be feasible to implement.

SCAQMD

The SCAQMD is currently in the process of developing a threshold of significance for GHG emissions. Although the SCAQMD threshold would technically only apply to projects for which SCAQMD was acting as a CEQA lead agency, the proposed threshold methodology is nonetheless instructive, and is based on a "Tiered Decision Tree" approach based on the concept of business-as-usual (BAU). This approach contains a series of tiers to evaluate a project, starting with exemptions (Tier 1), continuing through consistency with regional plan GHG budgets (Tier 2), quantitative screening level threshold (Tier 3), performance standards (Tier 4), to application of emission offsets (Tier 5).

The SCAQMD's GHG CEQA Significance Thresholds Working Group released a draft threshold methodology in August 2008 (SCAQMD 2008b), and the most recent screening level proposed by staff was 6,500 metric tons of CO_2 equivalent per year (6,500 MT/year CO2). This screening level was derived using the SCAQMD's existing NO_x operational threshold as a basis. The daily NO_x operational significance threshold, 55 pounds per day was annualized, which results in 10 tons of NO_x per year. Projects with GHG emissions less than the screening level are considered to be small projects, that is, they would not likely emit amounts of GHGs to be considered significant pursuant to CEQA.

Senate Bill 375

In September of 2008, the California legislature adopted SB 375, legislation which: (1) relaxes CEQA requirements for some housing projects that meet goals for reducing greenhouse-gas emissions and (2) requires the regional governing bodies in each of the state's major metropolitan areas to adopt, as part of their regional transportation plan, "sustainable community strategies" that will meet the region's target for reducing GHG emissions. SB 375 creates incentives for implementing the sustainable community strategies by allocating federal transportation funds only to projects that are consistent with the emissions reductions. SB 375 also directs CARB to develop regional GHG emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035.

CARB will determine the level of emissions produced by cars and light trucks, including S.U.V.s, in each of California's 17 metropolitan planning areas. Emissions-reduction goals for 2020 and 2035 would be assigned to each area. CARB appointed a Regional Targets Advisory Committee (RTAC) on January 23, 2009 to provide recommendations on factors to consider and methodologies to use in this target setting process. RTAC must provide recommendations to CARB by September 30, 2009, whereupon CARB must propose draft targets by June 10, 2010 and adopt final targets by September 30, 2010.

Local governments would then devise strategies for housing development, road building and other land uses to shorten travel distances, reduce driving and meet the new targets. If regions develop these integrated land use, housing, and transportation plans, residential projects that conform to the sustainable community strategy (and therefore contribute to GHG reduction) can have a more streamlined environmental review process.

California Air Pollution Control Officers Association White Paper

The California Air Pollution Control Officers Association (CAPCOA) released a white paper in January 2008 entitled "CEQA & Climate Change," which discussed three alternative thresholds, including a no significance threshold, a zero increase threshold, and a non-zero threshold, as well as multiple analysis options. The white paper is a resource guide developed to support local governments, and details tools for GHG assessment, emission models, and mitigation strategies to reduce potentially significant GHG emissions from a project.

Local Public Agencies

The California Attorney General sued San Bernardino County based on the County's General Plan Update EIR. That case resulted in a settlement agreement between the County and the California Attorney General's office, filed with the Central District Superior Court of San Bernardino County on August 28, 2007. Under the settlement agreement, the County agreed to prepare an amendment to the General Plan to add a policy that describes the County's goal of reducing GHG attributable to the County's discretionary land use decisions and internal government operations. The County also agreed to prepare a GHG Emissions Reduction Plan. The settlement agreement details the contents of the GHG Emission Reduction Plan, including GHG inventories and emission reduction targets. Both the General Plan amendment and the GHG Emission Reduction Plan should be completed within 30 months of the execution of the settlement agreement. The settlement agreement also contains provisions for diesel engine exhaust control measures to be implemented by the County.

Greenhouse Gases

Potential Environmental Effects

Worldwide, average temperatures are likely to increase by 1.8 degrees Celsius (°C) to 4°C, or approximately 3 °F to 7 °F, by the end of the 21st Century (IPCC 2007a). However, a global temperature increase does not translate to a uniform increase in temperature in all locations on the earth. Regional climate changes are dependant on multiple variables, such as topography. One region of the Earth may experience increased temperature, increased incidents of drought and similar warming effects, whereas another region may experience a relative cooling. According to the IPCC's Working Group II Report, Climate Change impacts to North America may include (IPCC 2007b): diminishing snowpack; increasing evaporation; exacerbated shoreline erosion; exacerbated inundation from sea level rising; increased risk and frequency of wildfire; increased risk of insect outbreaks; increased experiences of heat waves; and, rearrangement of ecosystems, as species and ecosystem zones shift northward and to higher elevations.

For California, Climate Change has the potential to incur/exacerbate the following environmental impacts (CAT 2006):

- Increased frequency, duration, and intensity of conditions conducive to air pollution formation (particularly ozone);
- Reduced precipitation;
- Changes to precipitation and runoff patterns;
- Reduced snowfall (precipitation occurring as rain instead of snow);
- Earlier snowmelt;
- Decreased snowpack;
- Increased agricultural demand for water;
- Intrusion of seawater into coastal aquifers;
- Increased agricultural growing season;
- Increased growth rates of weeds, insect pests and pathogens;
- Inundation of low-lying coastal areas by sea level rise;
- Increased incidents and severity of wildfire events; and,
- Expansion of the range and increased frequency of pest outbreaks.

Although certain environmental effects are widely accepted to be a potential hazard to certain locations, such as rising sea level for low-laying coastal areas, it is currently infeasible to predict all environmental effects of climate change on any one location.

4.2.6 - Thresholds of Significance

The following significance thresholds were derived from Appendix G of the CEQA Guidelines. A significant impact would occur if the proposed project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or protected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Contribute to a significant global climate change impact by conflicting with GHG emission reduction strategies.
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people; or
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone).

While the formulation of the thresholds of significance is within the purview of the lead agency pursuant to §15064(b) of the State CEQA Guidelines, the SCAQMD recommends that the following quantitative air pollution thresholds be used by the lead agencies in determining whether the proposed project could result in a significant impact. If the lead agency finds that a proposed project has the potential to exceed these air pollution thresholds, the project should be considered significant. These thresholds have been defined by SCAQMD for the SCAB based on scientific data the SCAQMD has obtained and factual data within the federal and state Clean Air Acts. Since the Proposed Alternative Project is located within the SCAB and current air quality in the project area is typical of the air basin as a whole, and because the SCAQMD is the regulatory agency that has authority over air quality regulations and has special knowledge in this regard, the thresholds set by the SCAQMD are appropriate to use to determine the significance of air quality impacts resulting from the Proposed Alternative Project. Each of these threshold factors is discussed below.

4.2.7 - Regional Significance Thresholds

The following regional significance thresholds have been established by SCAQMD. Projects within the Basin region with construction- or operation-related emissions in excess of any of the thresholds presented in Table 4.2-4 are considered significant:

Table 4.2-4: SCAQMD Regional Thresholds

Pollutant	Construction (pounds per day)	Operation (pounds per day)
Oxides of Nitrogen (NO_X)	100	55
Volatile Organic Compounds (VOC)	75	55
Particulate Matter (PM_{10})	150	150
Particulate Matter ($PM_{2.5}$)	55	55
Oxides of Sulfur (SO_X)	150	150
Carbon Monoxide (CO)	550	550
Source: South Coast Air Quality Management District, 2006.		

4.2.8 - Local Significance Thresholds

Construction

The SCAQMD Governing Board adopted a methodology for calculating localized air quality impacts through localized significance thresholds (LSTs), which is consistent with SCAQMD's Environmental Justice Enhancement Initiative I-4. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable state or national ambient air quality standard. The LSTs are developed based on the ambient concentrations of that pollutant for each source receptor area and are applicable to NO_X, CO, PM_{10}, and $PM_{2.5}$.

The Proposed Alternative Project is located in Source Receptor Area 38. Even though the Proposed Alternative Project's construction activity is limited to the construction of the interior streets and infrastructure and no grading of individual lots is proposed, in order to evaluate worst-case conditions, it is assumed that construction on the 50 lots will occur over a 12 month period and that a maximum of 4 acres would be disturbed per day. Using the 2003-2005 look-up tables provided in the LST Guidelines for a conservative 5 acres per day disturbed at a receptor distance of 25 meters, Table 4.2-5 shows the appropriate LSTs for construction activity.

Table 4.2-5: SCAQMD Localized Thresholds for Construction

Pollutant	Localized Significance Threshold (lbs/d)
Nitrogen Dioxide (NO_2)	439
Carbon Monoxide (CO)	1,363
Particulate Matter (PM_{10})	14
Particulate Matter ($PM_{2.5}$)	9
Source: South Coast Air Quality Management District, 2003 and 2006.	

LSTs for operational emissions only apply to onsite sources. Since the primary source of emissions for this project is associated with offsite vehicle trips, an LST analysis of long-term emissions is not required.

Nuisance

The SCAQMD has a regulation that governs the discharge from any source such quantities of air contaminants, which cause a nuisance or annoyance to any considerable number of persons or to the public. Creating the potential for a violation of the SCAQMD's Nuisance Rule (Rule 402) would create a potentially significant effect.

4.2.9 - Global Warming Project Level Thresholds

There are several unique challenges to analyzing global warming under CEQA, largely because of its "global" nature. Typical CEQA analyses address local actions that have local – or, at most, regional – impacts, whereas global warming presents the considerable challenge of analyzing the relationship between local and global activities and the resulting potential, if any, for local and/or global environmental impacts. Most environmental analyses examine the "project-specific" impacts that a particular project is likely to generate. With regard to global warming, however, it is generally accepted that the magnitude of global warming effects is so substantial and the contribution of an individual project to global warming is so extremely minuscule that direct significant adverse impacts (albeit not necessarily cumulative significant adverse impacts) would be highly unlikely.

The issue of GHG emissions and global climate change (GCC) is also fundamentally different from any other areas of air quality impact analysis, which are all linked to some region or area in which the

impact is significant. Instead, a global climate change analysis must be conducted on a global level, rather than the typical local or regional setting, and requires consideration of not only emissions from the project under consideration, but also the extent of the displacement, translocation, and redistribution of emissions. In the usual context, where air quality is linked to a particular location or area, it is appropriate to consider the creation of new emissions in that area to be an environmental impact whether or not the emissions are truly "new" emissions to the overall globe. In fact, the approval of a new developmental plan or project does not necessarily create new automobile drivers- the primary source of a land use project's emissions. Rather, new land use projects merely redistribute existing mobile emissions; accordingly, the use of models that measure overall emissions increases without accounting for existing emissions will substantially overstate the impact of the development project on global warming. Overstating the impacts can lead to a misallocation of resources in seeking solutions to GHG emissions and climate change-related problems. This makes an accurate analysis of GHG emissions substantially different from other air quality impacts, where the "addition" of redistributed emissions to a new locale can make a substantial difference to overall air quality.

Generally, the evaluation of an impact under CEQA requires measuring data from a project against a "threshold of significance" (see CEQA Guidelines §15064.7). For global warming, there is not, at this time, an established "threshold of significance" by which to measure an impact. CEQA also requires projects to be evaluated for consistency with "applicable general plans and regional plans" (see CEQA Guidelines §15125(e)). Such plans would include, for example, "the applicable air quality attainment or maintenance plan." These plans involve legislative or regulatory programs applicable to all projects within the region. They establish standards that are independent of the impact analysis described in the CEQA Guidelines (see provisions beginning with Section 15126). The program for GHG emission reductions and maintenance, which ultimately is intended to result from AB 32, would likely constitute such a regional plan when adopted. However, under AB 32, that program does not yet exist and is not expected to be in place for several years. Therefore, there is no local, regional or statewide plan regulating global warming by which the Proposed Alternative Project can be measured. As stated above, OPR asked CARB to recommend a method for setting thresholds of significance. CARB is in the process of establishing GHG thresholds of significance, but they have not yet been adopted at this time.

Notwithstanding these analytical challenges, CEQA Guidelines §15002(a)(1) states that one of the basic purposes of CEQA is to "[i]nform governmental decision makers and the public about the potential, significant environmental effects of proposed activities." Therefore, even if not "typical" under CEQA, this evaluation of the Proposed Alternative Project's potential for contribution to global climate change will analyze that potential in a manner and to an extent reasonably consistent with the policy underpinnings of CEQA.

This analysis is the result of the County's thorough investigation of the impact of the Proposed Alternative Project on global climate change, including a review of Executive Order S-305, AB 32 and the legislative intent behind AB 32, as well as extensive review of scientific literature regarding global

warming and global climate change. Every effort has been made to maximize the disclosure of information to the public, fairly present the potential for significant adverse effects as a result of global warming, and identify the potential to minimize the potential global warming impacts of the Proposed Alternative Project.

It must be noted that there is great disagreement within the scientific community on any given approach. The County cannot, and need not, under CEQA, review every report from an expert or agency, especially since new reports are released on an almost daily basis. The County has, however, reviewed multiple key advisories, comment letters, and white papers from experts, agencies, and groups such as the Climate Action Team, the California Attorney General, the CAPCOA, CARB, the Center for Biological Diversity, the Sierra Club, and the California Chapter of the American Planning Association. Some of these reports urge "zero emission" thresholds, while others advocate against them. Others evaluate multiple thresholds, such as CAPCOA's January 2008 white paper, which analyzes: (1) CEQA with no GHG thresholds; (2) CEQA with a GHG threshold of zero; and (3) CEQA with non-zero thresholds. As stated in the CAPCOA white paper, "[m]any legal and policy questions remain unsettled, including the requirements of CEQA in the context of GHG emissions. This paper is provided as a resource for local policy and decision makers to enable them to make the best decisions they can in the face of incomplete information during a period of change."

After reviewing much of the relevant literature, the County has determined that OPR, as the agency charged with drafting CEQA thresholds, provides the best available guidance.

Given OPR's current reluctance to create a numerical threshold, the County has also not adopted a numerical threshold. OPR's Draft CEQA Guideline Amendments for GHG Emissions state that a lead agency may consider the following three (3) issues in assessing the significance of impacts from GHG emissions:

(1) The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;

(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and

(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The Draft CEQA Guidelines Amendments also state that a lead agency should make a good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions associated with a project, including emissions associated with energy consumption and vehicular traffic. Because the methodologies for performing this assessment are anticipated to evolve over time, a lead agency shall have discretion to determine, in the context of a particular project, whether to use a

model or methodology to quantify GHG emissions or to rely on qualitative or other performance based standards for estimating the significance of GHG emissions. (See Draft CEQA Guidelines Amendments § 15064.4(b).)

CEQA defines a "significant effect on the environment" as a substantial, or potentially substantial, adverse change in the environment (Public Resources Code §21068). With respect to global climate change, no one project can individually create a direct impact on what is a global problem (i.e., no project will, by itself, raise the temperature of the planet).

However, a project may be "cumulatively considerable," meaning "that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of current projects, and the effects of probable future projects" (CEQA Guidelines §15065(a)(3)). OPR's Draft Guideline Amendments add that a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, such as a climate action plan, sustainable community strategy, or statewide plan of mitigation for GHG emissions. (See Draft CEQA Guidelines Amendments § 15064(h)(3)).

Based on: (a) the Legislature's mandate in AB 32; (b) the continued advancements, yet substantial present-day unknowns, in global warming science; (c) the proposed CEQA guidelines prepared pursuant to SB 97; and (d) several published GHG emissions reduction strategies in the scientific literature, the following threshold will be used for the purposes of analyzing the Proposed Alternative Project's potential to contribute to climate change:

- *Whether the Proposed Alternative Project would conflict with the attainment of the State's goals of reducing GHG emissions as dictated by AB 32*. The Proposed Alternative Project will be deemed to have a less-than-significant impact on global climate change on a cumulative basis if (1) it does not result in GHG emissions that are considerable when compared to the existing environmental setting, and (2) it is consistent with emissions reduction strategies included in local, regional, or statewide planning documents and from reputable published sources such as the California Climate Action Team's (CAT) Report to the Governor, CARB Early Action Measures, and OPR's June 19, 2008 Technical Advisory Memorandum.

4.2.10 - Cumulative Impact Thresholds

Section 15130(b) of the CEQA Guidelines states the following:

> The following elements are necessary to an adequate discussion of significant cumulative impacts: Either a list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or a summary of projections contained in an adopted general plan or related planning

document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact.

In accordance with CEQA Guidelines 15130(b), this analysis of cumulative impacts incorporates a summary of projections. The following tiered approach is to assess cumulative air quality impacts. This approach includes the analysis of the following:

- Regional analysis of project air pollutants; and
- Project consistency with existing air quality plans.

4.2.11 - Assessment of the Cumulative Health Effects of the Pollutants

Project Impact Analysis

The following paragraphs analyze the potential impacts of the Proposed Alternative Project on the air quality in the area surrounding the project site. The expected emissions from the construction and operation of the Proposed Alternative Project are calculated as a necessary requisite for assessing the regulatory significance of Proposed Alternative Project emissions on a local and regional level. The paragraphs contain an analysis of the criteria in the CEQA Guidelines regarding air quality as well as an assessment of project conformity with the General Plan.

The Original Proposed Project included 92 residential lots and a 103-slip marina on the 62.43-acre project site. The Proposed Alternative Project reduces the density and intensity of the project with 50 residential lots, a 55-slip marina, and approximately 5.73 acres of dedicated open space in Open Space/Conservation easements.

Short Term Impacts

Short-term impacts will include fugitive dust and other particulate matter, as well as exhaust emissions generated by earthmoving activities and operation of grading equipment during site preparation. Construction emissions are caused by onsite or offsite activities. Onsite emissions principally consist of exhaust emissions (NO_X, CO, VOC, PM_{10}, and $PM_{2.5}$) from heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM_{10}) from disturbed soil. Offsite emissions are caused by motor vehicle exhaust from delivery vehicles, as well as worker traffic, but also include road dust (PM_{10}). Major construction-related activities include the following:

- Grading/clearing, including the excavation;
- Excavation and earth moving for infrastructure construction of the utilities, both on and offsite, and dwelling unit foundations and footings;
- Building construction;
- Asphalt paving of access roads throughout the development; and
- Application of architectural coatings for things such as dwelling stucco and interior painting.

Construction equipment such as scrapers, bulldozers, forklifts, backhoes, water trucks, and industrial saws are expected to be used on the project site and will result in exhaust emissions consisting of CO, NO_X, VOC, PM_{10}, and $PM_{2.5}$. During the finishing phase, paving operations and application of architectural coatings will release VOC emissions. Construction emission can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. For the purposes of determining worst-case emissions and including reasonably foreseeable results, this analysis assumes that only the area of the home site will be graded, with approximately 4 acres being the maximum acreage graded on any one day. Equipment usage was estimated using the Recommended Construction Fleet Calculator created for the Indirect Source Review Regulation (http://www.valleyair.org/ISR/ISRResources.htm). It was assumed that construction equipment would operate for 6 to 8 hours per day and the entire construction period would last for 12 months.

Table 4.2-6 summarizes these construction-related emissions (without mitigation). The emission estimates were derived from the description of the Proposed Alternative Project using the URBEMIS 2002 Version 8.7 emission model. The URBEMIS data files are provided in Appendix A to the Air Quality report.

Table 4.2-6: Short-Term Emissions (Unmitigated)

Source	Emissions (maximum pounds per day)						
	VOC	NO_X	CO	PM_{10} Exhaust	PM_{10} Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Dust
Site Grading	8.09	49.85	68.64	1.81	41.60	1.67	8.74
Building Construction	69.30	53.32	67.76	1.91	0.09	1.76	0.02
Maximum lbs/day	**69.30**	**53.32**	**68.64**	**43.54**		**10.49**	
Regional Threshold	75	100	550	150		55	
Significant Impact?	No	No	No	No		No	
Local Significant Threshold	NA	439	1,363	14		9	
Significant Impact?		No	No	**Yes**		**Yes**	

NA =Not applicable
Source: URBEMIS, MBA 2008.

The information shown in the above table indicates that the SCAQMD regional emission thresholds will not be exceeded by any pollutant, but the locally significant thresholds will be potentially exceeded due to PM_{10} and $PM_{2.5}$ emissions.

Level of Significance before Mitigation

Potentially Significant – Without mitigation, the short-term emissions are considered to have a significant local impact for particulate matter but a less than significant regional impact.

It is important to note that a previous analysis for the Original Proposed Project consisting of 95 total lots on this site had a significant and unavoidable impact to the short-term construction emissions of ROG and NO_X. A review of the analysis showed that the majority of the ROG emissions were assigned to architectural coatings off-gas. Used in the old analysis was the default emissions factor for architectural coating; however, that does not reflect the effect of the SCAQMD's Architectural Coatings Rule (Rule 1113). The majority of the NO_X emissions came from construction equipment exhaust. The updated URBEMIS version uses emission factors that are more up-to-date and more accurately reflect the current fleet of construction equipment. These analytical changes, in addition to the revision of the Proposed Alternative Project to decrease development density and intensity, eliminated the significant short-term air quality impacts identified in the 2005 Final EIR. Although the short-term air quality impact analysis indicates the Proposed Alternative Project will result in a potentially significant localized impact due to PM_{10} and $PM_{2.5}$ emissions, it must be noted that the 2005 Final EIR did not apply the localized significance thresholds in its analysis.

4.2.12 - Construction Mitigation

AQ-1 Prior to construction of the project, the project proponent will provide a Fugitive Dust Control Plan that will describe the application of standard best management practices (BMP) to control dust during construction. The Fugitive Dust Control Plan shall be submitted to the County and SCAQMD for approval and approved prior to construction. Best management practices will include, but not be limited to:

- For any earth moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
- For all disturbed surface areas (except completed grading areas), apply dust suppression in a sufficient quantity and frequency to maintain a stabilized surface; any areas which cannot be stabilized, as evidenced by wind driven dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
- For all inactive disturbed surface areas, apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind-driven fugitive dust, excluding any areas that are inaccessible due to excessive slope or other safety conditions.
- For all unpaved roads, water all roads used for any vehicular traffic once daily and restrict vehicle speed to 15 mph.
- For all open storage piles, apply water to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust.

AQ-2 To reduce emissions from the construction equipment within the project site, the construction contractor will:

- To the extent that equipment and technology is available and cost effective, the contractor shall use catalyst and filtration technologies.
- All diesel-fueled engines used in construction of the project shall use ultra-low sulfur diesel fuel containing no more than 15-ppm sulfur, or a suitable alternative fuel.
- All construction diesel engines, which have a rating of 50 hp or more, shall meet the Tier II California Emission Standards for off-road compression-ignition engines, unless certified by the contractor that such engine is not available for a particular use. In the event that a Tier II engine is not available, Tier I compliant or 1996 or newer engines will be used preferentially. Older engines will only be used if the contractor certifies that compliance is not feasible.
- Heavy-duty diesel equipment will be maintained in optimum running condition.

4.2.13 - Short-Term Construction Emissions after Mitigation

Using the URBEMIS model and applying construction mitigation, short-term emissions of PM_{10} and $PM_{2.5}$ after implementation of the above mitigation measures were estimated and are provided in Table 4.2-7. As shown in Table 4.2-7, short-term localized construction emissions are expected to be less than significant after application of mitigation measures.

Table 4.2-7: Short-term Emissions of PM_{10} & $PM_{2.5}$ (Mitigated)

Source	Emissions (maximum lbs/d)	
	PM_{10}	$PM_{2.5}$
Site Grading	6.57	1.64
Building Construction	6.59	1.65
Maximum lbs/day	**6.59**	**1.65**
Local Significant Threshold	14	9
Significant Impact?	No	No
Source: MBA 2008.		

Level of Significance after Mitigation

Less than significant.

Long-Term Impacts

Long-term emissions for the project site are considered for project build-out. Emission sources consist of mobile emissions and stationary emissions. Mobile emissions estimates are derived from motor vehicle traffic. Stationary emissions estimates are derived from the consumption of natural gas,

electricity and consumer products, as well as emissions resulting from landscape maintenance. Assumptions relevant to model input for the long-term emissions estimates are as follows:

- The project site is assumed to generate 479 average daily trips at buildout of the Proposed Alternative Project (2008);
- Natural gas consumption is based on residential land use;
- Landscape equipment emissions during the summer are based on default rates within the URBEMIS 2002 model for residential land uses at buildout year 2008; and
- Fireplace hearth emissions during the wintertime assume the conservative URBEMIS default that 35 percent of the units would have wood stoves, 10 percent would have wood fireplaces, and 55 percent would have natural gas fireplaces.

Since the proposed project is at an altitude of over 5,000 feet and basic exhaust emission rates are based on tests at CARB's Haagen-Smit Laboratory at an altitude of 300 feet, emission rates from vehicles in the vicinity of the project may not be accurately represented in the URBEMIS calculations. According to CARB's on-road motor vehicle emissions model methodology (CARB 2000), some older technology vehicles emit more VOC and CO emissions and fewer NO_X emissions when at higher altitudes. This is a special concern for vehicles operating above 5,000 feet elevation. At higher altitudes, the air pressure and air density is lower than that at sea level. Older technology vehicles, designed for operation at sea level, were not equipped with adaptive fuel controls to reduce the fuel flow for operation at high altitudes. Hence, older technology vehicles tended to run rich at higher altitudes. This increased VOC and CO emissions but suppressed NO_X formation due to the quenching effect of the excess fuel.

Therefore, CARB established correction factors of 1.3 for VOC, 1.9 for CO, and 0.6 for NO_X that are to be applied to the running exhaust and continuous starting emissions for operation above 5,000 feet. These correction factors are only applicable to older technology gasoline fueled vehicles. Newer technology vehicles have adaptive fuel controls that compensate for higher altitudes. CARB determined the correction factor would only apply to the Technology Groups listed in Table 4.2-8.

Table 4.2-8: Technology Groups with Altitude Correction Factors

Tech Group	Model Years	Technology Group Description
1	Pre-1975	With Secondary Air
2	Pre-1975	Without Secondary Air
3	1975-1982	No Catalyst
4	1975-1976	Oxidation Catalyst with Secondary Air
5	1975-1979	Oxidation Catalyst without Secondary Air
6	1980-1989	Oxidation Catalyst without Secondary Air
7	1977-1987	Oxidation Catalyst with Secondary Air

An analysis of EMFAC2007 for the Basin portion of San Bernardino County for the current year (2007), buildout year (2008), and long-term operations (2030) was conducted. Results of this analysis are presented in Appendix B to the Air Quality Analysis (see Appendix A of this Revised and Recirculated Draft EIR). The number of vehicles operating in these technology groups as a percentage of all vehicles was determined to be only 2.78 percent in 2007, 1.69 percent in 2008, and 0 percent in 2030. Therefore, it was determined that further application of correction factors would not be necessary due to the negligible effect on the total emissions.

An estimate of the daily total long-term project emissions is derived by combining both mobile and stationary emissions (natural gas consumption, consumer product consumption, hearth use, paint applications, and landscape maintenance). Using the model URBEMIS, total daily emissions were estimated for summer and winter. Table 4.2-9 shows long-term estimated daily total summer emissions and Table 4.2-10 shows winter emissions.

In addition, it can be assumed that the future residents would also have personal water craft for use on Big Bear Lake. An estimate of personal water craft emissions was made using the model used by CARB to estimate emissions from off-road motor vehicles (OFFROAD2007) for the year 2010, using San Bernardino County small recreational craft emissions only. The small recreational craft categories were used because Big Bear Municipal Water District Regulationsdoes not allow any craft larger than 26 feet in length on the lake. Total number of craft in San Bernardino County for 2010 is estimated at 22,449. Assuming that each household has one craft, the Alternative would generate 50 craft, which is 0.223 percent of the County's total. OFFROAD emissions are generated on an average yearly basis so Table 4.2-9 and Table 4.2-10 include the average pounds per day of emissions from portion of total emissions that would be generated by 50 watercraft.

Table 4.2-9: Long-Term Emissions (summer)

Pollution Source	Emissions (pounds per day)				
	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$
Mobile Emissions	3.48	6.06	43.49	4.86	1.21
Natural Gas Consumption	0.05	0.63	0.27	NG	NG
Landscape Emissions	0.25	0.01	1.74	0.01	NG
Consumer Products	2.45	NG	NG	NG	NG
Architectural Coatings	1.70	NG	NG	NG	NG
Personal Water Craft	5.84	0.46	11.13	0.68	0.68
Combined Emissions Totals (lbs/day)	**13.77**	**7.16**	**56.63**	**5.55**	**1.89**
Regional Threshold	55	55	550	150	55
Exceed Threshold?	No	No	No	No	No

NG = negligible
Source: URBEMIS, MBA 2008.
1: Big Bear Municipal Water District webpage http://www.bbmwd.org/regulations.htm. Accessed September 20, 2007.

Sources for air quality impacts from the Proposed Alternative Project include particulate and gaseous emissions from construction activities, and are temporary. Some of these activities are controlled by SCAQMD permit conditions and by specified control measures in the District's Best Available Control Technology (BACT) guidelines, which are required before a permit to begin construction may be issued.

Table 4.2-10: Long-Term Emissions (winter)

Pollution Source	Emissions (pounds per day)				
	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$
Mobile Emissions	4.23	7.23	52.66	4.86	1.21
Natural Gas Consumption	0.05	0.63	0.27	NG	NG
Hearth Emissions	28.38	0.98	51.91	7.74	7.12
Consumer Products	2.45	NG	NG	NG	NG
Architectural Coatings	1.70	NG	NG	NG	NG
Combined Emissions Totals (lbs/day)	**36.81**	**8.84**	**104.84**	**12.60**	**7.39**
Regional Threshold	55	55	550	150	55
Exceed Threshold?	No	No	No	No	No

NG = negligible
Source: URBEMIS, MBA 2008.

Level of Significance before Mitigation

Less than Significant – When emissions projections are compared with the SCAQMD suggested regional thresholds for significance, all long-term emissions are below the applicable thresholds.

It is important to note that a previous analysis documented in the 2005 Final EIR for a 92-lot subdivision on this site had a significant and unavoidable impact to the regional levels of ROG, CO, and PM_{10}. A review of the analysis showed that the majority of the emissions were assigned to wood fireplaces. The analysis used the URBEMIS model version available at the time (Version 7G), which has been determined to have had an error in calculating emissions from hearth activities. The emissions calculated for this report used the current version of URBEMIS (Version 8.7), which is considered more reliable.

CO Hotspots

CO is a localized problem requiring additional analysis beyond total project emissions quantification. Projects with sensitive receptors or projects that could negatively impact levels of service (LOS) of existing roads are required to use the University of California Davis, Institute of Transportation Studies document *Transportation Project-Level Carbon Monoxide Protocol (CO Protocol)* (UCD 1997) (hereafter referred to as the CO Protocol) to determine the potential to create a CO hot spot. A CO hot spot is a localized concentration of CO that is above the State or Federal 1-hour or 8-hour

ambient air standards. Localized high levels of CO are associated with traffic congestion and idling or slow-moving vehicles. The Proposed Alternative Project has the potential to negatively impact the LOS on adjacent roadways and, therefore, requires a CO hotspot analysis.

The significance of project-related CO impacts is generally based on guidance presented in the CO Protocol. This document presents a series of criteria that are used to determine the significance of impacts. The impact on CO is considered significant if the project will:

- Degrade operation of an intersection to level of service LOS E or F; or
- Substantially worsen an intersection already operating at LOS F.

For the purposes of determining potential impacts on CO concentrations, a screening procedure was developed to allow the conservative evaluation of CO concentrations without having to run computational models such as EMFAC and CALINE4. Screening procedures provide a relationship among CO concentrations and the most important parameters that affect those concentrations. The screening procedure is contained in the CO Protocol. The Protocol states that the determination of project-level CO impacts should be carried out according to a Local Analysis flow chart.

As presented in the Moon Camp Traffic Impact Analysis (TIA) conducted by Urban Crossroads (2007), affected intersections are projected to operate at a Level of Service "C" or better during peak hours with the improvements listed. According to Section 4.7.2 of the CO Protocol, if the project does not involve any intersections with an LOS "E" or "F," no further analysis is necessary.

However, since the TIA indicates that three of the study intersections are currently operating at a LOS F in 2010 with Proposed Alternative Project without improvements, there is no guarantee that the improvements proposed will actually be constructed within a reasonable time after development of the Proposed Alternative Project. Since these intersections may continue to operate in deficient conditions for some time after opening year of the Proposed Alternative Project, a detailed analysis was conducted on three intersections.

The CARB emission factor model, EMFAC2002, was used to estimate the emission factors for the year 2009. Additional assumptions include approach/departure speed - 5 miles per hour; travel speed - 25 miles per hour; temperature - 40 degrees Fahrenheit; season - winter; and geographical area - South Coast Air Basin.

Using the CALINE4 model, potential CO hotspots were analyzed at the intersections listed in Table 4.2-11. As shown in Table 4.2-11, the estimated 1-hour and 8-hour concentrations, in combination with background concentration, are below the State and Federal ambient air quality standards. No CO hotspots are anticipated as a result of traffic-generated emissions by the Proposed Alternative Project in combination with existing traffic. Therefore, the mobile related emissions are not anticipated to contribute substantially to an existing or projected air quality violation.

Table 4.2-11: Carbon Monoxide Concentrations

Intersection	1-Hour Concentration*	8-Hour Concentration**	Significant Impact?***
North Shore Dr. at Big Bear Blvd.	4.1	3.1	No
North Shore Dr. at Stanfield Cutoff	3.7	2.8	No
Big Bear Blvd. at Stanfield Cutoff	5.0	3.7	No

Source: Project contribution estimated using Caline4; see Appendix G for model output.
* CALINE4 output plus background concentration of 3 ppm (from Table 1)
** CALINE4 output multiplied by a persistence factor of 0.7 (from page 9-11 of the 1993 South Coast Air Quality Management District CEQA Handbook). The background concentration of 2.3 (from Table 1) was then added.
*** Comparison of the 1-hour concentration to the state standard of 20 ppm and comparison of the 8-hour concentration to the state/federal standard of 9 ppm.

Level of Significance before Mitigation

Less than significant.

Residential Woodburning

Wood stoves and fireplaces are reasonably common in the area surrounding Big Bear Lake. Some people use wood as a primary source of heat, and others have wood stoves as a back up in case of emergencies, such as power failures. Wood heating is also popular for cultural reasons when one considers that it can be beneficial because wood is a renewable fuel. However, the smoke from wood stoves and fireplaces pollutes the air outdoors. Smoke from outside can seep into buildings, including nearby homes, also affecting indoor air quality. Smoke from neighborhood stoves and fireplaces, a common source of both odor and reduced visibility, greatly contributes to the air pollution problems people complain about most.

Complete combustion gives off light, heat, and the gases carbon dioxide and water vapor. Because complete combustion does not occur when wood burns, wood smoke is produced which contains CO, NO_X, and ROG. The ROG from woodburning includes toxic and/or cancer-causing substances, such as benzene, formaldehyde and benzo-a-pyrene, a polycyclic aromatic hydrocarbon (PAH).

Most wood heaters, such as woodstoves and fireplaces, release far more air pollution, indoors and out, than heaters using other fuels. In winter, when we heat our homes the most, cold nights with little wind cause smoke and air pollutants to remain stagnate at ground level for long periods. Even though there is no shorter averaging time for particulate matter air quality standards, there is a still a potential for nuisance violations in the area.

Level of Significance before Mitigation

Potentially significant.

Conventional factory-built fireplaces are not efficient at producing heat. These fireplaces are also the source of smoke, indoors and out. To reduce the nuisance risks of smoke – indoor and outside, while still allowing homeowners the ambiance, an EPA-certified fireplace insert is suggested. Additionally, wood heat can be supplied with various EPA-certified wood stoves, pellet stoves, or natural gas heaters. While older uncertified stoves and fireplaces release 40 to 60 grams of smoke per hour, new EPA-certified stoves produce only 2 to 5 grams of smoke per hour.

CARB explains that (CARB 2007) the heating efficiency of any wood heater depends on combining two factors: 1) how completely it burns the firewood (combustion efficiency), and 2) how much of the fire's heat gets into the room, rather than going up the flue (transfer efficiency). The measured heat efficiency of an open-hearth fireplace can range from -10 percent to 10 percent. The heating efficiency of an EPA-certified stove, insert, or fireplace can range from 60 percent to 80 percent.

CARB recommends (CARB 2007) that the owner gets into the habit of glancing out at their chimney top every so often. Apart from the half hour after lighting and refueling, a properly burning fire should give off only a thin wisp of white steam. If they see smoke, they should adjust the dampers or air inlets to let in more air. The darker the smoke, the more pollutants it contains and the more fuel is being wasted.

Homeowners choosing to use fireplaces and woodstoves need to understand that healthy outdoor and indoor air quality requires good wood burning habits. Most fireplaces will rob the house of heat because they draw air from the room and send it up the chimney. Occupants are warmed if they sit within 6 feet of the fire, but the rest of the house gets colder as outdoor air leaks in to replace the hot air going up the chimney. The key to burning clean and hot is to control the airflow. Most fireplaces waste wood because of unrestricted airflow. A lot of air helps the fire burn fast, but a load of wood will last only one or two hours.

Residential Woodburning Mitigations

AQ-3 To reduce the emissions from woodburning apparatus; the following requirement will be placed on all new residences constructed on the proposed project's lots:

- No open-hearth fireplace will be allowed in new construction, only EPA Phase II Certified fireplaces and wood stoves, pellet stoves, and natural gas fireplaces shall be allowed.

AQ-4 To establish a "Good Neighbor Policy for Burning" that will further help reduce the potential for localized nuisance complaints related to woodburning; the proponent shall distribute an informational flyer to each purchaser of lots. At a minimum, the flyer will say:

KNOW WHEN TO BURN

- Monitor all fires; never leave a fire unattended.
- Upgrade an older woodstove to one with a catalytic combustor that burns off excess pollutants.

- Be courteous when visitors come to your home. Wood smoke can cause problems for people with developing or sensitive lungs (i.e. children, the elderly) and people with lung disease.

KNOW WHAT TO BURN

- Split large pieces of wood into smaller pieces and make sure it has been seasoned (allowed to dry for a year). Burning fresh cut logs = smoky fires.
- When buying wood from a dealer, do not assume it has been seasoned.
- Small hot fires are more efficient and less wasteful than large fires.
- Never burn chemically treated wood or non-wood materials.
- Manufactured fire logs provide a nice ambience, have the least impact to air quality, and are a good choice for homeowners who use a fireplace infrequently.

KNOW HOW TO BURN

- Proper combustion is key. Make sure your wood fire is not starved; if excess smoke is coming from the chimney or stack, the fire isn't getting enough air.
- Visually check your chimney or stack 10 to 15 minutes after you light a fire to ensure it is not emitting excess amounts of smoke.
- Homeowners should have woodstoves and fireplaces serviced and cleaned yearly to ensure they are working properly.

Level of Significance after Mitigation

Less than Significant.

Conformance with Air Quality Management Plan

The CEQA checklist indicates that a significant impact would occur if a proposed project would conflict with or obstruct implementation of the applicable air quality plan.

This assessment will use four criteria for determining consistency of the Proposed Alternative Project with the current AQMP, as discussed below. The first and second criteria are from the SCAQMD. According to the SCAQMD, there are two key indicators of AQMP consistency: 1) whether the project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP; and 2) whether the project will exceed the assumptions in the AQMP based on the year of project build out and phase (SCAQMD 2006b). The third criterion is compliance with the control measures in the AQMP. The fourth criterion is compliance with the SCAQMD regional thresholds.

Project's Contribution to Air Quality Violations

As shown in discussion Section 4.2.13 and 4.2.14 of Short and Long-Term Impacts, the Proposed Alternative Project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, the Proposed Alternative Project meets the first indicator.

AQMP Assumptions

One way to assess project compliance with the AQMP assumptions is to ensure that the population density and land use are consistent with the growth assumptions used in the air plans for the air basin. According to CARB transportation performance standards, the rate of growth in vehicle miles traveled (VMT) and trips should be held to the rate of population growth (SCAQMD 2006b). Compliance with this performance standard is one way suggested by CARB of showing compliance with the growth assumptions used in the AQMP. If the total VMT generated by a proposed project at build-out is at or below that predicted by the AQMP, then the project's mobile emissions is consistent with the AQMP. It is assumed that the existing and future pollutant emissions computed in the AQMP were based on land uses from area general plans.

Under the existing zoning of the project site, only one lot would be allowed on the 62.43 acres. The Proposed Alternative Project would allow 50 lots in the same area. This would result in a net increase of 487 trips per day above the current general plan expected growth. The TIA provided an estimation of daily traffic generated by projects planned in the area in 2030. The results indicate that the other developments' daily trip generation would be 15,111 in 2030. The Proposed Alternative Project traffic generation in 2030 would be 497 trips per day, for a total of 15,608 total trips per day, including the Proposed Alternative Project. This represents just over 3 percent of the projected cumulative growth. Whereas the increase above the parcel alone will be considerable, the relative increase above the vicinity general plan projection is minimal. Therefore, the Proposed Alternative Project is consistent with the assumptions in the AQMP.

Control Measures

The third criterion is compliance with the control measures in the AQMP. The AQMP contains a number of land use and transportation control measures including the following:

- The District's Stationary and Mobile Source Control Measures;
- State Control Measures proposed by CARB; and
- Transportation Control Measures provided by SCAG (AQMP 2003).

CARB's strategy for reducing mobile source emissions includes the following approaches:

- New engine standards;
- Reduce emissions from in-use fleet;
- Require clean fuels, support alternative fuels;
- Reduce petroleum dependency;

- Work with EPA to reduce emissions from national and state sources; and
- Pursue long-term advanced technology measures (AQMP 2003).

Transportation control measures provided by SCAG include those contained in the Regional Transportation Plans (RTP); the most current version is the 2004 RTP. The RTP has control measures to reduce emissions from on-road sources by incorporating strategies such as high occupancy vehicle interventions, transit, and information-based technology interventions (AQMP 2003). The measures implemented by CARB and SCAG affect the project indirectly by regulating the vehicles that the residents may use and regulating public transportation. The Proposed Alternative Project indirectly will comply with the control measures set by CARB and SCAG.

Since the SCAQMD's rules and regulations are mandatory and enforceable, the Proposed Alternative Project will comply with all of the District's applicable rules and regulations. Therefore, the Proposed Alternative Project complies with this criterion.

Compliance with the SCAQMD Regional Thresholds

Although there is no known guidance that correlates AQMP consistency with the SCAQMD regional thresholds, it is common to use the thresholds in assessing AQMP compliance.

The regional significance analysis of construction and operational emissions demonstrated that emissions would not exceed the SCAQMD regional significance thresholds. Therefore, the Proposed Alternative Project is consistent with the SCAQMD regional thresholds.

Level of Significance before Mitigation

Less than Significant.

4.2.14 - Potential for Air Quality Standard Violation

The CEQA Guidelines indicate that a project would have a significant impact if it would violate any air quality standard or contribute substantially to an existing or projected air quality violation.

The South Coast Air Basin, the geographical area in which the project is located, is in nonattainment for CO, PM_{10}, $PM_{2.5}$, and ozone. Levels of PM_{10} and $PM_{2.5}$ are locally high enough that contributions from new sources may add to the concentrations of those pollutants and contribute to a projected air quality violation. Although background levels of ozone are high in the basin, the project alone (without other cumulative sources) would not contribute substantially to a projected air quality violation of ozone. Project emissions of VOC and NO_X (ozone precursors) and their cumulative contribution to ozone concentrations are discussed in Cumulative Impacts below.

Although CO is still listed as a nonattainment pollutant, the basin has not exceeded the CO standard for the past several years. Additionally, as shown in Table 4.2-11, the Proposed Alternative Project's source receptor area has not violated the CO standard for the past several years.

Two criteria are used to assess the significance of this impact: 1) the localized construction analysis; and 2) the CO hotspot analysis. These analyses are discussed above and have concluded that they would result in a less than significant impact.

Particulate matter emissions during operation (PM_{10} and $PM_{2.5}$) are primarily from paved road dust and fireplaces. It is not likely that the Proposed Alternative Project would generate enough paved road dust during operation to violate a PM_{10} or $PM_{2.5}$. Also, it is not likely that particulate matter emissions from woodburning devices in an entire day would be enough to violate the 24-hour standards for either PM_{10} or $PM_{2.5}$. In addition, the regional significance analysis demonstrated that emissions of PM_{10} and $PM_{2.5}$ are below the regional significance thresholds.

Sulfur dioxide emissions from the Proposed Alternative Project are negligible. The regional analysis demonstrated that emissions are far under the regional significance threshold. Therefore, it follows that on a localized basis, emissions of sulfur dioxide would not exceed the ambient air quality standards. In addition, the basin is in attainment for sulfur dioxide and does not experience high pollutant episodes of that pollutant. Therefore, potential impacts of sulfur dioxide are less than significant.

Level of Significance before Mitigation

Less than Significant.

Contribution to Climate Change

The threshold of significance proposed in this document is not simply if the Proposed Alternative Project would result in an increase in GHG emissions, but if the Proposed Alternative Project would result in an increase in GHGs that would significantly hinder or delay the State's ability to meet the reduction targets contained in AB 32.

Consistent with the mandates of AB 32, SB 97, and the OPR Technical Advisory Memorandum and its guidance on providing analysis of global climate change in CEQA documents, the Proposed Alternative Project's cumulative impact on global climate change has been based on the following methodology:

- Calculation of GHG emissions. This step is for informational purposes, and will be used to determine whether the Proposed Alternative Project's emissions are considerable when compared to the existing environment.
- Incorporation of GHG Emission Reduction Strategies. If a project incorporates design features that assist in achieving increased energy efficiencies and in so doing reduces GHG emissions levels from the status quo, then the project's cumulative impact on global climate change is considered less-than-significant.

Emissions Estimation Assumptions

Construction. The Proposed Alternative Project would emit GHGs, during construction, from combustion of fuels in worker vehicles accessing the site as well as from the construction equipment. Exhaust emissions during construction for the Proposed Alternative Project were estimated using URBEMIS2007 version 9.2.4 (URBEMIS 2007). The detailed calculations are provided in Appendix E of the Air Quality Analysis.

Operation. GHG emissions from area emissions and motor vehicles were generated using URBEMIS 2007. Emissions of nitrous oxide and methane emissions from natural gas consumption were estimated using emission factors as described in the attached spreadsheets in Appendix E of the Air Quality Analysis.

Electricity usage for commercial operations was estimated using emission factors as described in the attached spreadsheets in Appendix E. The California Climate Action Registry (CCAR) emission factors for electricity use are 804.54 pounds of CO_2 per MWh, 0.0067 pounds of NH_4 per MWh, and 0.0037 pounds of N_2O per MWh.

Note that emissions models such as EMFAC and URBEMIS evaluate aggregate emissions and do not demonstrate, with respect to a global impact, how much of these emissions are **"**new**"** emissions specifically attributable to the proposed project. For most projects, the main contribution of GHG emissions is from motor vehicles, but how much of those emissions are **"**new**"** is uncertain.

Emissions Inventory

The emissions are estimated in tons per year, which are converted to metric tons of carbon dioxide equivalents ($MTCO_2e$). The carbon dioxide emissions from construction activity are shown in Table 4.2-12. The GHG emissions from operation of the Proposed Alternative Project are shown in Table 4.2-13. At buildout, the Proposed Alternative Project will emit approximately 1,591.60 $MTCO_2e$ per year. Approximately 82 percent of operational GHGs will be generated by vehicular activity associated with the Proposed Alternative Project . Natural gas use and indirect emissions from electricity generation will contribute approximately 11 percent and 6 percent of the operational GHG inventory, respectively.

Table 4.2-12: Construction Generated Carbon Dioxide Emissions

Source	Total tons	$MTCO_2e$
Project Construction	401.22	363.99
Source: Michael Brandman Associates, 2008		

Table 4.2-13: Operational Greenhouse Gas Emissions

Source	Tons			Metric Tons CO_2e
	Carbon Dioxide	Nitrous Oxide	Methane	
Motor Vehicles	1,378.00	0.18	0.39	1,309.49
Natural Gas	189.75	0.00	0.02	172.67
Indirect Electricity	113.17	0.00	0.00	102.83
Hearth	6.63	—	—	6.01
Landscape Equipment	0.65	—	—	0.59
Total	**1,688.20**	**0.19**	**0.41**	**1,591.60**
Source: Michael Brandman Associates, 2008				

Energy Efficient Design Features

The Proposed Alternative Project would be developed with many construction and design attributes that would facilitate increases in energy efficiencies and a corresponding decrease in GHG emissions. The following design attributes and elements of the Proposed Alternative Project have been formulated based on the following fundamental objectives:

- Conservation of natural resources;
- Wise use of energy;
- Improvement of indoor air quality; and
- Achievement of livable communities

Community Design and Planning

Incorporate the following design and planning features as practical:

- Subdivision Layout & Orientation to Improve Natural Cooling and Passive Solar Attributes – summer temperatures in neighborhoods that have large expanses of pavement exposed to the sun can be several degrees warmer than neighborhoods with shaded pavement. Homes shall be oriented to take advantage of solar access to provide passive solar heat in the winter and minimize solar heat in the summer months. Planning strategies that consider solar access can address these concerns.

Site Design

Incorporate the following site design features as possible and practical:

- Protect Topsoil from Erosion and Reuse after Construction – Soil is a valuable, living resource that should be protected. Through careful planning and construction practices, valuable soil as well as mature trees and other plants can be preserved.

- Limit and Delineate Construction Footprint for Maximum Protection – Limit and delineate the construction footprint; restrict heavy equipment that compacts soil, including cars, to areas that are or will be paved or built over. Identify areas to be paved as a place to store existing topsoil, if topsoil needs to be removed from an area during construction. Protect stored soil from erosion.
- Recycle Construction Waste (Including Green Waste) – Each year close to nine million tons of construction and demolition (C&D) debris is disposed of in California landfills. This represents 22 percent of the statewide waste stream, but in newer communities, C&D waste sent to landfills can be as high as 50 percent. Construction waste generally consists of wood, drywall, metal, concrete, dirt, and cardboard. It can also include plant debris (green waste) from the landscape. Much of this material can be reused or recycled.
- Use Recycled-Content Aggregate (Minimum 25 percent) – Recycled concrete and asphalt crushed to 3/4-inch meets the California Department of Transportation's (Caltrans) specification for Class 2 Aggregate Base.
- Design windows to catch prevailing breezes and provide cross ventilation – Install high windows, skylights, or cupolas with securable low windows to create a stack effect that exhausts rising hot air and draws in cooler outdoor air.
- Install energy-efficient windows (double-paned, low-conductivity frames, and low-e coating) – There are two types of low-e glazing. One is heat rejecting (hard coat) and the other is heat receiving (soft coat). The recommended south glazing for passive solar buildings is low-e hard coat, heat receiving glazing with a U-factor of 0.40 or lower and a solar heat gain coefficient (SHGC) of 0.65 or higher.

Foundation

- As practical or feasible, replace Portland Cement in Concrete with Recycled Flyash or Slag – Flyash is a byproduct of coal-burning power plants. It is typically landfilled, but can be an inexpensive and quality substitute for a portion of the Portland cement in concrete. Concrete suppliers routinely replace 10 to 15% of the Portland cement in their mixes with flyash. Slag, a byproduct of the steel industry, may also be used like flyash to replace some of the cement.

Landscaping

As practical or feasible, incorporate the following measures into landscape design:

- Minimize Turf Areas in Landscape Installed by Builder – Lawns (or turf) are useful for recreation and relaxation, but turf requires frequent cutting, watering and application of fertilizers or other chemicals to stay green during California's long dry season.
- Install High-Efficiency Irrigation Systems, such as Drip, Bubblers, or Low-flow Sprinklers or Smart Controllers – With increasing demand on supplies of fresh water, efficient landscaping irrigation is vital in California. Efficient irrigation systems apply only the amount of water that the plants need, with little or no waste through runoff, over watering, or misting.
- Incorporate Two Inches of Compost into the Top 6 to 12 Inches of Soil – A robust, living soil with sufficient organic content is the foundation of a water-conserving, resource-efficient,

thriving landscape. Adding good quality compost before planting brings life to the soil and feeds existing soil organisms, fueling many natural processes that supply nutrients, minimize disease, and improve soil quality.

Structural Frame and Building Envelope

As practical and feasible, incorporate the following features into residential construction:

- Structural Frame & Building Envelope;
  - Reduce Pollution Entering the Home from the Garage by providing a Tightly Sealed Air Barrier between Garage and Living Area, Install Garage Exhaust Fan, or Build a Detached Garage – According to the U.S. EPA, an attached garage is the biggest contributor to poor indoor air quality in a home. Car exhaust contains many known carcinogens and can migrate into living spaces through doors and cracks in walls and ceilings adjacent to the garage. Other pollutants commonly found in garages include benzene from lawn mowers and power tools, pesticides for gardens, toxic cleaning agents, and chemicals in paints and adhesives.
  - Use wall materials that improve thermal mass – Low cost strategies for thermal mass walls include using 5/8" drywall on all interior surfaces. Less conventional approaches include using pre-cast insulated concrete walls or insulated concrete forms (ICFs).
- Exterior Finish
  - ***Use Durable and Noncombustible Siding Materials*** – Sidings made of metal, stone, brick, stucco and fiber-cement offer a durable and noncombustible home exterior.
  - ***Use Durable and Noncombustible Roofing Materials*** – Forty- to fifty-year asphalt shingles, tile, slate, fiber-cement, recycled plastic and metal are examples of durable roofing materials. A Class A fire rating offers a home the highest in fire protection.
- Insulation
  - ***Install Insulation with 75 Percent Recycled Content in Walls***, Floors, and/or Ceilings – Fiberglass insulation typically contains 25 to 30 percent recycled glass, with a combination of post-industrial and post-consumer content. Materials such as recycled cotton or cellulose insulation contain up to 80 percent post-industrial or post-consumer recycled materials.
  - ***Install Insulation That Is Low-Emitting (Certified CA Section 01350)*** – Many insulation products emit formaldehyde and other VOCs. Look for products that have been tested for low emissions by a reputable third-party organization or government agency.
- Plumbing
  - Distribute Domestic Hot Water Efficiently by either: Insulating Hot Water Pipes from Water Heater to Kitchen, Insulating All Hot Water Pipes, or use other Engineered Piping – Locating the water heater close to usage points reduces heat loss, speeds the rate of hot water delivery, and reduces water wasted while waiting for hot water to arrive at a

plumbing fixture. For larger houses, an on-demand hot water circulation pump may reduce waiting time without wasting energy.

- Install Only High Efficiency Toilets (Dual-Flush or 1.3 gpf) – Standard new toilets use 1.6 gallons per flush (gpf). Toilets that use less than 1.3 gpf are called High Efficiency Toilets (HETs). HETs are available in dual-flush, pressure-assist, and conventional gravity-flush models.
- Plumbing Fixtures with Below Standard Flow Rates – (Bath faucets <1.5 gal/min & showers <x.0 gal/min). Along with aerators, flow restrictors can reduce water consumption by 13 percent.

- Heating, Ventilation, & Air Conditioning
  - ***Install Sealed Combustion Units in Furnaces and Water Heaters*** – Sealed combustion furnaces and water heaters duct outdoor air directly into a sealed jacket around the combustion chamber and then vent it directly outdoors, eliminating the use of house air for combustion.
  - ***Install Zoned, Hydronic Radiant Heating with Slab Insulation*** – Instead of providing warm air via ducts, hydronic radiant heating systems circulate hot water through under-floor tubing, wall radiators, or baseboard convectors.
  - ***Install High Efficiency Air Conditioning with Environmentally Responsible Refrigerants*** – Energy-efficient air conditioning equipment saves homeowners money and reduces demand for electricity from power plants. Environmentally sound refrigerants reduce the risk of damage to the ozone layer.
  - ***Design and Install Effective Ductwork*** – Poorly designed and installed ductwork lowers heating and cooling system efficiency and capacity, and can contribute to poor indoor air quality and comfort problems.
  - ***Install High Efficiency HVAC Filter (MERV 6+)*** – HVAC filters remove particulates from the air. Minimum Efficiency Reporting Value (MERV) is a metric used to measure an air filter's efficiency. The MERV scale ranges from 1 to 20. The higher the MERV number, the more efficient the filter is at removing particles.
  - ***Install Effective Exhaust Systems in Bathrooms and Kitchens such as Install Energy Star® Bathroom and Kitchen Fans Vented to the Outside and All Bathroom Fans Are on Timer or Humidistat*** – Bathrooms and kitchens produce odors and a lot of moisture that can cause mold and other problems if the rooms are not properly ventilated. Gas ovens and cooktops produce carbon monoxide, nitrogen dioxide and other pollutants. Additionally, cooking food produces odors and particulates.
  - ***Install Mechanical Fresh Air Ventilation Systems, such as Any Whole House Ventilation System That Meets ASHRAE 62.2*** – Ceiling fans improve a home's comfort by circulating air. Energy Star®–qualified models are energy efficient thanks to improved motors, blade designs and fluorescent light kits; also, they can be operated to either draw warm air upward in the summer or push it downward in the winter.

- ***Install Carbon Monoxide Alarms*** – CO is emitted from fuel-burning appliances such as stoves, cooktops, water heaters, furnaces, and fireplaces, as well as from cars and some landscape equipment. If a home is tightly built for energy efficiency but has leaky HVAC ducts, the air leaks may depressurize the home and reverse the flow of exhaust vent pipes. This can introduce carbon monoxide from fuel-burning appliances back into the home, a process known as backdrafting.

- Finishes
  - ***Use Low-VOC or Zero-VOC Paint*** – Most interior paints contain VOCs, a major class of indoor and outdoor air pollutants. Besides affecting indoor air quality, certain VOCs react with other chemicals in the atmosphere, producing ground-level ozone (smog) that can affect human health. Low- and zero-VOC paints reduce these sources of pollution.
  - ***Use Recycled-Content Paint*** – A number of manufacturers have developed high-quality recycled content latex paint and primers. The recycled portion (ranging from 20 percent to 100 percent) comes from unused consumer or industrial stock, as well as paint recovered from household hazardous waste collection facilities. The paint is checked for quality and then sent to paint manufacturers for recycling and blending with a portion of new paint.
  - ***Reduce Formaldehyde in Interior Finishes (CA Section 01350)*** – Formaldehyde is often used as a binder in home-building products such as plywood, particleboard, and other composite wood products. These binders come in two basic forms: urea and phenol. Urea-formaldehyde binders are common in interior-grade products. Phenol-formaldehyde binders are used in exterior applications because they are more water resistant. This water resistance quality makes phenolic glues off gas more slowly and in lower quantities than urea glues, reducing some of the harmful effects on indoor air quality.

Conclusion

As discussed previously, the methodology used in this EIR to analyze the Proposed Alternative Project's potential effect on GCC includes a calculation of GHG emissions for informational purposes, as there is no quantifiable emissions threshold currently defined. Although AB 32 requires GHG emissions to be reduced to 1990 levels by 2020, it does not require CARB to develop a plan to accomplish this reduction until 2011. Though CARB is diligently moving forward to develop this plan, until it has published and adopted its 1990 emissions inventory, there is no "air quality standard" by which to judge a project's contribution to GCC under CEQA Guidelines, Appendix G. Similarly, the PCC notes that there is little consensus as to the ultimate impact of human interference with the climate system and its causal connection to global warming trends.

Accordingly, the potential of the Proposed Alternative Project to create an impact on GCC is based on whether the Proposed Alternative Project would conflict with the attainment of the state's goals of reducing GHG emissions as dictated by AB 32. The Proposed Alternative Project will not interfere

with the state's goals of reducing GHG emissions to 1990 levels by the year 2020 as stated and an 80-percent reduction in GHG emissions below 1990 levels to 2050. As discussed herein, the Proposed Alternative Project will generate a limited amount of GHG generation during construction, and it will lead to a low amount of on-going operational emissions from the use of the 50 residential units. The Proposed Alternative Project would emit less than 25 percent of the SCAQMD's draft numerical GHG threshold of significance (currently proposed as 6,500 $MTCO_2e$). Moreover, the Proposed Alternative Project will utilize high-efficiency design features that will even further reduce consumption of electricity, natural gas, and will result in a corresponding reduction in GHG emissions. Therefore, the Proposed Alternative Project will not significantly hinder or delay California's ability to meet the reduction targets contained in AB 32.

4.2.15 - Cumulative Impacts

Section 15130(b) of the CEQA Guidelines states the following:

> The following elements are necessary to an adequate discussion of significant cumulative impacts, either:
>
> - A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or
> - A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document, which has been adopted or certified, which described or evaluated regional or areawide conditions contributing to the cumulative impact.

In accordance with CEQA Guidelines 15130(b), this analysis of cumulative impacts incorporates a summary of projections. The following four-tiered approach is to assess cumulative air quality impacts;

- Consistency with the SCAQMD project specific thresholds for construction and operation;
- Project consistency with existing air quality plans;
- Assessment of the cumulative health effects of the pollutants; and
- Cumulative impact of global climate change.

Project Specific Thresholds

After implementation of mitigation measures, during construction, emissions of VOC, NO_X, PM_{10}, and $PM_{2.5}$ are not expected to exceed the SCAQMD regional significance thresholds. In addition, during operation, the Proposed Alternative Project is not expected to exceed the established regional emission thresholds for VOC, NO_X, CO, PM_{10}, and $PM_{2.5}$. The SCAQMD considers construction or operational emissions that do not exceed the project specific thresholds will not result in a cumulative impact. Design features that reduce the emissions generated by motor vehicles, natural gas consumption, and electricity consumption will reduce the main operational sources of GHGs, as more fully outlined above. Although the Proposed Alternative Project is not of sufficient size to create a significant

impact to global warming, incorporation of the above recommended design features will further reduce the Proposed Alternative Project's cumulative impact in this area. These design features were developed using the "New Home Construction Green Building Guidelines," 2007 Edition and "Build It Green." March 2007.

Level of Significance before Mitigation

Less than significant.

Air Quality Plans

The Basin, in which the project is located, is in nonattainment for ozone, PM_{10}, $PM_{2.5}$, and CO. As such, the SCAQMD is required to prepare and maintain an AQMP and a SIP to document the strategies and measures to be undertaken to reach attainment of ambient air quality standards. While the SCAQMD does not have direct authority over land use decisions, it was recognized that changes in land use and circulation planning were necessary to maintain clean air. As discussed above, Conformance with Air Quality Management Plan, the Proposed Alternative Project is compliant with the AQMP.

Level of Significance before Mitigation

Less than significant.

Cumulative Health Impacts

The basin is in nonattainment for ozone, PM_{10}, $PM_{2.5}$, and CO, which means that the background levels of those pollutants are at times higher than the ambient air quality standards. The air quality standards were set to protect the health of sensitive individuals (i.e., elderly, children, and the sick). Therefore, when the concentration of those pollutants exceed the standard, it is likely that some of the sensitive individuals of the population could experience health effects as indicated above in Table 4.2-1.

The localized significance analysis for the Proposed Alternative Project demonstrated that during construction activities, no localized significance threshold was expected to be exceeded; therefore, the emissions of particulate matter, primarily in the form of fugitive dust, would not result in a significant cumulative health impact with implementation of the identified mitigation measures.

Long-term operational emissions are not expected to exceed the District's significance thresholds. ROG and NO_X are precursors to ozone. Because ozone is a secondary pollutant (it is not emitted directly but formed by chemical reactions in the air), it can be formed miles downwind of the project site. Proposed Alternative Project emissions of VOC and NO_X may still contribute to the background concentration of ozone but such contributions would not be considered cumulatively considerable.

Operational emissions of PM_{10} and $PM_{2.5}$ are not expected to exceed the regional significance threshold. The combination of ozone and PM_{10} can aggravate health effects. $PM_{2.5}$ is a component of

PM_{10}. The ambient air quality standard for both PM_{10} and $PM_{2.5}$ are exceeded in the Basin. Therefore, Proposed Alternative Project emissions may contribute to the background of those pollutants but such contributions would not be considered cumulatively considerable.

The long-term impacts of wood burning in hearths and fireplaces can potentially emit smoke and toxic air contaminant through the incomplete combustion of the wood products. Such emissions could also impact indoor air quality particularly during winter when adequate ventilation and air exchanges would be at a minimum. These smoke and TAC emissions could contribute to an overall increase in smoke in the area encompassing and surrounding the proposed project site.

Level of Significance before Mitigation

Potentially significant.

Long-term health effects from residential wood burning are not expected to create a significant impact with the implementation of Mitigation Measures AQ-3 and AQ-4. Implementation of these measures would minimize the generation of local wood smoke from wood burning, such that their contribution would not be considered cumulatively considerable.

Level of Significance after Mitigation

Less than significant.

Expose Sensitive Receptors to Substantial Pollutant Concentrations

The CEQA Guidelines indicate that a significant impact would occur if a proposed project would expose sensitive receptors to substantial pollutant concentrations.

The localized construction analysis demonstrated that without mitigation, the Proposed Alternative Project would not exceed the localized thresholds for CO, NO_2, PM_{10}, or $PM_{2.5}$. Therefore, during construction, the Proposed Alternative Project would not expose sensitive receptors to substantial pollutant concentrations of CO, NO_2, PM_{10}, or $PM_{2.5}$.

The construction equipment would emit diesel particulate matter, which is a carcinogen. However, the diesel particulate matter emissions are short term in nature. Determination of risk from diesel particulate matter is considered over a 70-year exposure time. Therefore, considering the dispersion of the emissions and the short time frame, exposure to diesel particulate matter is anticipated to be less than significant.

During operation of the Proposed Alternative Project, a CO hotspot analysis is the appropriate tool to determine if project emissions of CO during operation would exceed ambient air quality standards. The main source of air pollutant emissions during operation are from offsite motor vehicles traveling on the roads surrounding the project. The study area intersections were projected to operate at a Level of Service "C" or better during peak hours with the improvements listed in the TIA. According to

Section 4.7.2 of the CO Protocol, if a project does not involve any intersections with an LOS "E" or "F", no further analysis is necessary. Therefore, according to this criterion, air pollutant emissions during operation of the Proposed Alternative Project would result in a less than significant impact.

During operation of the Proposed Alternative Project, the addition of woodburning devices to the area would potentially expose sensitive receptors to localized concentrations of criteria and toxic pollutants. With the implementation of mitigation measures identified above, the Proposed Alternative Project would not expose sensitive receptors to substantial pollutant concentrations.

Level of Significance before Mitigation

Less than significant.

4.2.16 - Odors

The CEQA Guidelines indicate that a significant impact would occur if a proposed project would create objectionable odors affecting a substantial number of people.

The Proposed Alternative Project does not contain land uses typically associated with emitting objectionable odors, with the possible exception of wood smoke. Wood smoke is pleasant to some and may be a nuisance to others. Implementation and compliance with SCAQMD Rule 402 would ensure that wood smoke would not be offensive to a substantial number of people. Diesel exhaust and VOCs will be emitted during construction of the Proposed Alternative Project, which are objectionable to some; however, emissions will disperse rapidly from the project site and therefore should not be at a level to induce a negative response.

Level of Significance before Mitigation

Less than significant.

4.3 - Biological Resources

4.3.1 - Introduction

This section describes the biological character of the project site in terms of plants, wildlife, and wildlife habitats and analyzes the biological significance of the site in view of federal (FESA), state (CESA), and local laws and policies. This section evaluates the potential impacts to biological resources on-site and in the vicinity of the project site and recommends mitigation measures, where feasible, to reduce the significance of impacts that are identified.

All biological studies were conducted in accordance with accepted scientific and technical standards that are consistent with the requirements of the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG). The following reports were used in the preparation of this section and are included in Appendix B:

- Results of Bald Eagle Survey on Tentative Tract 16136, Moon Camp, Fawnskin, San Bernardino County, California (2002),
- Focused Flying Squirrel Trapping Report Moon Camp Project, Fawnskin, San Bernardino, California (2007),
- Southern Rubber Boa Letter Report from Glenn Stewart of the Biological Sciences of California State Polytechnic University of Pomona (2007),
- Southwestern Willow Flycatcher Focused Survey Report Moon Camp Project, Fawnskin, San Bernardino County, California (2007),
- Moon Camp Tentative Tract 16136 Supplemental Focused Rare Plant Survey (2008),
- Moon Camp Property, Fawnskin Area: Vegetation and Special Status Plants (2009),
- Bald Eagle Count in Area, Moon Camp, Fawnskin, San Bernardino County, California (2009).

4.3.1 - Existing Conditions

The Moon Camp project site (Tentative Tract No. 16136) is located approximately midway along the north shore of Big Bear Lake, at the eastern edge of the community of Fawnskin. The 62.43-acre site slopes upward from the lakeshore and State Route 38 (SR-38) (Lakeshore Drive) from a lake surface elevation of approximately 6,747 feet above mean sea level (msl) to approximately 6,960 feet msl at the northeast boundary. Slopes vary from 5 to 40 percent and continue upward beyond the property to a ridgeline exceeding 7,800 feet msl on the north. The on-site variation in elevation is approximately 213 feet.

Vegetation Communities

Plant communities in California have generally been classified by biologists either according to Holland's Preliminary Descriptions of the Terrestrial Natural Communities of California (1986) or

Sawyer and Keeler-Wolf's A Manual of California Vegetation (1995). Holland's descriptions were developed as part of CDFG's California Natural Diversity Database (CNDDB), and Sawyer and Keeler-Wolf's manual was developed through the California Native Plant Society (CNPS). The CDFG now has a list of terrestrial natural communities which supersedes all other lists developed by the CNDDB. It is based on Sawyer and Keeler-Wolf's manual but it is also structured to be compatible with previous CNDDB lists such as Holland. Wherever applicable the plant communities are classified according to CDFG's list of terrestrial natural communities (2003) and cross-referenced to Holland's element code. Disturbed and developed areas are described according to industry standard descriptions. The CDFG does not currently have a narrative description of these vegetation communities; therefore, the descriptions provided below are according to Holland.

Four vegetation types occur within the project site. Exhibit 4.3-1, *Plant Communities Map*, illustrates their distribution and Table 4.3-1 summarizes the extent of vegetation types present within the project site. Each of the vegetation types observed during field surveys are described below.

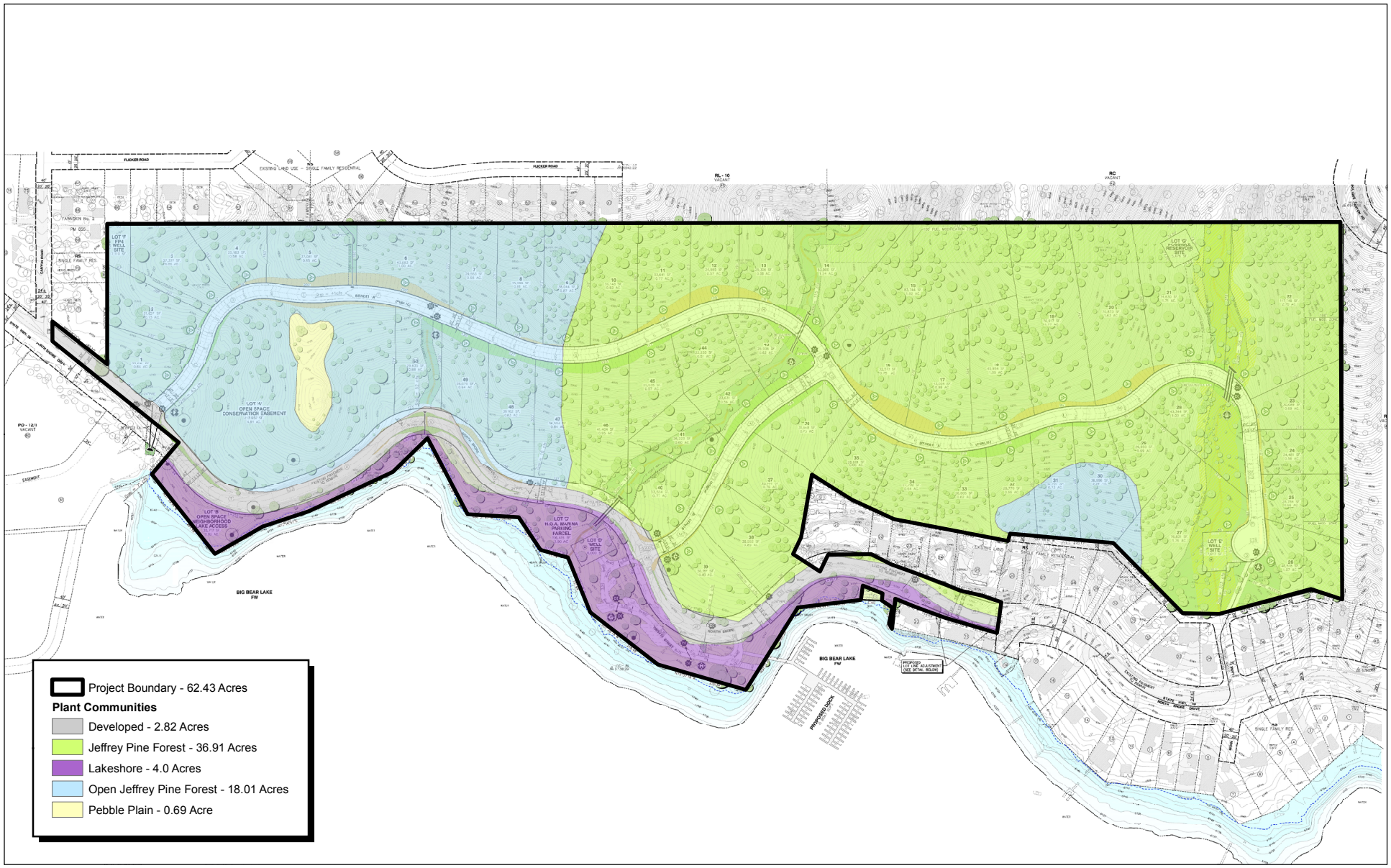
Table 4.3-1: Existing Vegetation Types on the Project Site

Vegetation Type	Acreage
Jeffrey Pine Forest	54.92
Pebble Plain	0.69
Lake Shoreline/ Ruderal	4.0
Developed (SR-38)	2.82
Total	**62.43**

Jeffrey Pine Forest

Jeffrey pine forest occurs on 54.92 acres of the eastern half of the project site. This area is dominated by Jeffrey pine (*Pinus jeffrey*i) with white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis)*, singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occurring at lower densities. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), Greg's ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus leucodermis*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches. Jeffrey pine forest occurs at elevations ranging from 3,200 to 7,800 feet above msl in southern California.

Open Jeffrey pine forest is shown as a separate vegetation type on Exhibit 4.3-1. Areas within the Jeffrey pine forest that are more open and where herbaceous cover is dominated by Wright's matting buckwheat are suitable habitat for the federally-listed Threatened ash-gray Indian paintbrush, CNPS 1B listed Parish's rock-cress (*Arabis parishii*), and California Native Plant Society (CNPS 1B) listed silver-haired ivesia. Of the 54.92 acres of Jeffrey Pine forest, 18.01 acres are considered open Jeffrey Pine forest habitat.



Source: Source: Hicks & Hartwick, Inc. (July, 2009), Tim Krantz (2008), Scott White & MBA.

NORTH

350 175 0 350

Feet

Michael Brandman Associates

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Exhibit 4.3-1
Plant Communities Map

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Pebble Plain

Pebble plain occurs on 0.69 acre of the project site north of State Route 38 (SR-38). It appears as a distinct open patch within open Jeffrey pine forest in the western portion of the project site. The substrate in this area consists of clay soil mixed with quartzite pebbles and gravel that are continually pushed to the surface through frost action. This substrate supports a high floristic diversity consisting of small cushion-forming plants, tiny annuals, grasses, and succulents that are well spaced, low growing, and sun tolerant. Several rare and special status plants are associated with pebble plain habitat, including federally-listed Threatened and Endangered species. The pebble plain habitat on the project site has been subjected to disturbance by unauthorized off-road vehicles.

Pebble Plains and Drought

Drought related conditions, which occurred during the first half of this decade resulted in pebble plain species being more difficult to locate and identify due to dormancy factors attributed from conditions of prolonged drought. Therefore, surveys that were conducted during this time (2000-2007) attempted a more focused approach in order to identify all suspected areas probable for containing threatened pebble plain species. This practice, through trial and error, may have resulted in an over-calculated estimate as was apparent in the 2008 Krantz survey (non-drought year), which identified a far less quantity of ash-gray Indian paintbrush species within the project site's pebble plain and Jeffrey pine habitats.

Lakeshore Species

Approximately 4.0 acres of the southern boundary of the project site is formed by the shore of Big Bear Lake. Plant species along the shore itself consist primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Several seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*) also occur in this plant community. Small patches of ruderal species transitioning into upland grassland occur along the lakeshore south of SR-38. The lake was well below its maximum level in 2001 to 2002 due to acute drought conditions. Vegetation in the narrow strip is patchy and occurs above the high-water level in areas where small areas of Jeffrey pine forest are interspersed among open ruderal vegetation and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*).

Developed

Developed areas (abutting SR-38) occur on 2.82 acres along the shoreline of the project site. Plants found in this vegetation type consist of native and non-native ornamental species which offer very little habitat value for native wildlife species. Paved areas such as SR-38 and existing turnouts are included in this vegetation type.

Wildlife

The project site has the potential to support a large variety of wildlife species.

Amphibians

Amphibians require moisture for at least a portion of their life cycle and many require standing or flowing water for reproduction. Although more typical in mesic conditions, there are a number of amphibians species that occur or potentially occur even in the more xeric habitats. These species are able to survive in dry areas by remaining beneath the soil in burrows, under logs or leaf litter, and emerging only when temperatures are low and humidity is high. Many of these species' habitats are associated with water, and they emerge to breed once the rainy season begins. Soil moisture conditions can remain high throughout the year within some habitat types, depending on factors such as amount of vegetation cover, elevation, and slope aspect.

No amphibians were detected during the field surveys; however, leaf litter and rotting logs on the project site provide potential habitat for the Pacific slender salamander (*Batrachoseps pacificus*). The western toad (*Bufo boreas*) would also be expected to occur on the project site.

Reptiles

Reptilian diversity and abundance typically vary with vegetation type and character. Many species prefer only one or two vegetation types; however, most will forage in a variety of habitats. Most species occurring in open areas use rodent burrows for cover and protection from predators and extreme weather conditions. Those species discussed below that were not observed during surveys are expected to occur based on the presence of suitable habitat (substrate and vegetation) within the project site.

Reptile species observed during the surveys include the western fence lizard (*Scleroporus occidentalis*), sagebrush lizard (*Sceloperus graciosus*), western skink (*Eumeces skiltonianus*), southern alligator lizard (*Elgaria multicarinatus*), and southern Pacific rattlesnake (*Crotalus viridis helleri*). Common reptile species expected to occur on the project site include the side-blotched lizard (*Uta stansburiana*) and gopher snake (*Pituophis melanoleucus*).

Birds

Montane conifer forests in the San Bernardino Mountains can experience severe weather conditions during the winter months. Nonetheless, several resident bird species are expected to occur on the project site, using the habitats throughout the year. Other species are present only during certain seasons.

Common resident bird species observed on the project site during surveys include the following:

- Band-tailed pigeon (*Columba fasciata*);
- Great-horned owl (*Bubo virginianus*);
- Red-breasted nuthatch (*Sitta canadensis*);
- White-breasted nuthatch (*Sitta carolinensis*);

- Acorn woodpecker (*Melanerpes formicivorus*);
- Red-breasted sapsucker (*Sphyrapicus ruber*);
- Hairy woodpecker (*Picoides villosus*);
- Nuttall's woodpecker (*Picoides nuttallii*);
- Northern flicker (*Colaptes auratus*);
- Black phoebe (*Sayornis nigricans*);
- Stellar's jay (*Cyanocitta stelleri*);
- Common raven (*Corvus corax*);
- Mountain chickadee (*Poecile gambeli*);
- Bushtit (*Psaltriparus minimus*);
- House wren (*Troglodytes aedon*);
- Western bluebird (*Sialia mexicana*);
- Northern mockingbird (*Mimus polyglottos*);
- European starling (*Sturnus vulgaris*);
- Spotted towhee (*Pipilo maculatus*);
- Dark-eyed junco (*Junco hyemalis*);
- Brewer's blackbird (*Euphagus cyanocephalus*);
- Brown-headed cowbird (*Molothrus ater*);
- House finch (*Carpodacus mexicanus*);
- Red crossbill (*Loxia curvirostra*); and
- Wild turkey (*Meleagris gallopavo*).

Mammals

The ornate shrew (*Sorex ornatus*), brush mouse (*Peromyscus boylii*), western grey squirrel (*Sciurus griseus*), California ground squirrel (*Spermophilus beecheyi*), dusky-footed woodrat (*Neotoma fuscipes*), California vole (*Microtus californicus*), and coyote (*Canis latrans*) were observed on the project site during the surveys. Larger mammals that may occur on the project site include the gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), badger (*Taxidea taxus*), and mountain lion (*Felis concolor*). The California myotis (*Myotis californicus*) and big brown bat (*Eptesicus fuscus*) may occur on the project site. Gaps in peeling bark and hollow snags or limbs provide potential roosting and maternal colony opportunities for these and other bat species. Other mammals expected to occur on the project site include the following:

- Dusky shrew (*Sorex monticolus*);
- Broad-footed mole (*Scapanus latimanus*);
- Merriam's chipmunk (*Tamias merriami*);
- Lodgepole chipmunk (*Tamias speciosus*);
- Golden-mantled ground squirrel (*Spermophilus lateralis*);
- Deer mouse (*Peromyscus maniculatus*);
- Western harvest mouse (*Reithrodontomys megalotis*);
- Botta's pocket gopher (*Thomomys bottae*); and
- House mouse (*Mus musculus*).

Special Status Biological Resources

The following discussion addresses special status biological resources observed, reported, or having the potential to occur on the project site. These resources include plant and wildlife species that have been afforded special status and/or recognition by federal and state resource agencies, as well as the CNPS. Table 4.3-2, Special Status Plant Species, and Table 4.3-3, Special Status Wildlife Species, provide a summary of special status plant and wildlife species known to occur in the Proposed Alternative Project region including information on the status, potential for occurrence, and definitions for the various status designations.

Table 4.3-2: Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Abronia nana ssp. *covillei* Coville's dwarf abronia	None	None	4	None; restricted to carbonates soils
Allium parishii Parish's onion	None	None	4	Low; above known elevation range
Antennaria marginata White-margined everlasting	None	None	2	None; outside of known geographic range (only local occurrences in Barton Flats area)
Arabis breweri var. *pecuniaria* San Bernardino rock-cress	None	None	1B	None; outside geographical range
Arabis dispar Pinyon rock-cress	None	None	2	None; outside known geographic range (only occurs on desert-facing slopes)
Arabis parishii Parish's rock-cress	None	None	1B	Observed
Arabis shockleyi Shockley's rock-cress	None	None	2	None; restricted to carbonates soils
Arenaria lanuginosa ssp. *saxosa* Rock sandwort	None	None	2	Moderate; marginally suitable habitat
Arenaria ursina Big Bear Valley sandwort	FT	C	1B	High; suitable habitat
Astragalus albens Cushenbury milk-vetch	FE	C	1B	None; no suitable habitat (carbonate soils)
Astragalus bicristatus Crested milk-vetch	None	None	4	High; suitable habitat
Astragalus lentiginosus var. *sierrae* Big Bear Valley milk-vetch	None	None	1B	High; suitable habitat
Astragalus leucolobus Big Bear Valley woollypod	None	None	1B	Observed
Atriplex parishii Parish's smallscale	None	None	1B	None; no suitable habitat (alkali sink)
Berberis fremontii Fremont's barberry	None	None	3	None; no suitable habitat (presumed extinct in Cushenbury area)
Botrychium crenulatum Scalloped moonwort	None	None	2	None; no suitable habitat (marshes, bogs)
Calochortus palmeri var. *palmeri* Palmer's mariposa lily	None	None	1B	Moderate; marginally suitable habitat
Calochortus plummerae Plummer's mariposa lily	None	None	1B	None; above known elevation range
Castilleja cinerea Ash-gray Indian paintbrush	FT	None	1B	Observed
Castilleja lasiorhyncha San Bernardino Mountain owl's clover	None	None	1B	High; suitable habitat

Table 4.3 2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Dryopteris filix-mas Male fern	None	None	2	Low; local rarity; outside known range
Dudleya abramsii ssp. *affinis* San Bernardino Mountains dudleya	None	None	1B	Moderate; marginally suitable habitat
Erigeron breweri var. *jacinteus* San Jacinto Mountains daisy	None	None	4	None; below known elevation range
Erigeron parishii Parish's daisy	FT	None	1B	None; no suitable habitat (carbonate soils)
Erigeron unicaulis Limestone daisy	None	None	2	None; outside known geographic range (local reports erroneous)
Eriogonum foliosum Leafy buckwheat	None	None	1B	High; suitable habitat
Eriogonum kennedyi var. *austromontanum* Southern mountain buckwheat	FT	None	1B	Low; suitable habitat (see text)
Eriogonum ovalifolium var. *vineum* Cushenbury buckwheat	FE	None	1B	None; no suitable habitat (carbonate soils)
Eriophyllum lanatum var. *obovatum* Southern Sierra wooly sunflower	None	None	4	Low; margin of known geographic range
Fimbristylis thermalis Hot springs fimbristylis	None	None	4	None; no suitable habitat (alkaline meadows, hot springs)
Galium jepsonii Jepson's bedstraw	None	None	4	High; suitable habitat
Galium johnsttonii Johnston's bedstraw	None	None	4	High; suitable habitat
Gentiana fremontii Moss gentian	None	None	2	None; no suitable habitat
Gilia leptantha ssp. *leptantha* San Bernardino Mountains gilia	None	None	1B	Low (see text)
Helianthus nuttalli ssp. *parishii* Los Angeles sunflower	None	None	1A	None; presumed extinct, above known elevation range
Heuchura hirsutissima Shaggy-haired alum root	None	None	1B	Low; limited suitable habitat
Heuchura parishii Parish's alumroot	None	None	1B	Low; limited suitable habitat
Horkelia wilderae Barton Flats horkelia	None	None	1B	None; outside known geographic range, endemic to Barton Flats area
Hulsea vestita ssp. *parryi* Parry's sunflower	None	None	4	None; outside known geographic range (only occurs on desert-facing slopes)
Hulsea vestita ssp. *pygmaea* Pygmy hulsea	None	None	1B	None; below elevation range

Table 4.3 2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Ivesia argyrocoma Silver-haired ivesia	None	None	1B	Observed
Juncus duranii Duran's rush	None	None	4	High; suitable habitat
Lesquerella kingii var. *bernardina* San Bernardino Mountains bladderpod	FE	None	1B	None; no suitable habitat (carbonate soils)
Lewisia brachycalyx Short-sepaled lewisia	None	None	2	Moderate; limited suitable habitat
Lilium humbodtii ssp. *ocellatum* Ocellated Humboldt lily	None	None	4	None; above known elevation range
Lillium parryi Lemon lily	None	None	1B	None; no suitable habitat
Linanthus killipii Baldwin Lake linanthus	None	None	1B	High; suitable habitat
Malaxiis monohyllos ssp. *brachypoda* Adder's mouth	None	None	2	None; below known elevation range
Mimulus exiguus San Bernardino Mountain monkeyflower	None	None	1B	High; suitable habitat
Mimulus purpureus var. *purpureus* Purple monkeyflower	None	None	2	Observed
Monardella macrantha ssp. *hallii* Hall's monardella	None	None	1B	None; outside known geographic range
Navarretia peninsularis Baja navarretia	None	None	1B	Low; limited suitable habitat
Oxytheca caryophylloides Chickweed oxytheca	None	None	4	High; suitable habitat
Oxytheca parishii var. *cienegensis* Cienega seca oxytheca	None	None	1B	None; outside known geographic range
Oxytheca parishii var. *goodmaniana* Cushenbury oxytheca	FE	None	1B	None; no suitable habitat (carbonate soils)
Oxytropis oreophila Mountain oxytrope	None	None	2	None; below known elevation range
Perideridia parishii ssp. *parishii* Parish's yampah	None	None	2	Low; limited suitable habitat
Phacelia exilis Transverse Range phacelia	None	None	4	High; suitable habitat
Phacelia mohavensis Mojave phacelia	None	None	4	High; suitable habitat
Phlox dolichantha Bear Valley phlox	None	None	1B	Observed

Table 4.3 2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Poa atropurpurea San Bernardino bluegrass	FE	None	1B	Low; limited suitable habitat
Poliomintha incana Frosted mint	None	None	1A	None; no suitable habitat (dunes and sandy flats), above known elevation range
Polystichum kruckebergii Krukeberg's sword fern	None	None	4	None; limited suitable habitat, outside known geographic distribution
Populus angustifolia Narrow-leaved cottonwood	None	None	2	None; outside known geographic range
Pyrrocoma uniflora ssp. *gossypina* Bear Valley pyrrocoma	None	None	1B	Moderate; suitable habitat
Rupertia rigida Parish's rupertia	None	None	4	High; limited suitable habitat
Scutellaria bolanderi ssp. *austromntanum* Southern mountain skullcap	None	None	1B	None, outside known geographic range, above known elevation range
Sedum niveum Davidson's stonecrop	None	None	4	None; no suitable habitat (rock ledges and cliffs)
Selaginella asprella Bluish spike-moss	None	None	4	Low; limited suitable habitat
Senecio bernardinus San Bernardino butterweed	None	None	1B	Low; limited suitable habitat
Senecio ionophyllus Tehachapi ragwort	None	None	4	Low; limited suitable habitat
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	C	R	1B	Low; limited suitable habitat
Sidalcea pedata Bird's foot checkerbloom	FE	SE	1B	Low to moderate (see text); suitable habitat
Sphenopholis obtusata Prairie wedge grass	None	None	2	High; suitable habitat
Streptanthus bernardinus Laguna Mountains jewelflower	None	None	4	High; suitable habitat
Streptanthus campestris Southern jewelflower	None	None	1B	High; suitable habitat
Swertia neglecta Pine green-gentian	None	None	4	High; suitable habitat
Taraxacum californicum California dandelion	FE	None	1B	Low; limited suitable habitat
Thelypodium stenopetalum Slender-petaled thelypodium	FE	None	1B	None; no suitable habitat (alkaline meadows)
Trichostema micranthum Small-flowered bluecurls	None	None	4	High; suitable habitat
Viola pinetorum ssp. *grisea* Grey-leaved violet	None	None	1B	Low; outside known geographic range

Table 4.3 2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Status Definitions: **USFWS** FE: Species designated as endangered under the federal Endangered Species Act. Endangered = "any species in danger of extinction throughout all or a significant portion of its range." FT: Species designated as threatened under the Federal Endangered Species Act. Threatened = "species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." FPE: Proposed for federal listing as Endangered. FPT: Proposed for federal listing as Threatened. C: Candidate for federal listing as Threatened or Endangered. SOC: Species of Concern **CDFG** ST: Threatened = "a species that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this Act" (California Endangered Species Act). SE: Endangered = "a species is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes." R: Rare C: Candidate for state listing as Threatened or Endangered. **CNPS** 1A Plants Presumed Extinct in California 1B Plants Rare, Threatened, or Endangered in California and Elsewhere Plants Rare, Threatened, or Endangered in California But More Common Elsewhere Plants About Which We Need More Information- A Review List Plants of Limited Distribution - A Watch List				

Special Status Plants

Eighty-one (81) special status plant species are known to occur in the project region, 30 of which occur or have a moderate or higher potential to occur on the project site. A brief description of these special status plant species are outlined below and summarized above in Table 4.3-2. Six of these special status plant species have been observed on the project site.

Parish's Rock-Cress (*Arabis parishii*). Parish's rock cress is a CNPS List 1B species that typically blooms from April to May. This perennial herb occurs in rocky, quartzite and clay, or sometimes carbonate soils in pebble plains, pinyon-juniper woodlands, and upper montane coniferous forests from approximately 3,900 to 8,000 feet above msl. It is endemic to the San Bernardino Mountains. A 2002 survey of the project site found the species was observed uncommonly in scattered patches throughout pebble plain and open Jeffrey pine forest on the project site during botanical surveys conducted in 2002 (White and Leatherman, 2002). A 2007 survey conducted by Scott White Biological Consultin, and a 2008 survey conducted by Timothy Krantz Biological Consulting reaffirmed that no changes in the species location or size have occurred.

Big Bear Valley Woollypod *(Astragalus leucolobus)*. Big Bear Valley woollypod is a CNPS List 1B species that typically blooms from May to July. This perennial herb occurs in rocky soils of lower montane coniferous forest, pebble plain, pinyon-juniper woodland, and upper montane coniferous forests from approximately 5,600 to 8,000 feet above msl. It is found in the

San Bernardino, San Gabriel, San Jacinto, and Santa Rosa mountains. This species was observed throughout the project site during botanical surveys conducted in 2002 (White and Leatherman, 2002). The 2007 White survey and 2008 Krantz reaffirmed that no changes in the species location or size have occurred.

Palmer's Mariposa Lily *(Calochortus palmeri var. palmeri)*. Palmer's mariposa lily is a CNPS List 1B species that typically blooms between May and July. This perennial, bulbiferous herb occurs in mesic chaparral, lower montane coniferous forest, meadows, and seeps from approximately 3,200 to 7,200 feet above msl. It is a California endemic found in the South Coast and Transverse ranges in Kern, Los Angeles, Riverside, Santa Barbara, San Bernardino, San Luis Obispo, and Ventura counties. This species has a moderate potential to occur on-site.

Ash-Gray Indian Paintbrush (*Castilleja cinerea*). Ash-gray Indian paintbrush is a federally-listed Threatened and CNPS List 1B species. It is a root parasite on other plants, often parasitizing the Federally-listed Threatened southern mountain buckwheat and Wright's matting buckwheat. It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows, seeps, and open pinyon or Jeffrey pine forest from approximately 5,900 to 9,300 feet above msl and is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). This species was reported and mapped on the project site by MBA (MBA 2000) and the CNDDB (CDFG 2001). Botanical surveys in 2002 identified populations of this species throughout approximately 11.8 acres of pebble plain habitat and open Jeffrey pine forest in the western half of the project site. The survey also indicated that the species was parasitizing Wright's matting buckwheat. The 2007 White survey indicated that the species location and size had not change from previous surveys conducted by MBA (2000) and by White (2007). However, a survey performed in 2008 by Dr. Timothy Krantz (a year with normal precipitation) indicated that the species occurrence in the middle and western portions of the project site was significantly less in size than previously reported in surveys conducted by CNDDB, MBA and White. A total of 7.71 acres of occupied habitat occurs on the project site.

San Bernardino Mountains Dudleya *(Dudleya abramsii ssp. affinis)*. The San Bernardino Mountains dudleya is a CNPS List 1B species that typically blooms from April to June. This perennial herb occurs in granitic, quartzite, or carbonate soils of pebble plain, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,800 to 8,500 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be moderate.

Leafy Buckwheat (*Eriogonum foliosum*). Leafy buckwheat is a CNPS List 1B species that typically blooms from July to October. This annual herb occurs in sandy soils of chaparral, lower montane coniferous forest, and pinyon-juniper woodland from approximately 3,900 to 7,200 feet above msl. This species is found in scattered locations from Big Bear Valley south to Baja California. The

project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Jepson's Bedstraw (*Galium jepsonii*). Jepson's bedstraw is a CNPS List 4 species that typically blooms from July to August. This rhizomatous, perennial herb occurs in granitic, rocky or gravelly soils in lower and upper montane coniferous forests from approximately 6,500 to 8,100 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Johnston's Bedstraw (*Galium johnstonii*). Johnston's bedstraw is a CNPS List 4 species that typically blooms from June to July. This perennial herb occurs in chaparral, lower montane coniferous forest, pinyon-juniper woodland, and riparian woodland from approximately 5,300 to 7,500 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Silver-Haired Ivesia (*Ivesia argyrocoma*). Silver-haired ivesia is a CNPS List 1B species that typically blooms between June and August. This perennial herb occurs in alkaline meadows and seeps, pebble plains, and upper montane coniferous forest from approximately 4,900 to 8,800 feet above msl. It occurs in the San Bernardino Mountains and a disjunct population occurs in the mountains of Baja California. This species was reported on the project site by MBA (MBA 2000) and was observed throughout mapped pebble plain habitat on the project site during the 2002 and 2008 botanical surveys.

Duran's Rush (*Juncus duranii)*. Duran's rush is a CNPS List 4 species that typically blooms from July to August. It is a rhizomatous, perennial herb that occurs in mexic soils of lower montane coniferous forest, meadows and seeps, and upper montane coniferous forest from approximately 5,800 feet to 9,000 feet above msl. This species is found in the San Bernardino, San Gabriel, and San Jacinto mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Short-Sepaled Lewisia (*Lewisia brachycalyx*). Short-sepaled lewisia is a CNPS List 2 species that typically blooms from May to June. It is a perennial herb that occurs in mesic meadows and seeps, and lower montane coniferous forest from 4,500 to 7,500 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be moderate.

Baldwin Lake Linanthus (*Linanthus killipii*). The Baldwin Lake linanthus is a CNPS List 1B species that blooms from May to July. It is an annual herb that occurs in alkaline meadows and seeps, pebble plain, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,500 to 7,800 feet above msl. This species is endemic to the San Bernardino Mountains. The

project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

San Bernardino Mountain Monkeyflower (*Mimulus exiguus*). The San Bernardino Mountain monkeyflower is a CNPS List 1B species that typically blooms from June to July. It is an annual herb that occurs in mesic, clay soils of meadows and seeps, pebble plain, and upper montane coniferous forest between approximately 5,800 and 7,500 feet above msl. This species is found in the San Bernardino Mountains and high mountains of Baja California. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Purple Monkeyflower (*Mimulus purpureus var. purpureus*). Purple monkeyflower is a CNPS List 2 species that typically blooms from May to July. It is an annual herb that occurs in meadows and seeps, pebble plain, and upper montane coniferous forest from approximately 6,100 to 7,500 feet above msl. This species is found in the San Bernardino Mountains and high mountains of Baja California. The species was first observed on site during botanical surveys in 1988 and was later found to be widely distributed among the site's pebble plain, the 4.91-acre conservation easement area, and along a draw on the eastern portion of the site, corresponding to Lot 50 (Krantz, 2008).

Chickweed Oxytheca *(Oxytheca caryophylloides).* Chickweed oxytheca is a CNPS List 4 species that typically blooms from July to September. It is an annual herb that occurs in sandy soils of lower montane coniferous forest from approximately 3,900 to 8,500 feet above msl. This species is found in the southern Sierra Nevada, Transverse Ranges, and San Jacinto Mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Parish's Yampah (*Perideridia parishii ssp. parishii*). Parish's yampah is a CNPS List 2 species that typically blooms from June to August. It is a perennial herb that occurs in lower and upper montane coniferous forests, and meadows and seeps above approximately 6,500 feet above msl. This species is found in the San Bernardino Mountains and in disjunct populations in Arizona and New Mexico. There is a low potential for this species to occur on site.

Transverse Range Phacelia (*Phacelia exilis*). The Transverse Range phacelia is a CNPS List 4 species that typically blooms from May to August. It is an annual herb that occurs in sandy or gravelly soils in lower and upper montane coniferous forests, and meadows and seeps from approximately 3,500 to 8,500 feet above msl. This species is found in the southern Sierra Nevada and Transverse Ranges. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Mojave Phacelia (*Phacelia mohavensis*). The Mojave phacelia is a CNPS List 4 species that typically blooms from April to August. It is an annual herb that occurs in sandy or gravelly soils of cismontane woodland, lower montane coniferous forest, meadows and seeps, and pinyon-juniper woodland from approximately 4,500 to 8,100 feet above msl. This species is found in the

San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Bear Valley Phlox (*Phlox dolichantha*). The Bear Valley phlox is a CNPS List 1B species that blooms from June to July. It is a perennial herb that occurs in pebble plain and upper montane coniferous forest from approximately 6,500 to 8,800 feet above msl. This species is endemic to the San Bernardino Mountains. Although restricted to Big Bear and Holcomb Valleys, its regional distribution extends up to the summit of Sugarloag Mountain south of Big Bear Valley and as far north as White Mountain, northwest of Holcomb Valley. The taxon is fairly common within its range and is not considered to be a high priority for formal listing or more formal protection (Krantz 2008). Krantz (2008) found the species to be rather widely distributed on the project site in open black oak woodland and under Jeffrey pines.

San Bernardino Bluegrass (*Poa atropurpurea*). San Bernardino bluegrass is a Federally-listed Endangered and CNPS List 1B species that typically blooms from May to June. It is a rhizomatous, perennial herb that occurs in mesic meadows and seeps between approximately 4,800 and 7,200 feet above msl. This species is found in the San Bernardino and Laguna mountains (San Diego). The project site does not provide suitable habitat for this species and the potential to occur is considered to be low.

Bear Valley Pyrrocoma (*Pyrrocoma uniflora ssp. gosssypina*). Bear Valley pyrrocoma is a CNPS List 1B species that typically blooms from July to August. It is a perennial herb that occurs in meadows and seeps, and pebble plain from approximately 5,200 to 7,600 feet above msl. This species is endemic to the San Bernardino Mountains. The project site does not provide suitable habitat for this species and the potential to occur is considered to be low.

Parish's Rupertia (*Rupertia rigida*). Parish's rupertia is a CNPS List 4 species that typically blooms from June to July. It is a perennial herb that occurs in chaparral, cismontane woodland, and lower montane coniferous forest below approximately 8,100 feet above msl. This species is found in the San Bernardino Mountains, Peninsular Ranges, and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Prairie Wedge Grass (*Sphenopholis obtusata)*. Prairie wedge grass is a CNPS List 2 species that typically blooms from April to July. It is a perennial herb that occurs in mesic soils of cismontane woodland, meadows and seeps between approximately 1,000 and 6,550 feet above msl. This species is found in a few widely scattered locations in Amador, Fresno, Inyo, Mono, Riverside, and San Bernardino counties in California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Laguna Mountains Jewelflower (*Streptanthus bernardinus*). The Laguna Mountains jewelflower is a CNPS List 4 species that typically blooms from June to July. It is a perennial herb that occurs in

chaparral, and lower montane coniferous forest between approximately 3,900 and 8,100 feet above msl. This species is found in the Transverse and Peninsular ranges and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Southern Jewelflower *(Streptanthus campestris*). The southern jewelflower is CNPS List 1B species that typically blooms from May to July. It is a perennial herb that occurs in rocky soils of chaparral, lower montane coniferous forest, and pinyon-juniper woodland from approximately 2,900 to 7,500 feet above msl. This species is known from fewer than twenty occurrences in Riverside, San Bernardino, and San Diego counties, and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Pine Green-Gentian (*Swertia neglecta)*. Pine green-gentian is a CNPS List 4 species that typically blooms from May to July. It is a perennial herb that occurs in lower and upper montane coniferous forests, and pinyon-juniper woodlands from approximately 4,500 to 8,100 feet above msl. This species is found in the South Coastal and Transverse ranges within Los Angeles, San Bernardino, and Ventura counties. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Small-Flowered Bluecurls (*Trichostema micranthum*). Small-flowered bluecurls is a CNPS List 4 species that typically blooms from July to September. It is an annual herb that occurs in mesic soils in lower montane coniferous forest and meadows and seeps from 6,500 to 7,500 feet above msl. This species is found in the San Bernardino Mountains and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Table 4.3-3: Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Invertebrates			
Euchloe hyantis ssp. *andrewsi* Andrews' marble butterfly	SOC	C	Low; above known elevation range, limited suitable habitat
Amphibians			
Ensatina escholtzii croceater Yellow-blotched salamander	SOC	SSC	Low; limited marginally suitable habitat
Ensatina escholtzii klauberi Large-blotched salamander	SOC	SSC	None; above known elevation range, outside known geographic range
Rana muscosa Mountain yellow-legged frog	FPE	SSC	None; no suitable habitat
Scaphiopus hamondii Western spadefoot toad	SOC	SSC	None; above known elevation range
Taricha torosa torosa Coast range newt	SOC	SSC	None; no suitable habitat, above known elevation range
Reptiles			
Anniella pulchra pulchra Silvery legless lizard	SOC	SSC	Low; above known elevation range

Table 4.3-3 (cont.): Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Charina bottae umbricata Southern rubber boa	SOC	ST	Low; limited suitable habitat
Cnemidophorus tigris multiscutatus Coastal western whiptail	SOC	C	Moderate; suitable habitat
Coleonyx variegatus abbotti San Diego banded gecko	SOC	C	None; above known elevation range, no suitable habitat
Diadophis punctatus modestus San Bernardino ringneck snake	SOC	C	Low; limited suitable habitat
Lampropeltis zonata parvirubra San Bernardino Mountain kingsnake	SOC	C	Moderate; marginally suitable habitat
Lichanura trivirgata roseofusca Coastal rosy boa	SOC	C	None; above known elevation range
Phrynosoma coronatum ssp. *blainvillei* San Diego coast horned lizard	SOC	SSC/P	None; above known elevation, lack of suitable habitat
Sceloporus graciosus vendenbergianus Southern sagebrush lizard	SOC	C	Observed
Salvadora hexalepis virgultea Coast patch-nosed snake	SOC	SSC	None; lack of suitable habitat, above known elevation
Thamnophis hammondii hammondii Two-striped garter snake	C	SSC	None; no suitable habitat
Birds			
Accipiter cooperii Cooper's hawk	C	SSC	Nesting: Moderate Foraging: High
Accipiter gentilis Northern goshawk	SOC	SSC	Nesting: None Foraging: Moderate
Accipiter striatus Sharp-shinned hawk	C	SSC	Nesting: None Foraging: High in winter
Aimophila ruficeps canescens Southern California rufous-crowned sparrow	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Amphispiza belli belli Bell's sage sparrow	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Aquila chrysaetos Golden eagle	C	SSC	Nesting: None Foraging: High
Asio otus Long-eared owl	C	SSC	Nesting: Low Foraging: Moderate
Buteo regalis Ferruginous hawk	SOC	SSC	Nesting: None Foraging: Low in winter
Circus cyaneus Northern harrier	C	SSC	Nesting: None Foraging: Low
Cypseloides niger Black swift	C	SSC	Nesting: None Foraging: Moderate
Dendroica petechia Yellow warbler	C	SSC	Nesting: None Foraging: Moderate
Elanus leucereus White-tailed kite	C	FP	Nesting: Low Foraging: Low

Table 4.3-3 (cont.): Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Empidonax traillii extimus Southwestern willow flycatcher	FE	SE	Nesting: Low Foraging: Moderate; rare migrant
Eremophila alpestris actia California horned lark	C	SSC	Nesting: None Foraging: None; above known elevation range
Falco columbaris Merlin	C	SSC	Nesting: None Foraging: Low
Falco mexicanus Prairie falcon	C	SSC	Nesting: None Foraging: Low
Falco peregrinus anatum American Peregrine falcon	C	FE	Nesting: None Foraging : Low
Haliaeetus leucocephalus Bald eagle		SE	Observed Observed
Lanius ludovicianus Loggerhead shrike	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Piranga flava Hepatic tanager	C	SSC	Nesting: Low Foraging: Low
Progne subis Purple martin	C	SSC	Nesting: Low Foraging: Low; local rarity
Strix occidentalis occidentalis California spotted owl	SOC	SSC	Nesting: Low/None observed during focused surveys Foraging: High/Observed in close proximity to project site
Vireo vicinior Gray vireo	C	SSC	Nesting: None Foraging: Low
Mammals			
Antrozus pallidus Pallid bat	C	SSC	Roosting: Low Foraging: Low
Euderma maculatum Spotted bat	SOC	SSC	Roosting: None Foraging: Moderate
Eumops perotis californicus California mastiff bat	SOC	SSC	Roosting: None Foraging: Low
Glaucomys sabrinus californicus San Bernardino Mountain flying squirrel	SOC	SSC	Breeding: Low Foraging: High
Myotis ciliolabrum Small-footed myotis	SOC	C	Roosting: Low Foraging: High
Myotis evotis Long-eared myotis	SOC	C	Roosting: High Foraging: High
Myotis lucifugus Occult little brown bat	SOC	SSC	Roosting: High Foraging: High
Myotis thysanodes Fringed myotis	SOC	C	Roosting: Low Foraging: Moderate
Myotis volans Long-legged myotis	SOC	C	Roosting: Moderate Foraging: Moderate
Myotis yumanensis Yuma myotis	SOC	C	Roosting: Low Foraging: Moderate

Table 4.3-3 (cont.): Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Onychomys torridus ramona Southern grasshopper mouse	SOC	SSC	None; no suitable habitat
Perognathus alticola alticola White-eared pocket mouse	SOC	SSC	None; presumed extinct locally
Plecotus townsendii townsendii Pacific western big-eared bat	SOC	SSC	Roosting: None Foraging: Moderate

Status Definitions:

USFWS

FE: Species designated as Endangered under the Federal Endangered Species Act. Endangered = "any species in danger of extinction throughout all or a significant portion of its range."

FT: Species designated as Threatened under the Federal Endangered Species Act. Threatened = "species likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range."

FPE: Proposed for federal listing as Endangered.

FPT: Proposed for federal listing as Threatened.

C: Candidate for federal listing as Threatened or Endangered.

SOC: Species of Concern

CDFG

SR: Rare = "a species is rare when, although not presently Threatened with extinction, it is in such small numbers throughout its range that it may become Endangered if its present environment worsens."

ST: Threatened = "a species that, although not presently Threatened with extinction, is likely to become an Endangered species in the foreseeable future in the absence of the special protection and management efforts required by this Act (California Endangered Species Act)."

SE: Endangered = "a species is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes."

SSC: Species of Special Concern.

FP: Fully Protected species are protected by special legislation and cannot be taken at any time.

P: Protected species are also protected by special legislation and can only be taken with a permit issued by the CDFG.

C: Candidate for state listing as Threatened or Endangered.

Special Status Wildlife

Fifty-three (53) special status wildlife species are known to occur within the region, 22 of which have a moderate or high potential to occur within the project site. Focused surveys for the bald eagle, California spotted owl, southwestern willow flycatcher, and southern rubber boa were conducted in the winter, spring, summer and fall of 2002. Additional focused surveys were conducted for the southwestern willow flycatcher and San Bernardino Mountains flying squirrel during spring and summer 2007. A brief description of the special status wildlife species that were determined to have a moderate to high potential to occur on the project site, as well as those species for which focused were conducted, is provided below and summarized in Table 4.3-3. As indicated in Table 4.3-3, two special status wildlife species (bald eagle and southern sagebrush lizard) have been observed on the project site.

Reptiles

Southern Rubber Boa (*Charina bottae umbbricata*). The southern rubber boa is a Federal Species of Concern and State-listed Threatened species found in the San Bernardino and San Jacinto

mountains at elevations between 4,900 and 7,900 feet above msl. The majority of the localities for this species are in a 10-mile long strip of the San Bernardino Mountains between Twin Peaks in the west to Green Valley in the east. Known locations for this species occur on the north-facing slopes immediately south of Big Bear Lake. This species usually occurs in moist woodlands and coniferous forests with deep, well developed soils. It is a burrower and also commonly makes use of rock out crops for hibernation. Large downed logs and a well-developed litter layer are considered important for cover and for maintaining soil moisture. Surveys for this species were conducted in the spring and summer of 2002. An additional assessment of the project site was conducted during February 2007 by Dr. Glenn R. Stewart, PhD, Professor Eneritus of Zoology and Environmental Sciences, Cal Pol Pomona, a noted authority on the SRB (see Appendix B of this Revised and Recirculated Draft EIR). No southern rubber boas were encountered during surveys. Given the lack of historical records in the immediate vicinity of the project site, the negative results of two independent focused survey techniques, and the assessment results of Dr. Stewart, the southern rubber boa has a low potential to occur on the project site.

Coastal Western Whiptail (*Cnemidophorus tigris multiscutatus*). The coastal western whiptail is a Federal Species of Concern. It is a moderately large, slender lizard typically found in open scrub, chaparral, and woodland communities in semi-arid areas or where vegetation is sparse, from below sea level to 7,000 feet above msl. This species is restricted to the western coast of North America from Ventura County south through the northern two-thirds of the Baja California peninsula. The project site provides suitable habitat for this species; however, it is at the maximum elevation for this species and its potential to occur is considered to be moderate.

San Bernardino Mountain Kingsnake (*Lampropeltis zonata parvirubra*). The San Bernardino mountain kingsnake is a Federal Species of Concern that occurs in the San Jacinto, San Bernardino, and San Gabriel mountains. This species typically occurs in open stands of ponderosa pine, Jeffrey pine, Coulter pine, and/or black oak at elevations ranging from 4,500 to 6,500 feet above msl. This species occurs at higher elevations, but is less common. Partially shaded rock outcrops appear to be an important microhabitat element for refugia and basking sites. The project site provides marginally suitable habitat for this species and its potential to occur is considered to be moderate.

Southern Sagebrush Lizard (*Sceloporus graciosus vandenbergianus*). The southern sagebrush lizard is a Federal Species of Concern that occurs in open coniferous forests and shrubland above 3,000 feet above msl. Its known range extends from Mount Pinos south to Baja California. This species inhabits mixed conifer forest, black oak woodlands, montane chaparral, and pinyon-juniper woodlands. This species was observed frequently on the project site.

Birds

Cooper's Hawk (*Accipiter cooperii*). The Cooper's hawk is a State Species of Special Concern. Both resident and migratory populations exist in San Bernardino County. Wintering Cooper's hawks are often seen in wooded urban areas and native woodland communities. Preferred nesting habitats

include riparian forests, mountain canyons, and oak woodlands. Cooper's hawks in the region prey on small birds and rodents that live in woodland and, occasionally, scrub and chaparral communities. Breeding residents have been observed in the vicinity of Big Bear Lake. The project site provides suitable foraging habitat, but a limited amount of nesting habitat for this raptor. Therefore, its overall potential to occur is considered to be high, although the potential for nesting is moderate.

Northern Goshawk (*Accipiter gentilis*). The northern goshawk is a Federal Species of Concern and State Species of Special Concern. Rare in southern California, goshawks have been observed during the breeding season only on Mount Abel, Mount Pinos, and in the San Bernardino and San Jacinto mountains. Breeding has not been documented in the San Bernardino Mountains, although goshawks have been observed near Big Bear Lake. Goshawks occur in a variety of coniferous forest communities, including ponderosa and Jeffrey pine, mixed conifer, white fire and lodgepole pine. Large snags and downed logs are believed to be important habitat elements because they increase the abundance of small- to medium sized birds and mammals composing this species prey base. Limited suitable foraging habitat is present on the project site and the potential for this species is considered moderate for foraging, but no potential for nesting.

Sharp-shinned Hawk (*Accipiter striatus*). The sharp-shinned hawk is a State Species of Special Concern. This raptor is a fairly common winter visitor throughout southern California. It prefers woodland communities, but can also be found in virtually any habitat as it passes through the area during migration. The sharp-shinned hawk is a fairly common winter visitor in the Big Bear Lake vicinity, and its potential to occur for foraging is considered to be high. However, the project site provides no nesting habitat for this raptor.

Golden Eagle (*Aquila chryysaetos*). The golden eagle is a State Species of Special Concern. This raptor is uncommon, but widely distributed throughout foothill, lower montane, and desert montane habitats in southern California. Golden eagles nest primarily on cliffs and hunt for rabbits and other small mammals in open habitats such as grasslands, oak savannas, and open shrublands. No nesting habitat is present on the project site; however, the potential for foraging on the project site is considered high.

Long-eared Owl (*Asio otus*). The long-eared owl is a State Species of Special Concern. It breeds and roosts in riparian forests and woodlands or other dense forest habitats. This owl forages at night in open habitats including marshes, grasslands, and agricultural fields. It occurs throughout North America but is an increasingly rare breeder in southern California. The project site provides moderate suitable foraging habitat and limited nesting habitat, for this species.

Black Swift (*Cypseloides niger)*. The black swift is a State Species of Special Concern. It is known to breed in the San Gabriel Mountains, Mill Creek Canyon in the San Bernardino Mountains, and the San Jacinto Mountains. This species occurs in mountain and foothill canyons where it nests in rocky cliffs behind waterfalls. No suitable nesting habitat is present on the project site; however, this

project site could provide suitable foraging habitat and the potential for this species to forage on the project site is considered moderate.

Yellow Warbler (*Dendroica petechia*). The western yellow-warbler is a California Species of Special Concern. This subspecies of yellow warbler that breeds in southern California is the western yellow warbler (*D.p. brewsteri*). This subspecies occurs in coastal areas from northwestern Washington south to western Baja California. In southern California, yellow warblers breed locally in riparian woodlands. The yellow warbler is an abundant migrant and would be expected to occur in spring and fall during migration. No suitable nesting habitat is present on the project site; however, the potential for foraging migrants on the project site is considered moderate.

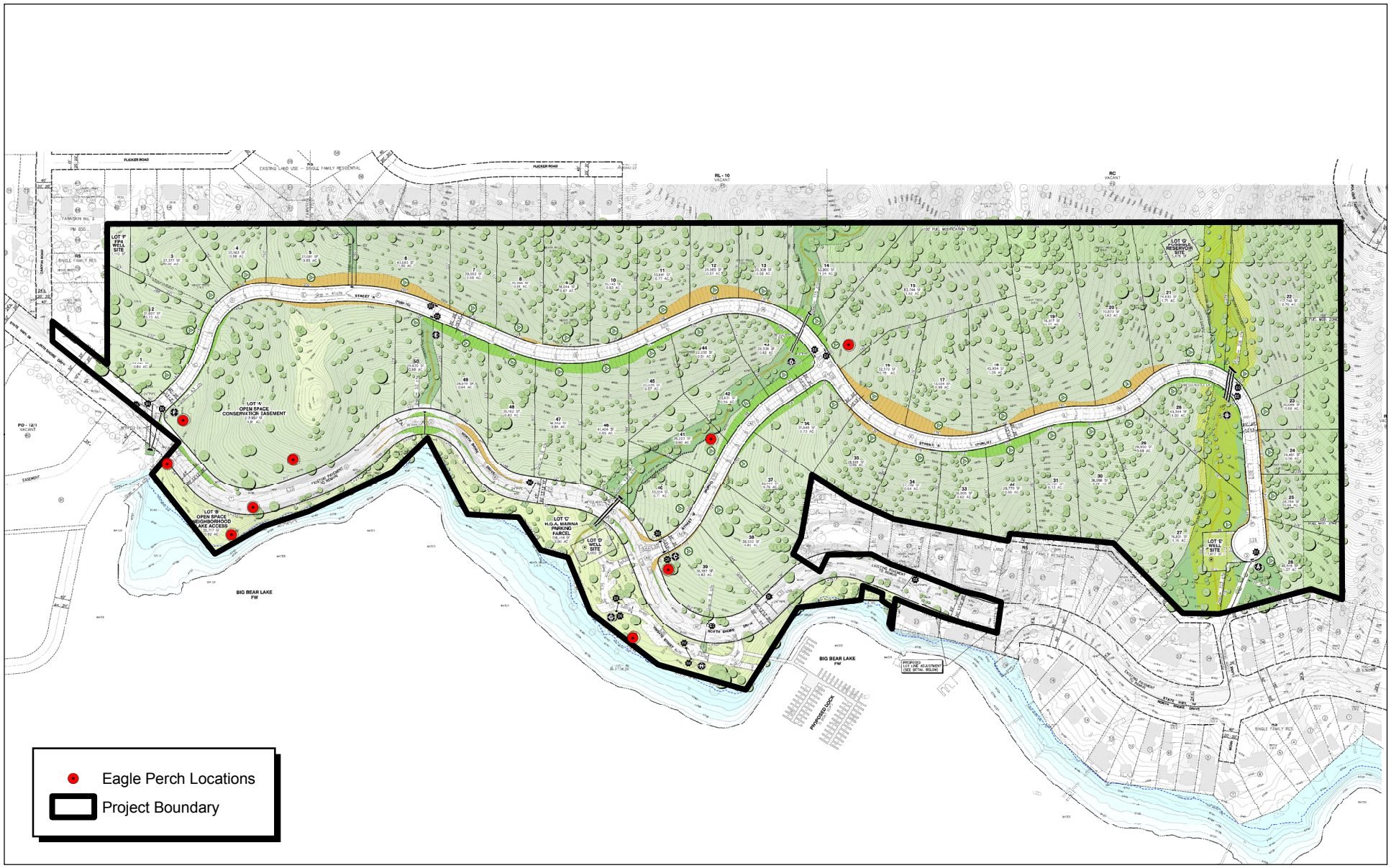
Southwestern Willow Flycatcher (*Empidonax traillii extimus*). The southwestern willow flycatcher is a federally- and State-listed endangered species. This subspecies has declined drastically due to a loss of breeding habitat and nest parasitism by brown-headed cowbirds. This species occurs in riparian habitats along rivers, streams, or other wetlands where dense growths of willows (*Salix* sp.), baccharis (*Baccharis* sp.), arrowweed (*Pluchea* sp.), tamarisk (*Tamarix* sp.), or other plants are present, often with a scattered overstory of cottonwood (*Populus* sp.). The potential for this species to occur on the project site as a foraging migrant is considered to be high, but its potential to nest on the project site is considered low. Surveys for this species were conducted in the spring and summer of 2002 and again in 2007. No breeding or individual southwestern willow flycatchers were detected during the surveys. Willows along the shoreline are patchy and lack the dense growth or willow thicket favored by this species as territorial or breeding habitat. Therefore, breeding southwestern willow flycatchers are not expected to occur on the project site.

Bald Eagle (*Haliaeetus leucocephalus*). The bald eagle is a State-listed endangered species. This raptor typically overwinters in small numbers in southern California near lakes and reservoirs where they feed on fish, coots, and waterfowl. The largest known wintering population in southern California is at Big Bear Lake in the San Bernardino Mountains, where twenty to thirty eagles typically congregate from November to March. This species is known to be present on the project site in winter and could potentially nest on the project site. Surveys and records searches were conducted for the project site in the winter of 2002 and 2007 to determine bald eagle use of perch trees and favored roosting locations (refer to Appendix B of this Revised and Recirculated Draft EIR). The surveys found that the site is used extensively by bald eagles. Bald eagle perch and roost locations were recorded and individual trees were marked with numbered tags. Tree perch locations are shown on Exhibit 4.3-2. The records search confirmed extensive use of the project site by bald eagles and found that the most commonly recorded use of a single tree was also on the project site. In 2007 two bald eagle nests with potentially two pair of bald eagles were located in the Big Bear Lake area (Forest Service, June 25, 2007). One of the nests was located near Grout Bay, which is just west of the project site.

California Spotted Owl (*Strix occidentalis occidentalis*). The California spotted owl is a Federal Species of Concern and State Species of Special Concern. This species occurs in all of the major mountain ranges in southern California, although some ranges support very few pairs. It is found at elevations ranging from below 1,000 feet to 8,500 feet above msl in mature forests typically with a dense, multi-layered canopy. Its prey base consists of woodrats (i.e., *Neotoma* spp.) and other rodents. Surveys were conducted for this species on the project site in the spring and summer of 2002 (refer to Appendix B). Although one male spotted owl was detected approximately one mile to the northwest of the project site, no nesting pairs or individuals were observed on the project site. The San Bernardino National Forest has been conducting focused spotted owl surveys for the past several years and is monitoring the known breeding owls and territories which are located several miles north of the project site in the dense conifer forest. Therefore, no nesting pairs presently occur on the project site; however, individuals have a high potential to forage on the project site

Mammals

Spotted bat (*Euderma maculatum).* The spotted bat is a Federal Species of Concern that occurs throughout much of the western United States, occupying a variety of habitats from arid deserts and grasslands through mixed conifer forests Because of the low frequency of their echolocation calls large open habitat is predicted to be preferred. Spotted bats roost in the small cracks found in cliffs and stony outcrops. They feed almost entirely on moths. The project site does not provide roosting habitat but it does provide potentially suitable foraging habitat for this species.



Source: Hicks & Hartwick, Inc. (July, 2009), Bon Terra Consulting (July, 2003), Tim Krantz (2008), Scott White & MBA.

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Exhibit 4.3-2
Eagle Perch Locations Map

SAN BERNARDINO COUNTY
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San Bernardino Mountain Flying Squirrel (*Glaucomys sabrinus californicus*). The San Bernardino Mountain flying squirrel is a Federal Species of Concern and State Species of Special Concern. It occurs in the San Bernardino Mountains between 5,200 and 8,500 feet above msl. This species prefers mid- to upper-elevation, dense, mature coniferous forest habitats, particularly those containing white fir. They use cavities in large trees, snags, and logs for cover. The project site provides suitable foraging habitat for this species and the potential for occurrence is considered high. The northeastern portion of the project site provides potential nesting habitat as the forest in this area more dense with some portions having a closed canopy. This species was trapped in 1998 by the Forest Service approximately 0.5 mile north of the northern boundary of the project site. A focused survey was conducted on the project site in 2007 and resulted in negative findings.

Small-footed Myotis (*Myotis ciliolabrum*). The small-footed myotis is a Federal Species of Concern that occurs throughout much of the western United States, occupying a variety of habitats. This species feeds among trees or over brush, and roosts in cavities of cliffs, trees, or rocks and within caves or mine shafts. The project site provide potentially suitable roosting and foraging habitat for this species and the potential for occurrence is considered to be low for roosting and high for foraging.

Long-eared Myotis (*Myotis evotis*). The long-eared myotis is a Federal Species of Concern that is restricted to high-elevation habitats. It is known to occur in Coon Creek in the San Bernardino National Forest. This species can occur in a variety of habitats, but are usually associated with coniferous forests where they roost under exfoliating tree bark. The project site provides potentially suitable roosting and foraging habitat for this species and the potential for occurrence is considered to be high for foraging and roosting.

Occult Little Brown Bat (*Myotis lucifugus*). The occult little brown bat is a Federal Species of Concern and State Species of Special Concern that is restricted to high-elevation habitats. This species occurs in pine forests at elevations ranging from 6,000 to 9,000 feet above msl. It roosts in buildings, trees, and cliffs and feeds over water or open sites. The project site provides suitable roosting and foraging habitat and the potential for this species to occur is considered to be high for foraging and roosting.

Fringed Myotis (*Myotis thysanodes*). The fringed myotis is a Federal Species of Concern that is restricted to high-elevation habitats. This species has been observed on Arrastre Creek on the San Bernardino National Forest. It occurs in a wide variety of habitats but is most commonly found in dry pine or mixed conifer forests and pinyon-juniper woodlands where it will roost in caves, buildings, mine shafts, rock crevices in cliff faces, trees, and bridges. Hibernation has only been documented in buildings and mines. The project site provides marginally suitable roosting and foraging habitat for this species and potential for occurrence is considered to be moderate for foraging and low for roosting.

Long-legged Myotis (*Myotis volans*). The long-legged myotis is a Federal Species of Concern that is restricted to high-elevation habitats. This species has been observed on Arrastre Creek on the San Bernardino National Forest. It is primarily a bat of coniferous forests but also occurs seasonally in riparian and desert habitats. It uses abandoned buildings, cliff crevices, exfoliating tree bark, and hollows within snags as summer day roosts; caves and mine tunnels for hibernation. The project site provides marginally suitable foraging and roosting habitat for this species and its potential to occur on the project site is considered to be moderate for foraging and roosting.

Yuma Myotis (*Myotis yumanensis*). The Yuma myotis is a Federal Species of Concern and a relatively small bat that occurs statewide. This species is closely associated with water and wooded canyon bottoms throughout its range. Caves and old buildings are preferred roosting habitats, with roosts numbering up to 2,000 individuals. The project site provides potentially suitable foraging habitat for this species and the potential for this species to forage on the project site is considered to be moderate; however, this species is not expected to roost on the project site.

Pacific Western Big-eared Bat (*Plecotus townsendii pallescens*). The Pacific western big-eared bat occurs throughout California and is a Federal Species of Concern and State Species of Special Concern. In the southern portion of the state, the subspecies, *P.t. pallescens*, occupies a variety of communities, including oak woodlands, arid deserts, grasslands, and high-elevation forests and meadows. Known roosting sites in California include mines, caves, and buildings. The project site would provide foraging habitat for this species and it has a moderate potential to forage on the project site; however, no suitable roosting habitat is present.

Critical Habitat

The site is not located within any critical habitat designated areas for federally listed species.

Wildlife Movement

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (e.g., juvenile animals from natal areas, individuals extending range distributions); (2) seasonal migration; and (3) movements related to home range activities (e.g., foraging for food or water, defending territories, searching for mates, accessing breeding areas, or securing cover). A number of terms have been used in various wildlife movement studies, such as “travel route,” “wildlife corridor,” and “wildlife crossing” to refer to areas in which wildlife move from one area to another.

To clarify the meaning of these terms and to facilitate the discussion on wildlife movement in this analysis, these terms are briefly defined as follows:

- *Travel Route*: a landscape feature such as a ridgeline, drainage, canyon, or riparian strip within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g., water, food, cover, den sites).

- *Wildlife Corridor*: a piece of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another.
- *Wildlife Crossing:* a small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement.

As defined above, the project site does not contain wildlife crossings or corridors. Nonetheless, the project site could be used as a travel route connecting forest habitat to the north with Big Bear Lake. However, direct connection to open space areas north and east of the project site are obstructed by SR-38. The importance of this travel route may be diminished by the vehicle traffic hazard associated with crossing SR-38 as well as the availability of similar habitat immediately adjacent to the east of the project site.

Migratory Bird Treaty Act

The Migratory Bird Treat Act (MBTA) established in 1918 the federal prohibition, unless permitted by regulations, to pursue, hunt, take, capture, or kill any migratory bird species or any part, nest, or egg of any such migratory bird species covered by the act. Impacts to any bird (or its nest) listed by the MBTA are considered punishable by fines and/or imprisonment. Additionally, impacts to nesting MBTA-listed species are considered a significant impact by California Environmental Quality Act (CEQA) per guideline section.

There are a large number of bird species that were observed to use the project site for nesting. Due to the difficulty locating nests of cavity-nesting and other species of birds, a preconstruction nesting bird survey is not feasible. Therefore, the project should time tree removal to occur outside of the nesting period for birds, generally February through July.

Jurisdictional Waters

A Delineation of Jurisdictional Waters was prepared during the preparation of the 2005 Final EIR in order to delineate U.S. Army Corps of Engineers (USACE) and California Department of Fish and Game (CDFG) jurisdictional authority for unnamed drainages located within the project site.

Prior to visiting the site, RBF conducted a review of U.S. Geological Survey (USGS) topographic maps (Quadrangle *Fawnskin, California*, dated 1996) and aerial photographs to identify areas that *may* fall under an agency's jurisdiction. USACE jurisdictional wetlands are delineated using the methods outlined in the USACE Wetland Delineation Manual (1987) based on hydrologic and edaphic features of the site, and on the vegetation composition of the site. Non-wetland waters of the United States (U.S.) are delineated based on the limits of the ordinary high water mark (OHWM) as determined by erosion, the deposition of vegetation or debris, and changes in the vegetation. Generally, CDFG takes jurisdiction to the bank of the stream/channels or to the limit of the adjacent

riparian vegetation, whichever is greater. Analysis of the project site consists of field surveys and verification of current conditions conducted in March 2002.

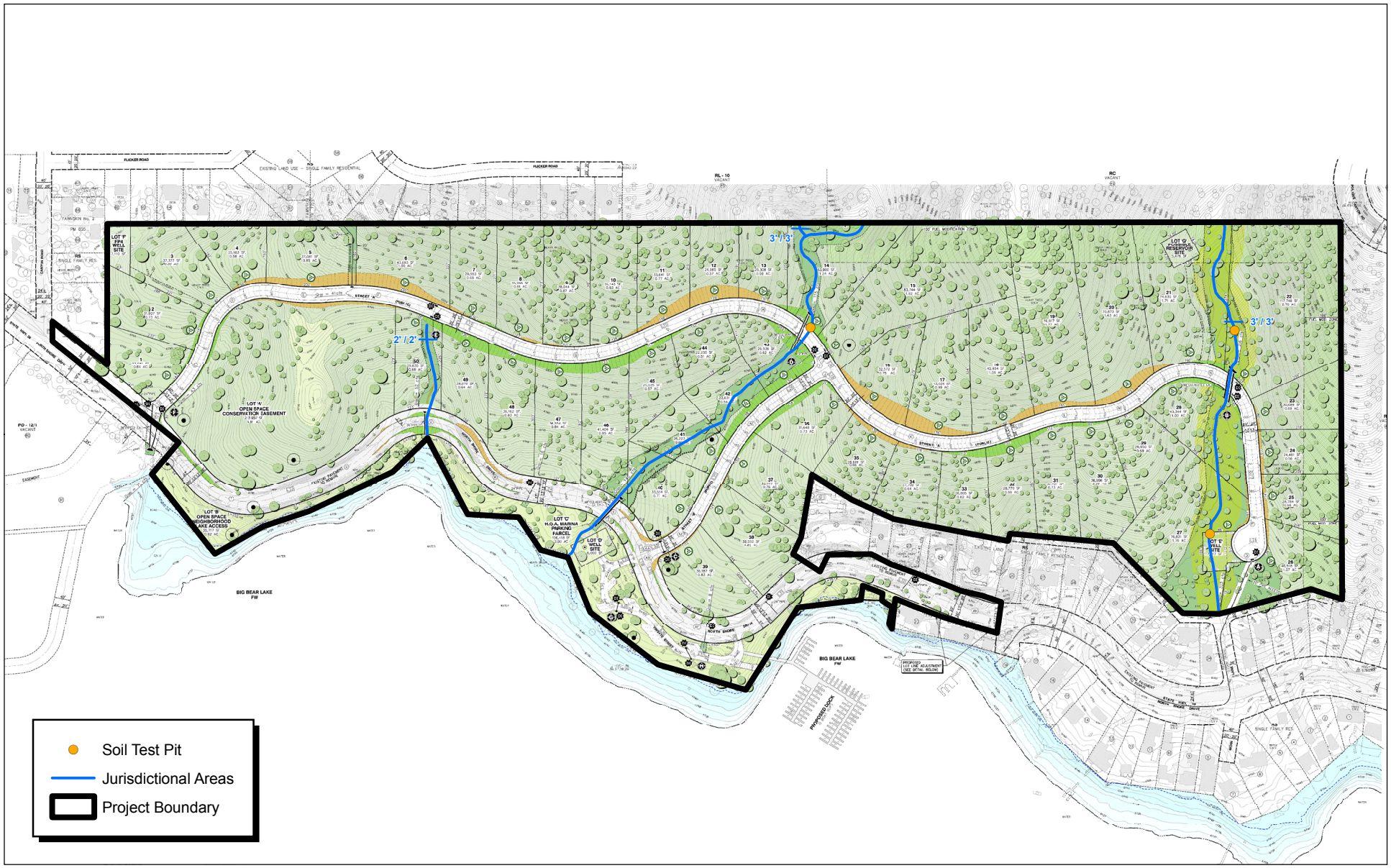
Vegetation within the drainages of the project site consisted of upland habitat, dominated by Jeffrey pines. Soils within the drainage were documented to be silty-sand (large grain). Soil samples taken on-site were generally dry and lacked characteristics of hydric soils (i.e., odor, streaking, mottling). No flow within the on-site drainages was observed during the March 15, 2002, field visit. However, evidence of an OHWM was observed within the drainages, primarily indicated by sediment deposits. It should also be noted that Big Bear Lake adjoins the project site to the south. Based on discussions with the Big Bear Municipal Water District, the current water level of Big Bear Lake (as of May 27, 2009) is 6,738.1-feet above msl. The OHWM is reported to be 6,743.2 feet above msl.

Based on the results of the field observations and data collection, 0.15 acre of USACE jurisdictional waters of the U.S. were identified within the project site. In addition to on-site ephemeral drainages, USACE considers Big Bear Lake jurisdictional. USACE's jurisdictional limits are delineated at the high water line, which is reported to be at 6,743.2-foot elevation (and below).

4.3.2 - Regulatory Setting

This regulatory framework identifies the federal, state, and local statutes, ordinances, or policies that govern the conservation and protection of biological resources and must be considered during the decision-making process for projects that have the potential to affect biological resources. In this context, biological resources are defined to include the following:

- Any species identified as a federal candidate for listing, a sensitive species, or as having special status in local or regional plans, policies or regulations, by the CDFG or USFWS;
- Habitat designated as State Sensitive Habitats by the CDFG Natural Heritage Program;
- Wetlands or other "waters of the U.S." afforded protection pursuant to Section 404 of the Clean Water Act (CWA);
- Riparian or wetland habitats afforded protection pursuant to Section 1600 of the State Fish and Game Code (Code);
- Native resident or migratory wildlife corridors;
- Native wildlife nursery sites;
- Occupied nesting habitat for birds afforded protection pursuant to the MBTA; and
- Plant and wildlife habitats afforded protection pursuant to Habitat Conservation Plans (HCPs) and Natural Community Conservation Plans (NCCPs).



Source: Hicks & Hartwick, Inc. (July, 2009), Bon Terra Consulting (July, 2003), Tim Krantz (2008), Scott White & MBA.

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Exhibit 4.3-3
Jurisdictional Map

SAN BERNARDINO COUNTY
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Federal

Federal Endangered Species Act

The purposes of this Act are to provide a means to conserve the ecosystems that endangered and threatened species depend on and to provide a program for conservation and recovery of these species. FESA defines species as "endangered" and "threatened" and provides regulatory protection for any species so designated. Section 9 of the FESA prohibits the take of species listed by the USFWS as threatened or endangered. As defined in the FESA, take means "...to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that take cannot always be avoided, Section 10(a) of the FESA includes provisions for take that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (incidental take permits) may be issued if taking is incidental and does not jeopardize the survival and recovery of the species in the wild.

Section 7(a)(2) of the FESA requires all federal agencies, including the USFWS, to evaluate the proposed project with respect to any species proposed for listing or already listed as endangered or threatened and their critical habitat, if any is proposed or designated. Federal agencies must undertake programs for the conservation of endangered and threatened species, and are prohibited from authorizing, funding, or carrying out any action that will jeopardize a listed species or destroy or modify its "critical habitat." As defined in the FESA, "individuals, organizations, states, local governments, and other non-Federal entities are affected by the designation of critical habitat only if their actions occur on federal lands, require a Federal permit, license, or other authorization, or involve federal funding."

Migratory Bird Treaty Act

The MBTA makes it unlawful to pursue, capture, kill, or possess or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union. As with the FESA, the MBTA authorizes the Secretary of the Interior to issue permits for incidental take.

Section 404 of the Federal Clean Water Act

Section 404 of the Federal Clean Water Act (CWA), which is administered by the USACE, regulates the discharge of dredge and fill material into waters of the United States. USACE has established a series of nationwide permits that authorize certain activities in waters of the U.S., provided that a proposed activity can demonstrate compliance with standard conditions. Normally, USACE requires an individual permit for an activity that will affect an area equal to or in excess of 0.5 acre of waters of the U.S. Projects that result in impacts to less than 0.5 acre of waters of the U.S. can normally be conducted pursuant to one of the nationwide permits, if consistent with the standard permit conditions. However, USACE has discretionary authority to require an Environmental Impact Statement (EIS) for projects that result in impacts to an area 0.5 acre and above. Use of any nationwide permit is contingent on the activities having no impacts to endangered species.

State

Section 2080 and 2081 of the State Fish and Game Code

Section 2080 of the Code states that no person shall import into this state (California), export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission (State Fish and Game Commission) determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, the Native Plant Protection Act, or the California Desert Native Plants Act. Under Section 2081 of the Code, the CDFG may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or memoranda of understanding if: 1) the take is incidental to an otherwise lawful activity; 2) impacts of the authorized take are minimized and fully mitigated; 3) the permit is consistent with any regulations adopted pursuant to any recovery plan for the species; and 4) the applicant ensures adequate funding to implement the measures required by CDFG. CDFG shall make this determination based on the best scientific and other information that is reasonably available and shall include consideration of the species' capability to survive and reproduce.

Section 3503 of the State Fish and Game Code

Section 3503 of the Code states, "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto."

Section 1600 of the State Fish and Game Code

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California are subject to the regulatory authority of the CDFG pursuant to Sections 1600 through 1602 of the Code, requiring preparation of a Streambed Alteration Agreement. Under the Code, a stream is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Included are watercourses with surface or subsurface flows that support or have supported riparian vegetation. CDFG also has jurisdiction within altered or artificial waterways based on the value of those waterways to fish and wildlife, and also has jurisdiction over dry washes that carry water ephemerally during storm events.

Native Plant Protection Act

The Native Plant Protection Act includes measures to preserve, protect, and enhance rare and endangered native plants. The definition of "rare and endangered" differs from those contained in the CESA. However, the list of native plants afforded protection pursuant to this act includes those listed as rare and endangered under the CESA. The Native Plant Protection Act provides limitations on take as follows: "...no person will import into this State, or take, possess, or sell within this State" any rare or endangered native plant, except in compliance with provisions of the act. Individual land owners are required to notify the CDFG at least 10 days in advance of changing land uses to allow the CDFG to salvage any rare or endangered native plant material.

Natural Community Conservation Planning Program

The NCCP Program, initiated by Governor Pete Wilson in 1991 and managed by the CDFG, is designed to conserve multiple species and their habitats, while also providing for the compatible use of private land. Through local planning, the NCCP planning process protects wildlife and habitat before the landscape becomes so fragmented or degraded by development that listings are required under the FESA. Instead of saving small, disconnected units of habitat for just one species at a time, agencies, local jurisdictions, and other interested parties have an opportunity, through the NCCP, to work cooperatively to develop plans that consider broad landscapes, or "ecosystems," and the needs of many species. Partners enroll in the programs and, by mutual consent, habitat areas with high conservation values are set aside and may not be developed. Partners also agree to study, monitor, and develop management plans for these "reserve" areas. The program provides a process for fostering economic growth by allowing approved development in enrolled areas with lower conservation values.

Carbonate Plant Critical Habitat/San Bernardino Mountains Carbonate Habitat Management Strategy

On January 23, 2003, the USFWS designated critical habitat for five federally-listed plants on 13,180 acres of land in the San Bernardino Mountains. The five plants are Cushenbury milk-vetch (*Astragalus albens*), Cushenbury buckwheat (*Eriogonum ovalifolium var. vineum*), San Bernardino Mountains bladderpod (*Lesqueralla kingii ssp. bernardina)*, Cushenbery oxytheca (*Oxytheca parishii var. goodmaniana*), and Parish's daisy (*Erigeron parishii*). Critical habitat for these species covers 11,980 acres between the western edge of White Mountain and the eastern edge of Rattlesnake Canyon, 685 acres northeast of Big Bear Lake, and 515 acres of San Bernardino National Forest lands on Sugarlump Ridge south of Bear Valley. The project site is not located in any areas designated as critical habitat for these five carbonate plants. In addition, a Carbonate Habitat Management Strategy is currently being developed to address the long-term conservation of carbonate habitat in the San Bernardino Mountains. The strategy identifies potential and occupied carbonate habitat and actions to conserve carbonate plants. Plant surveys on the project site have not identified any carbonate habitat on the project site that may be subject to conservation measures outlined in the Carbonate Habitat Management Strategy.

County

County of San Bernardino General Plan

The County of San Bernardino General Plan contains goals and policies/actions designed to preserve biological resources that apply to development within the County's jurisdiction. The general plan contains a list of Rare, Endangered and Threatened species that occur in San Bernardino County, adverse effects on which result in a mandatory finding of significant effect pursuant to State CEQA Guidelines, Section 15065 if individuals are adversely affected by County land use map changes and discretionary land use approvals, thereby requiring the preparation of an EIR. Listed plant species identified within the General Plan with potential to occur on the Project site include Parish's

checkerbloom and bird's foot checkerbloom. Listed wildlife species identified within the General Plan with potential to occur on the Project site include the southern rubber boa and bald eagle. The survey results and documentation contained in Appendix B have been prepared as supporting documentation for this Revised and Recirculated Draft EIR, which satisfies the requirements of the County of San Bernardino General Plan.

County of San Bernardino Biotic Resources Overlay District

The project site lies within a County of San Bernardino Biotic Resources (BR) Overlay District. The purpose of the BR Overlay District is to "implement General Plan policies regarding the protection and conservation of beneficial rare and endangered plants and animal resources and their habitats which have been identified within unincorporated areas of the county" (Article 2, 85.030201). The County General Plan implements the intent of the BR Overlay District by requiring all proposed land uses with a minimum of 25 percent of the total proposed development area within the BR Overlay District to prepare a biological technical report identifying impacts to biological resources and mitigation measures designed to reduce or eliminate Project related impacts. The documentation included in Appendix B is intended to satisfy the requirements of the BR Overlay District.

Plant Protection and Management Ordinance – County of San Bernardino Development Code

The County of San Bernardino requires under Chapter 8, Division 9 of the County Development Code (Plant Protection and Management) that development on all private and public lands within the unincorporated areas of San Bernardino County is subject to specific requirements. Removal of any native plant from unincorporated areas of San Bernardino requires the approval of a removal permit. Additionally, the following sections of the ordinance would apply to native plants on the project site:

89.0110(b) The provisions of this Division shall not authorize the removal of perch trees within identified American bald eagle habitat.

89.0115(c) The reviewing authority may require certification from an appropriate tree expert or native plant expert that such tree removals are appropriate, supportive of a healthy environment and are in compliance with the provisions of this chapter.

89.0205 Any coniferous tree or portion thereof, including stumps, shall be treated in accordance with one of the methods specified in Sections 89.0205 and 89.0210 within fifteen (15) days after such a tree or portion of such a tree has been cut.

4.3.3 - Thresholds of Significance

The following criteria for establishing the significance of potential impacts on biological resources were derived from Appendix G of the CEQA Guidelines. A significant impact would occur if a proposed project:

a) Has a substantial adverse effect, through either direct or indirect modification of potentially suitable or occupied habitat, or direct take, to any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS;

b) Has an adverse effect on existing riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS;

c) Has a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

d) Interferes substantially with the movement of any native resident or migratory fish or wildlife species or with established native, resident, or migratory wildlife corridors or impedes the use of native wildlife nursery sites;

e) Conflicts with regional policies or other local policies or ordinances protecting biological resources; and

f) Conflicts with approved local, regional, or state habitat conservation plans.

4.3.4 - Project Impact Analysis

Sensitive Plant Communities and Plants

Pebble Plains. A total of 0.69 acre of pebble plain habitat occurs on-site; however, all of this habitat would be permanently preserved in an Open Space/Conservation easement consisting of a 4.91-acre easement (Lot A) at the westerly end of the project site. The 0.69 acre site is near to the center of the easement area, which would be buffered from future development of adjacent residential lots. Approximately 1,511 acres of pebble plain are known to exist in the San Bernardino Mountains (Krantz, 2008), 60 percent (906 acres) of which occurs on public lands. Development of the Proposed Alternative Project would not result in the removal of any of the pebble plain that occurs on the project site.

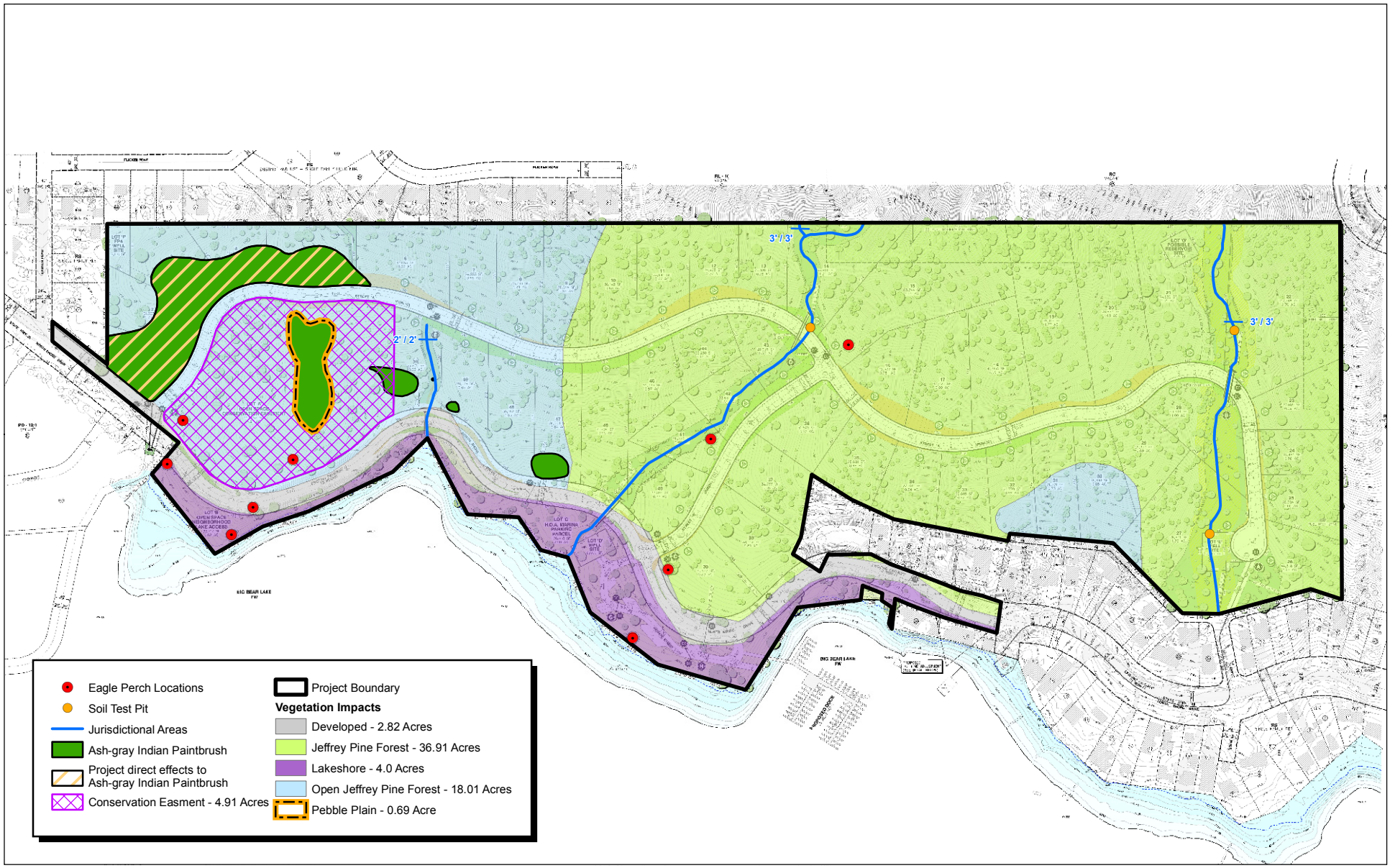
Special Status Plant Species Known to Occur on the Project Site

One Federally-listed Threatened and CNPS List 1B species, ash-gray Indian paintbrush; and five CNPS List 1B species, Parish's rock cress, Big Bear Valley woollypod, silver-haired ivesia, purple monkeyflower, and Bear Valley phlox, were observed on the project site during the 2002, 2007, and 2008 botanical surveys. The surveys identified an herbaceous layer of Wright's matting buckwheat (in the western half of the project site) and found inclusions of ash-gray Indian paintbrush and Parish's rock cress throughout an approximate 18.01-acre area of open Jeffrey pine forest. Silver haired ivesia was found to be concentrated entirely within the project site's mapped pebble plain habitat. Bear Valley woollypod was found in patches scattered throughout Jeffrey pine forest habitat on the project site. Purple monkeyflower was found to be widely distributed on the large pebble plain in the conservation area, with a small portion of the population extending down the draw to the east

into the southern half of proposed Lot 50. Finally Bear Valley phlox was found to be distributed in the open black oak woodland and under Jeffrey pines.

The 2008 survey concluded that a total of 7.7 acres of occupied ash-gray paintbrush habitat are present within the project site: a 0.11-acre area in the southernmost portions of proposed Lots 47 and 48, consisting of approximately 50 plants; a small 0.01-acre inclusion located at the rear of Lot 49; a single point with three plants located at the vernal spring on the rear portion of Lot 50; and a 0.11-acre on Lot 50; 4.91 acres within Lot A and the primary pebble plain habitat within the project site; 2.07 acres within Lots 1 – 5; and 0.5 acre within Road A, for a total of 7.7 acres of occupied habitat. While previous surveys indicated that development would result in the removal of 13.81 acres of open Jeffrey pine forest known to support ash-gray Indian paint brush, surveys conducted during drought-years may have over calculated the estimate of ash-gray Indian paintbrush or based the assumption on presence on the basis of Wright's matting buckwheat distribution (without regard to association with the ash-grey Indian paintbrush (Krantz 2008). The 2008 survey therefore concluded that the amount of occupied habitat of ash-gray Indian paintbrush to be approximately 7.71 acres instead of the 13.81 acres that had been estimated in the 2002 and 2007 surveys. The Applicant, nonetheless, proposes a 4.91-acre conservation easement within which is located 4.91 acres of occupied ash-gray Indian paint brush habitat surrounding a 0.69-acre pebble plain.

4.91 acres of occupied ash-gray Indian paint brush habitat in open Jeffrey pine surrounding the 0.69 acre of Pebble Plain habitat will be permanently preserved under a 4.91-acre conservation easement (refer to Exhibit 4.3-4). In addition, by protecting the most exemplary and best quality pebble plain habitat on-site, all six of the special status species observed on-site will also be protected. Based on the recommendations made by Krantz (2008), a 10-acre off-site mitigation site will be purchased as compensation for direct and indirect impacts to ash-gray Indian paintbrush outside the 4.91-acre conservation area. These 10 acres of pebble plain are private land located at the northern terminus of Dixie Lee Lane in the Sugarloaf area of Big Bear Valley. The 10 acres are fenced, high quality pebble plain that is one of the best remaining examples of pebble plain habitat in private ownership and will allow for mitigation for remaining impacts to the ash-gray Indian paintbrush present within Lots 1 – 5 (refer to Exhibit 4.3-4) to occur at a 3:1 ratio.



Source: Hicks & Hartwick, Inc. (July, 2009), Bon Terra Consulting (July 2003), Tim Krantz (2008), Scott White & MBA.

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Michael Brandman Associates

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Exhibit 4.3-4
Proposed Alternative Project Impacts Map

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Special Status Plant Species Potentially Occurring on the Project Site

Botanical surveys during 2002 and 2007 were limited in calculation capability on the project site and throughout southern California due to prolonged drought. Many plant species in the project region are either annual (i.e., complete their life cycles in a single year and then die) or perennial herbs (i.e., die back to the ground level each year and persist as underground bulbs or rootcrowns). In poor rainfall years, annual and perennial herbs may not have been visible, though they may have existed on a site as an inactive seed, bulb, or rootcrown. Most of the special status plants of the Big Bear area are perennial herbs, making a conclusive determination of "presence" or "absence" based on field surveys difficult during low rainfall years. However, previous reports of presence and determination of habitat quality may have plausibility in estimating the probability that a special status plant species might occur on the project site.

As a result of the drought conditions under which previous surveys had been conducted, Dr. Timothy Krantz performed a Supplemental Focused Rare Plant Survey within the project site in 2008, which was a year of normal precipitation. The Krantz survey (2008; see Appendix B) was able to confirm the presence and distribution of the plants in a normal rainfall year.

Special status plants known to occur on the project site are described above; special-status plants that could potentially occur on the project site, but that have not been identified on the project site during focused surveys conducted in 2002, 2007, or 2008, include six listed threatened or endangered species (bird's foot checkerbloom, San Bernardino bluegrass, California dandelion, Big Bear Valley sandwort, southern mountain buckwheat, and slender-petalled thelypodium); one CNPS List 1B and state-listed Rare species and Candidate for federal listing as Threatened or Endangered (Parish's checkerbloom); and 26 CNPS List 1B or 2 species as follows:

- Rock sandwort;
- Big Bear Valley milk vetch;
- Palmer's mariposa lily;
- San Bernardino Mountain owl's clover;
- Male fern;
- San Bernardino Mountains dudleya;
- Leafy buckwheat;
- San Bernardino Mountain gilia;
- Shaggy-haired alum root;
- Parish's alumroot;
- Short-sepaled lewisia;
- Lemon lily;
- Baldwin Lake linanthus;
- San Bernardino Mountain monkeyflower;
- Purple monkeyflower;
- Baja navarretia;
- Parish's yampah;
- Bear Valley phlox;
- Bear Valley pyrrocoma;
- San Bernardino butterweed;
- Prairie wedge grass;
- Southern jewelflower; and
- Grey-leaved violet.

Special Status Wildlife Species

The Proposed Alternative Project would result in the loss of potential habitat for several special status wildlife species potentially present on the project site. For those species expected to occur, potential impacts were evaluated for the habitat that the species is expected to occupy.

Reptiles

Implementation of the Proposed Alternative Project may result in impacts on special status reptile species. One federal Species of Concern, the southern sagebrush lizard, has been observed on the project site. Four additional species that are federal Species of Concern and/or State Species of Special Concern have potential to occur on the project site. These species are the silvery legless lizard, coastal western whiptail, San Bernardino ringneck snake, and San Bernardino Mountain kingsnake. The loss of potential habitat for these species would be considered less than significant due to the limited amount of habitat loss relative to the availability of habitat for these species in the region.

Intensive surveys for the State-listed Threatened southern rubber boa were conducted on the project site in the spring and summer of 2002 and an additional assessment was conducted by Dr. Glenn Stewart, PhD, Professor Eneritus of Zoology and Environmental Sciences, Cal Poly Pomona, in February 2007. Given the negative results of two independent focused survey techniques, the results of Dr. Stewart's assessment, and the lack of historical records in the immediate vicinity of the project site, the survey report concluded that this species has a low potential to occur on the project site.

Birds

Project implementation may result in impacts on special status bird species. Nineteen sensitive bird species (Federal Species of Concern, State Endangered Species and State Species of Special Concern) have potential to occur on the project site and are discussed below.

Bald Eagle. The bald eagle was taken off the federal list of threatened species, but remains on the State endangered species list. Small wintering populations of bald eagle often occur in scattered montane locations in the region. Big Bear Lake supports the largest wintering population of bald eagle in southern California and may include as many as 30 individuals in peak years. The bald eagle was observed using several trees on the project site for perch and roost locations. A records search also demonstrated that some of the most utilized perch and roost trees on the north shore of the lake are located on the project site. Given the limited distribution of wintering populations of bald eagles in southern California, removal of these trees and/or construction of uses in proximity to trees such that there would be a loss of perching or roosting habitat value for wintering bald eagles would be considered a significant impact. In addition, two pair of bald eagles were documented nesting at Big Bear during Spring/Summer 2007. As the bald eagle has recently nested at Big Bear, ongoing surveys of the project site during breeding season is recommended to verify the continued absence of nesting bald eagles on the project site.

Cooper's Hawk, Northern Goshawk, Sharp-shinned Hawk, Golden Eagle, Long-eared Owl, Ferruginous Hawk, Northern Harrier, White-tailed Kite, Merlin, American Peregrine Falcon, Osprey, Prairie Falcon, and California Spotted Owl. Proposed Alternative Project implementation would reduce the amount of foraging habitat for these species. This impact would contribute to the cumulative loss of foraging habitat for these raptor species. However, the loss of potential foraging habitat for these species would be considered adverse, but less than significant due to the limited amount of habitat loss relative to the availability of foraging habitat for these species in the San Bernardino Mountains and National Forest.

The Cooper's hawk, long-eared owl, white-tailed kite, and California spotted owl also have potential to nest on the project site. If an active raptor nest (common or special status species) were found on the project site, the loss of the nest would be considered a violation of the California Fish and Game Code Sections 3503, 3503.5, and 3513. The loss of any active raptor nest occurring on the project site would be considered significant.

Black Swift, Yellow Warbler, Hepatic Tanager, Purple Martin, and Gray Vireo. Proposed Alternative Project implementation would reduce the amount of foraging habitat for these species. In addition, the hepatic tanager and purple martin have potential to nest on the project site and implementation of the Proposed Alternative Project may impact active nests. The loss of potential habitat for these species would be considered adverse, but less than significant due to the limited amount of habitat loss relative to the availability of habitat for these species in the San Bernardino Mountains and National Forest.

Mammals

Project implementation may result in impacts on special status mammal species. No federally- and/or State-listed species have potential to occur on the project site. However, 11 Federal Species of Concern and/or State Species of Special Concern have potential to occur on the project site and are discussed below.

Pallid Bat, Spotted Bat, Small-Footed Myotis, Long-Eared Myotis, Occult Little Brown Bat, Fringed Myotis, Long-Legged Myotis, Yuma Myotis, and Pacific Western Big-Eared Bat. The project site provides suitable foraging habitat for these bat species. Proposed Alternative Project implementation would reduce the amount of foraging habitat for these species. The pallid bat, small-footed myotis, long-eared myotis, Occult little brown bat, fringed myotis, long-legged myotis, and Yuma myotis, also have potential to roost on the project site. This impact would contribute to the cumulative loss of foraging and roosting habitat for these bat species. However, the loss of potential habitat for these species would be considered adverse, but less than significant, due to the limited amount of habitat loss relative to the availability of foraging and roosting habitat for these species in the San Bernardino Mountains and National Forest.

San Bernardino Mountain Flying Squirrel. Although focused surveys for the flying squirrel were negative, the project site provides suitable foraging and breeding habitat for this species. Proposed Alternative Project implementation would impact habitat for this species. However, the loss of potential habitat would be considered adverse, but less than significant, due to the limited amount of habitat loss relative to the availability of habitat for this species in the San Bernardino Mountains and National Forest.

Direct Impacts

Flora and Vegetation Type Impacts

A total of 61.87 acres of native and non-native vegetation types, including developed areas, would be impacted by the Proposed Alternative Project.

Jeffrey Pine Forest

A total of 50.72 acres of Jeffrey pine forest, including 13.81 acres of open Jeffrey pine forest, would be impacted by Proposed Alternative Project implementation. Approximately 58,526 acres of Jeffrey pine forest occurs in the San Bernardino National Forest and 141,604 acres in the Cleveland, San Bernardino, Angeles and Los Padres National Forests collectively. Approximately 4.2 acres of open Jeffrey pine forest will be permanently preserved by a conservation easement. Impacts on this vegetation type would be considered less than significant since this vegetation type is common throughout the San Bernardino Mountains and other mountain ranges in the region.

Lake Shoreline

A total of 4.0 acres of ruderal lake shoreline would be impacted by Proposed Alternative Project implementation. Man-made lakes are essentially distinct ecosystems, with an aquatic fauna and flora that bears little resemblance to what naturally occurs in the streams that formed them. Impacts on this vegetation type would be considered less than significant since Big Bear Lake is a man-made reservoir created by the construction of Bear Valley Dam.

Pebble Plains

A total of 0.69 acre of pebble plain habitat would be preserved in an open space conservation easement under the Proposed Alternative Project. An additional 10 acres of pebble plain habitat will be preserved through purchase on an off-site mitigation area. Conservation efforts to protect the pebble plain habitat are discussed above, under Special Status Biological Resources Impacts.

Developed

A total of 2.82 acres of disturbed vegetation in developed areas (SR-38) would be impacted by Proposed Alternative Project implementation. Impacts on this vegetation type would not be considered significant since this vegetation type is considered to have a low biological value.

Indirect Impacts

Wildlife Impacts

The loss of habitat, loss of wildlife, wildlife displacement, and habitat fragmentation that would result from construction of the Proposed Alternative Project would not be considered significant because these impacts would not substantially diminish habitat for wildlife in the region nor reduce any specific wildlife populations in the region to below self-sustaining numbers.

Indirect Impacts

Indirect impacts are those related to disturbance by construction (such as noise, dust, and urban pollutants) and long-term use of the project site and its effect on the adjacent habitat areas. The indirect impact discussion below includes a general assessment of the potential indirect affects (noise, dust and urban pollutants, lighting, human activity, and non-native species introduction), of the construction and operation of the Proposed Alternative Project. Particular focus is placed on the indirect effects on the natural open space area from the Proposed Alternative Project, collectively referred to as edge effects.

Edge effects occur where development, including roads, takes place adjacent to natural open space areas. Edge effects threaten the ecological integrity, recreational experience, aesthetic quality, public investment, and safety operations of preserved or undeveloped natural areas located adjacent to developed areas. When development is configured in a manner that creates a high ratio of development edge to natural open space, there is an increase in the potential impacts caused by human use (indirect impacts). These indirect effects that address both the short-term construction and long-term use of the project site are outlined below.

Noise Impacts

Noise levels on the project site would increase over present levels during and upon completion of construction of the Proposed Alternative Project. During construction, temporary noise impacts have the potential to disrupt foraging, nesting, roosting, and denning activities for a variety of wildlife species. Upon completion of construction, noise levels on the project site would increase as a result of increased human activity associated with residential uses. Both short and long-term noise impacts

could potentially disrupt the foraging and roosting potential of the site for the bald eagle. Any interruption of the foraging and/or roosting behavior of the bald eagle would be considered a significant impact.

Both short- and long-term residential noise impacts on the bald eagle would be considered an unavoidable significant impact of the Proposed Alternative Project.

Increased Dust and Urban Pollutants

Grading activities would disturb soils and result in the accumulation of dust on the surface of the leaves of trees, shrubs, and herbs in the natural open space areas adjacent to the project site. The respiratory function of the plants in these areas would be impaired when dust accumulation is excessive. These impacts are considered adverse, though less than significant.

Night Lighting

Lighting of the residential units would inadvertently result in an indirect effect on the behavioral patterns of nocturnal and crepuscular (i.e., active at dawn and dusk) wildlife that are present along the boundaries of the natural areas of the project site. Of particular concern is the effect on small ground-dwelling animals that use the darkness to hide from predators, and on owls, which are specialized night foragers. In addition, the increase in night lighting could discourage nesting and roosting along the lake shore. Most notably, lighting associated with the Proposed Alternative Project could disrupt roosting behavior of the bald eagle on the project site. This increased lighting, in conjunction with the increased noise and habitat loss, would be considered potentially significant.

Human Activity

The increase in human activity (i.e., noise, foot traffic) would increase the disturbance of natural open space adjacent to the project site. Human disturbance could disrupt normal foraging and breeding behavior of wildlife remaining in adjacent areas, diminishing the value of these open space habitat areas. Most notably, residential activity associated with the Proposed Alternative Project could disrupt foraging and roosting behavior of the bald eagle on the project site.

Non-Native Species Introduction

The native habitat types within the natural open space areas adjacent to the project site would be subject to greater pressure from non-native plant species within the developed portions of the project site. Areas that have undergone disturbance generally contain a high number of non-native grasses and forbs that can successfully out-compete the native plants in the region. This will be especially true after initial project grading of the project site. Should non-native plants establish themselves in these areas prior to the establishment of native plant species or non-native/non-invasive plant species in the landscape areas, the non-natives may become invasive in the natural open space areas. Left uncontrolled, these “weeds” may begin encroaching into the adjacent natural areas. These impacts could become significant if uncontrolled.

Jurisdictional Waters

Waters of the U.S. (Non-Wetland) Determination

Based on the results of the field observations and data collection, RBF identified 0.15 acre of USACE jurisdictional "waters of the U.S." within the proposed project site. The drainages are ephemeral; Big Bear Lake, although not included in the acreage calculation, is also considered jurisdictional by USACE. Utilizing the most current development plans, it was determined that the proposed improvements would impact up to 0.04 acres of waters of the U.S. under USACE jurisdiction. A boat launch ramp will be constructed on the existing land without fill or drainage occurring in the Marina and, therefore, would not impact waters of the U.S.

California Department of Fish and Game (1602) Jurisdiction

Based on the results of the field observations and data collection, RBF identified 0.15 acre of CDFG jurisdictional streambed. Utilizing the most current development plans, it was determined that the proposed improvements would impact up to 0.04 acre of CDFG jurisdiction waters of the State.

Wildlife Movement

The development of the project site would not impact wildlife corridors, by definition, but may affect local travel routes. Construction of the residential areas would result in reduced connectivity between Big Bear Lake as a water source to the contiguous open spaces on and to the north of the project site. Additionally, construction of the Proposed Alternative Project would result in increased traffic on the project site by residents that would further impede movement of terrestrial wildlife currently crossing the site and SR-38. Although this impact is considered locally adverse, it is not considered significant because the impact does not substantially affect a regionally important wildlife movement corridor.

Regional and Local Policies/Plans

County of San Bernardino General Plan

The project site is located in unincorporated San Bernardino County and is subject to the provisions and policies of the County of San Bernardino General Plan. The General Plan contains a list of species considered Rare, Threatened, or Endangered by the County. Projects potentially impacting County-listed species must prepare an EIR to determine the significance of impacts on these species. Two plant species identified within the General Plan, Parish's checkerbloom and bird's foot checkerbloom, have the potential to occur on the project site. Krantz's 2008 Focused Survey, during a normal precipitation year, concluded that neither of the two plant species were identified on site and they are not considered likely to occur on site.

County of San Bernardino Biotic Resources Overlay District

The intent of the BR Overlay District is to require the preparation of a biological technical report for projects within the BR Overlay District identifying impacts to biological resources and mitigation measures designed to reduce or eliminate Proposed Alternative Project-related impacts. The

biological technical reports prepared as part of this Revised and Recirculated Draft EIR are intended to satisfy the requirements of the BR Overlay District.

Plant Protection and Management Ordinance – County of San Bernardino Development Code

Title 8, Division 9 of the San Bernardino County Development Code contains policies and requirements applicable to the project site, including Section 89.0110(a), 89.0115(c), and 89.0205. Section 89.0110(b) states that the provisions of this Division shall not authorize the removal of perch trees within identified American bald eagle habitat.

Section 89.0115(c) requires that the County "may require certification from an appropriate tree expert or native plant expert that such tree removals are appropriate, supportive of a healthy environment and are in compliance with the provisions of this chapter." The Forester's Report and the Botanical Survey Letter Report are intended to satisfy the requirements of this section (refer to Appendix B of this Revised and Recirculated Draft EIR). The County shall make a determination based on the evidence presented herein and in the Forester's Report as to the significance of the Proposed Alternative Project impacts to native plants and compliance with the provisions of Division 9 of the County Development Code.

The intent of Section 89.0205 is to treat coniferous tree species such that they don't present a risk of fire, and spread tree insect pests and infection. Compliance with this Section would be enforced by the County standard conditions and requirements during construction of the Proposed Alternative Project.

Migratory Bird Treaty Act

Implementation of the Proposed Alternative Project may impact the nests of species covered by the MBTA, including the Cooper's hawk, purple martin, and hepatic tanager.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act will continue to protect the bald eagle following delisting under the Federal Endangered Species Act. Originally passed in 1940 to protect bald eagles, the Eagle Act was amended in 1962 to protect golden eagles as well, by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 U.S.C. 668(a); 50 CFR 22). "Take" includes pursue, shoot, shoot at, poison, would, kill capture, trap, collect, molest or disturb (16 U.S.C. 668(c); 50 CFR 22.3).

4.3.5 - Mitigation Measures

The mitigation measures associated with the Proposed Alternative Project are described below.

Special Status Biological Resources

Special Status Plants and Plant Communities

BR-1a Prior to the initiation of clearing or grading activities on the project site, the off-site 10-acre Dixie Lee Lane Pebble Plain Habitat shall be established as a conservation easement and a non-wasting endowment will be established for the monitoring and management of the preservation of the 10-acre site by the management entity (e.g., San Bernardino Mountains Land Trust (SBMLT) or other land stewardship entity) in perpetuity.

BR-1b Prior to the initiation of clearing or grading activities on the project site, the 4.91-acre on-site conservation easement shall be established, the management entity will be approved by the CDFG, and a non-wasting endowment will be established for the monitoring and management of the preservation of the proposed conservation easement by the management entity in perpetuity.

BR-1c Construction to the rear portions of Lots 47, 48, 49, and 50 shall be restricted by means of building envelopes or building setback lines to prevent construction in the occupied ash-gray paintbrush habitat, wherever feasible.

BR-1d Long-term conservation areas will be actively managed to prevent edge-effects from existing and proposed adjacent land uses. A habitat management plan (HMP) will be developed for the on-site Conservation Easement area. The HMP shall address management of the rare plant preserve with respect to the following indirect impacts:

- Removal and control of invasive non-native plants;
- Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation;
- Alteration of surface hydrological conditions caused by irrigation on adjacent lots, road runoff, or water diversions installed for erosion control;
- Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes.

The HMP shall be administrered by the SBMLT or other land stewardship entity. Funding for implementation of habitat management measures shall be derived from interest earned from the habitat management endowment.

Special Status Wildlife

BR-2 Trees and downed logs shall remain in place, to the extent that clearing is not required by the development process, and a 50-foot setback (measured on each side of the centerline) must be maintained along the deepest ravine at the eastern edge of the property. This measure will serve to preserve habitat for such species as southern rubber boa.

BR-3 The project proponent shall have a biologist qualified with San Bernardino flying squirrel (SBFS) as a monitor during tree removal.

Minimize the number of trees, snags, and downed wood removed for project implementation. Compensating the removal of snags containing cavities; this would be achieved by constructing and erecting two nest boxes and one aggregate box per snag removed. Appendix B of this Revised and Recirculated Draft EIR provides the specifications of the nest and aggregate boxes (Flying Squirrels 2007). These boxes should be located on the adjacent U.S. Forest Service (USFS) land (with their permission) and the locations marked with a global positioning system. The locations of the boxes shall be provided to the USFS so that their biologists could monitor the boxes for occupation by SBFS.

Provide new homeowners with a flyer that would provide information on the biology of SBFS and how they are susceptible to depredation by cats. The flyer would also outline steps that homeowners could take to reduce their urban edge effects.

BR-4 Trees identified in Exhibits 3 and 4 of the Bald Eagle Survey Report (Appendix B of this Revised and Recirculated Draft EIR) as eagle perch locations shall be preserved in place upon project completion. If any of the designated perch trees should become hazardous and need to be taken down, replacement will be at a 5:1 ratio with the creation of artificial perch trees along shoreline designated open space. Any development that may occur within the project site and in the individual lots must avoid impacts to trees larger than 24 inches diameter breast height (dbh) and their root structures to the maximum extent feasible. If any additional non-perch trees on-site larger than 24 inches dbh are removed, then a replacement ratio of 2:1 shall be required and replacement trees shall be 24-inch box trees or larger. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.

BR-5 Prior to vegetation clearing, grading, or other disturbance, the project site shall be surveyed to identify all large trees (i.e., greater than 20 inches in diameter at 4.5 feet from the ground) within 600 feet from the high water line. Trees identified on the project site as having a diameter in excess of 20 inches at 4.5 feet from the ground within 600 feet of the shoreline shall be documented and tagged. Any development that may occur within the project site and in the individual lots shall avoid impacts to tagged trees and their root structures. If such trees cannot be avoided, their removal shall be coordinated with the County of San Bernardino to minimize impacts to the extent feasible. All construction or landscaping improvements, including irrigation, will be prohibited on or around the

exposed root structures or within the dripline of these trees. These restrictions on development of individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.

BR-6 Seven days prior to the onset of construction activities, a qualified biologist shall survey within the limits of project disturbance for the presence of any active raptor nests. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG.

If nesting activity is present at any raptor nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for raptors in the region of the project site normally occurs from February 1 to June 30. To protect any nest site, the following restrictions on construction are required between February 1 and June 30 (or until nests are no longer active as determined by a qualified biologist): (1) clearing limits shall be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying shall not be allowed within 200 feet of any occupied nest. Any encroachment into the 300/200-foot buffer area around the known nest shall only be allowed if it is determined by a qualified biologist that the proposed activity shall not disturb the nest occupants. Construction during the nesting season can occur only at the sites if a qualified biologist has determined that fledglings have left the nest.

BR-7 Vegetation removal, clearing, and grading on the project site should be performed outside of the breeding and nesting season (between February 1 and June 30), when feasible, to minimize the effects of these activities on breeding activities of migratory birds and other species. If clearing occurs during breeding season, a 30-day clearance survey for nesting birds shall be conducted. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG. If nesting activity is present at any nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code.

BR-8 The use of the boat dock for motorized boating shall be prohibited between the dates of December 1 and April 1. No motorized boats shall be allowed to launch or moor in the vicinity of the boat dock at any time during this period. This restriction shall be clearly displayed on signage at the entrance to the parking lot and on the boat dock visible from both land and water. This requirement shall also be published in the Homeowner's Association Conditions, Covenants & Restrictions (CC&Rs).

Sensitive Natural Communities/Habitats

Wildlife Impacts/Indirect Impacts

BR-9 Street lamps on the project site shall not exceed 20 feet in height, shall be fully shielded to focus light onto the street surface and shall avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights shall utilize low color temperature lighting (e.g., red or orange).

BR-10 Outdoor lighting for proposed homes on the individual tentative tracts shall not exceed 1,000 lumens. Furthermore, residential outdoor lighting shall not exceed 20 feet in height and must be shielded and focused downward to avoid lighting spillover onto adjacent open space or properties. These restrictions on outdoor lighting of the individual tentative tracts must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This requirement shall also be published in the Homeowner's Association CC&Rs.

BR-11 To limit the amount of human disturbance on adjacent natural open space areas, signs shall be posted along the northern and eastern perimeter of the project site where the property boundary abuts USFS open space with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash at all times."

In addition, a requirement stating that residents shall keep out of adjacent open space areas to the north with the exception of designated trails will be published in the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents.

BR-12 Prior to recordation of the final map, a landscaping plan for the entire tract shall be prepared (inclusive of a plant palette) with an emphasis on native trees and plant species, and shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review shall determine that invasive, non-native plant species are not to be used in the proposed landscaping. The biologist will suggest appropriate native plant substitutes or non-invasive, non-native plants. A note shall be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform to the overall approved tract map landscaping plan. A requirement shall be included stating that residents shall include a restriction of the use of tree and plant species to only trees/plants approved per the overall tract map landscaping plan, the Homeowner Association CC&Rs shall also restrict (individual lot owners) to use only tree and plant species approved per the overall tract map landscaping plan.

Jurisdictional Delineation

Per the direction of the CDFG, all unavoidable impacts to State and Federal jurisdictional lakes, streams, and associated habitat shall be compensated for with the creation and/or restoration of in-kind habitat on-site and/or off-site at a minimum 3:1 replacement-to-impact ratio. Additional

requirements may be required through the permitting process depending on the quality of habitat impacted, project design and other factors.

Wildlife Movement

No mitigation measures are recommended.

Regional and Local Policies/Plans

No mitigation measures are recommended.

Cumulative

No mitigation measures are recommended.

4.3.6 - Level of Significance After Mitigation

As part of the analysis of impacts to biological resources found on the project site, MBA contracted with Scott White Biological Consulting to conduct an inventory of sensitive plant communities and plant species occurring on-site. The Vegetation and Special Status Plants report prepared by Mr. White determined that both Pebble Plain and open Jeffrey Pine Forest habitats occur on-site and that these sensitive plant communities supported one federally listed plant species (ash-gray paintbrush) and four special status species. The report also characterized the plant community found along the shoreline as wet meadows. Small patches of wet meadow habitats were mixed with ruderal shoreline vegetation and were considered too small in size to actually map or to determine an acreage calculation. Recommendations were made to avoid the sensitive habitats, where feasible, and to mitigate off-site at 3:1 for direct impacts and 1:1 for indirect impacts if impacts couldn't be avoided. The report further indicated that there were numerous private land owners possessing off-site Pebble Plain and open Jeffrey Pine Forest habitats that could be purchased for mitigation.

In an effort to more adequately define impacts and to locate off-site properties for mitigation, Timothy Krantz, Ph.D., a noted authority on sensitive plant communities, with emphasis on Pebble Plain, open Jeffrey Pine Forest, and Wet Meadow habitats occurring within the Big Bear area, conducted a Focused Rare Plant Survey in 2008. 2008 was a year of normal precipitation. Dr. Krantz's Report reached the following conclusions:

- Although there are some scattered occurrences of indicator plant species, wet meadow habitat no longer occurs along the shoreline portion of the project site. This sensitive habitat has been replaced with mostly ruderal species and should be characterized as ruderal shoreline habitat.

- The 0.69 acre of Pebble Plain habitat can be successfully avoided and potential indirect impacts fully mitigated as part of the project design, through the creation of a 4.91-acre conservation easement (Lot A). No further mitigation would be required.

- Approximately 7.71 acres of occupied ash-gray Indian paintbrush habitat is present within the project site. Of these 7.71 acres of occupied habitat, 4.91 acres would be avoided through the creation of the 4.91-acre conservation easement on Lot A. Development of the Proposed Alternative Project would therefore only impact 2.8 acres of occupied habitat. Dr. Krantz (Krantz 2008; Appendix B) concurred that off-site compensation would be the preferred mitigation measure and identified a single parcel (10 acres) of Pebble Plain/open Jeffrey Pine Forest habitat that supports ash-gray paintbrush. This is the Dixie Lee Lane Pebble Plain Habitat that is characterized by Dr. Krantz as "high quality pebble plain" and has been fenced and protected since the mid 1980s. With preservation of the 10-acre Dixie Lane property, the project will have sufficient off-site mitigation at a 3:1 ratio to mitigate project impacts to ash-gray Indian paintbrush.

Implementation of these Mitigation Measures, including the implementation of on-site and off-site conservation of Pebble Plain Habitat, would reduce impacts to less than significant levels.

Significant and unavoidable impacts related to Biological Resources have been identified for impacts to bald eagle. If the County of San Bernardino approves the Proposed Alternative Project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA.

No additional significant impacts related to Biological Resources have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

4.4 - Hydrology and Water Quality

This section is based on the San Bernardino County Stormwater Program Model Water Quality Management Plan Guidance (June 2004); the 2005 Final Environmental Impact Report (EIR) prepared by RBF Consulting; the County of San Bernardino Hydrology and Hydraulics Preliminary Report prepared by AEI-CASC Engineering in October 2007; and the Tentative Tract 16136 Moon Camp – Post Construction Water Quality Findings, October 2007, prepared by AEI-CASC Engineering (Appendix C).

4.4.1 - Existing Conditions

Existing conditions are described in detail in the 2005 Final EIR. To date, these hydrological conditions have not changed. The drainage on the project site follows a natural pattern based on the topography of the site, which generally slopes in a north to south direction into Big Bear Lake. The project site is located within a 181-acre watershed. Some of the storm runoff flows across State Route 38 (SR-38) on the project site as sheet flow, some flows through a natural channel, and some runs through culverts, but the entire watershed flows south into the lake.

The project site elevation ranges from 6,747 feet at the lakeshore to 6,960 feet at the northeast corner. Slopes range from 5 percent to 40 percent and with generally southern exposure. Slopes become steeper farther north on the project site and are shallower near the waterline.

The upper slopes are composed of soil type D according to the San Bernardino County Hydrology Manual. Soil type D consists of clay soils and has a high runoff potential. The bottom half of the project site contains soils classified as type C. Soil type C consists primarily of silty-loam soils and has a slow infiltration rate.

The U.S. Army Corps of Engineers (USACE) has jurisdiction over a fraction of an acre of land in the project site because of its status as a perennial stream and they must have an opportunity to participate in the planning of this development. USACE also shares jurisdiction of the shoreline with California Department of Fish and Game (CDFG). Big Bear Lake is CDFG jurisdiction.

Watershed Characteristics

The 2005 Final EIR contains a detailed description of the watershed and its subareas.

Flood Control

According to the Flood Insurance Rate Map (FIRM) number 06071C7295 F, there is no existing flood hazard within the project site. The site is classified as flood zone D.

Groundwater

The following information is based on the 2005 Final EIR. Additional details may be found in the 2005 Final EIR and its appendices.

The project site overlies two groundwater aquifers, the North Shore Hydrologic Subunit and the Grout Creek Hydrologic Subunit. Both contain large independent surface water catchments. Most of the project site is located in a tributary aquifer of the North Shore Subunit designated as Subarea A. The northwest portion of the project site is located within tributary Subarea D of the Grout Creek Subunit. Both tributary subunits are groundwater sources and will supply the Proposed Alternative Project.

The baseline depth to groundwater in the North Shore Subunit is at 5 to 50 feet below surface depth. During the period 1996 to 2003, the groundwater level dropped approximately 20 feet in the North Shore Subunit. There are 40 private, homeowner, active wells currently extracting water from the Subarea A tributary aquifer. The average annual recharge for Subarea A has been estimated at between 14 and 44 acre feet.

The depth to groundwater in the Grout Creek Subunit is between 20 to 90 feet in the alluvium. Water is also found in fractures of the underlying bedrock. There are 29 private wells in this subunit. Groundwater levels have remained fairly stable during the study period. The average annual recharge for Subarea D of the Grout Creek Subunit has been estimated at between 32 and 99 acre feet.

Drainage and Groundwater Recharge

Impacts to surface water drainage would be significant if the Proposed Alternative Project changes the drainage patterns of the site and these changes cause erosion, siltation, increased runoff or flooding. Increase in the amount of runoff would be significant if it affects SR-38 or its storm drain culverts. Project design features and the Storm Water Pollution Prevention Program are presented with the Proposed Alternative Project to alleviate this possibility. They include the provision of adequate outlet structures, storm drains to contain flows, and proper hillside drainage. The Proposed Alternative Project incorporates appropriate redirection of flow and properly eliminates sheet flow across SR-38 through the introduction of check dams and storm culverts. All cross-culverts will be designed to handle the 100-year storm event.

Groundwater recharge is understood to occur during extended periods of rain and snow, and there is currently no supplementation or intentional recharging of the aquifers. The groundwater percolates into the alluvium and eventually flows into the sediments beneath Big Bear Lake. Most surface drainage goes directly into the lake; even though the site is currently pervious (except for the highway), the percolation rates are slow due to clay content in the soil. One goal of the San Bernardino County Stormwater Plan is to limit runoff from all project sites to 90 percent of the original amount.

Source: Hicks & Hartwick, Inc. (February 15, 2010).

NORTH

Not To Scale

Michael Brandman Associates

00520089 • 03/2010 | 4.4-1_Grout_Creek_Hydro.ai

Exhibit 4.4-1
Grout Creek Hydrologic Subunit: FP4 Well Site

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Water Supply

Refer to Section 4.9, Utilities, of this report for an extensive discussion of water supply for the Proposed Alternative Project. The Proposed Alternative Project's potential to substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level is also analyzed in Section 4.9, Utilities.

Surface Water Quality

Water quality is of fundamental concern. Because water is the universal solvent, it tends to contract pollution easily from the surroundings as it goes through its cycle. Chemicals of concern to the project location include dissolved solid waste, nitrogen fertilizers, organic pesticides, arsenic, other organic biocides and organic salts. The water from the two domestic water wells on the project site that would serve the Proposed Alternative Project was tested for standard pollutants (the third on-site well is a monitoring well). The results were of above average quality; only iron was above the national standard. Nearby wells have very low iron, so the result could be an anomaly.

According to the San Bernardino County Stormwater Program – Model Water Quality Management Plan (WQMP, 2004), the Proposed Alternative Project does require implementation of a WQMP because it proposes more than 10 residential units. Surface water quality in a developed area can have potentially detrimental effects on overall water quality and can limit the practical uses of receiving waters. The model program was developed to be incorporated into the conditions of approval during the permitting process of a project, and may also be referred to in the mitigation measures or incorporated into project design features. The effect is to minimize the transport of pollutants into bodies of water by limiting the impervious surfaces, slowing down the flow rate so water can better percolate into the earth (so sediments are deposited and/or not carried off), and capturing pollutants before they reach the receiving body of water.

Scoping Meeting Comments

The following questions and comments regarding hydrology were taken from the March 31, 2007, Public Meeting. The discussion was incorporated in to the text of this section as much as possible.

- Dredging in the lake to accommodate the marina.
- Address new urban runoff that would be associated with the Proposed Alternative Project.
- Big Bear Lake is currently an impaired body of water. The Revised Draft EIR must address urban runoff and lake water quality.
- Will runoff affect existing wells?

4.4.2 - Thresholds of Significance

The following criteria for establishing the significance of potential impacts on water resources were derived from Appendix G of the California Environmental Quality Act (CEQA) guidelines. A significant impact would occur if the Proposed Alternative Project would:

a) Violate any water quality standards or waste discharge requirements;

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;

f) Otherwise substantially degrade water quality;

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;

h) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; and

i) Result in inundation by seiche, tsunami, or mudflow.

4.4.3 - Project Impact Analysis

As a reference aid, the impact analysis for the Proposed Alternative Project has been categorized by subtopic.

Proposed Alternative Project Improvements

The mitigation measures in Section 4.4.6 specify Proposed Alternative Project improvements which would control and prevent stormwater damage and pollution by the Proposed Alternative Project. By following established guidelines for the management of runoff water, the Proposed Alternative Project would reduce runoff from the site to 90 percent of the current undeveloped rate. Therefore, there would be no additional runoff. Runoff that does occur would be filtered through a series of

engineered devices designed to remove pollutants. This strategy for controlling urban runoff meets County, State and federal standards.

Flood Control

According to the San Bernardino County General Plan EIR, Table IV-H-1, the project area is located in Flood Control District Zone 6, which is a low flood potential zone. This is due to the fact that the upstream watershed is relatively small and that runoff is incapable of producing floods with huge amounts of water. Nonetheless, stormwater culverts would be enlarged and fortified so that runoff would be conveyed under SR-38, thereby eliminating sheet flow.

Water Supply

Refer to Section 4.9, Utilities, of this Revised and Recirculated Draft EIR for an extensive discussion of water supply for the Proposed Alternative Project.

Surface Water Quality

Post-project runoff flows are proposed to generally remain in the existing natural drainage pattern, with culvert crossings occurring at low points along the highway and under interior roads, with ultimate discharge into Big Bear Lake. The Proposed Project Alternative will have a minor impact on the overall existing hydrology, effecting primarily minor redirection of natural flows, with the outfall into the lake remaining largely unchanged in both location and quantity. Proposed Alternative Project runoff flows will be carried to the lake via six proposed storm culverts, which drain directly into the lake itself; thus, runoff from the Proposed Alternative Project becomes a small part of the vast storage volume in Big Bear Lake.

The Proposed Project Alternative has been designed so that minor grading and minimal increases of impervious surfaces would occur on each lot by utilizing stemwall construction and a reduced overall construction footprint. Each lot will further reduce project runoff with the implementation of bioretention Best Management Practices (BMPs), while roads constructed as part of the Proposed Alternative Project will have runoff directed to bioretention areas. Big Bear Lake has a storage capacity of approximately 73,000 acre-feet. The project site is estimated to produce runoff equivalent to 0.04 percent of lake volume before development and 0.09 percent of lake volume after development. Thus, Proposed Alternative Project runoff is a miniscule fraction of lake storage.

Big Bear Lake possesses a controlled release point for project runoff flows at Big Bear Dam, which is controlled by Big Bear Municipal Water District (BBMWD). The primary goal of the BBMWD is maintaining the water level of Big Bear Lake at as high a level as possible given the availability of water and finances. The belief is that a constant water level increases recreational use, stabilizes property value, improves water quality and supports a healthier fish and wildlife environment.

BBMWD accomplishes their goal by implementing a water management plan that includes the following: [1]

- Stabilization of Big Bear Lake by managing the amount of water released to the downstream water rights holder;
- Watershed/water quality management;
- Recreation management; and
- Bear Valley Dam and Reservoir Maintenance.

In many seasons, BBMWD will elect to keep water in the lake and then purchase "in-lieu" water to meet demands of the downstream water rights holder. This "in-lieu" water is purchased from the San Bernardino Valley Municipal Water District and consists of water supplied via the State Water Project.

Releases from Big Bear Dam encounter another controlled release point further downstream at the Seven Oaks Dam, which is controlled by the USACE. The USACE operates Seven Oaks Dam in tandem with the Prado Dam, located 40.3 miles downstream on the Santa Ana River, by implementing the following strategies: [2]

- Runoff during the early flood season is stored behind Seven Oaks Dam to build a debris pool to protect outlet works;
- Small releases from Seven Oaks Dam are made on continual basis to maintain downstream water supply;
- During a flood, Seven Oaks Dam will store runoff for as long as the reservoir pool at Prado Dam is rising;
- After the flood threat has passed, Seven Oaks Dam will release stored water at a rate which does not exceed the downstream channel capacity; and
- After the flood season, Seven Oaks Dam will be gradually drained and the Santa Ana River will flow through unhindered.

BBMWD and the USACE's regulation of their structures is a function of irrigation demand, availability of water from other sources, and flood control purposes. Because these two organizations and their structures regulate and control discharges to downstream waters, and because runoff from the project site is miniscule compared to the volume stored in Big Bear Lake, Hydrologic Conditions of Concern (HCOC) for the Proposed Alternative Project development are independently minimal and not expected to directly and significantly impact down stream receiving waters.

[1] http://www.bbmwd.org/, Accessed Oct 1, 2007
[2] http://www.spl.usace.army.mil/resreg/htdocs/7oaks.html, Accessed Oct 1,2007

Project Receiving Waters

Big Bear Lake is the primary downstream receiving water for the project site. As project runoff flows continue westerly, further downstream receiving waters are the Santa Ana River, reaches 6 through 1, which ultimately drain to the Pacific Ocean. As Table 4-4-1 indicates, one or more of these receiving waters are impaired.

Table 4.4-1: Project Receiving Waters and Impairment

Storm Drains and Receiving Waters	Receiving Water Classification		Primary Hydro Unit Basin No.	303(d) Listing		TMDL Pollutants
	Proximate	Downstream		Listed?	Pollutant Causing Impairment	
Big Bear Lake	Yes	Yes	801.71	Yes	Copper, Mercury & Metals Source: **Resource Extraction** Noxious Aquatic Plants, Nutrients & Sedimentation/Siltation – Source: **Construction/Land Development, Snow skiing activities** PCBs (Polychlorinated biphenyls) -Source **Unknown**	Adopted Phosphorus
Santa Ana River (Reach 6)	No	Yes	801.72	No	None	None
Santa Ana River (Reach 5)	No	Yes	801.52	No	None	None
Santa Ana River (Reach 4)	No	Yes	801.25	Yes	Pathogens – Non Point Source	Not Adopted
Santa Ana River (Reach 3)	No	Yes	801.21	Yes	Pathogens – "Dairies"	Not Adopted
Prado Basin Management Zone	No	Yes	802.21	No	None	None
Santa Ana River (Reach 2)	No	Yes	801.11	No	None	None
Santa Ana River (Reach 1)	No	Yes	801.11	No	None	None
Pacific Ocean	No	Yes	801.11	No	None	None

Project Pollutants and Pollutants of Concern

Table 4.4-2 lists the pollutants likely to be associated with the development of the Proposed Alternative Project and compares these pollutants to pollutants causing stress in local receiving waters. When a project pollutant is the same as a pollutant causing stress in the receiving waters, the San Bernardino County WQMP Guidance requires that project runoff be treated for said pollutants utilizing BMPs that are medium to high effectiveness. Pollutants of concern for the Moon Camp project are bacteria/virus, heavy metals, nutrients, and sediments, see Table 4.4-2.

Nutrients are of particular concern because a total maximum daily load (TMDL) for phosphorus has been adopted for Big Bear Lake. The current TMDL assigned to Big Bear Lake is 475 lbs per year for Urban Waste Load Allocation for phosphorus. For urban areas, compliance with this TMDL requires compliance with the Municipal Separate Storm Sewer System (MS4) Permit, which, in turn, requires implementation of BMPs, which treat pollutants of concern at a medium to high level of effectiveness.

Table 4.4-2: List of Project Pollutants

Land Use	Associated Project Pollutants		Is Pollutant 303(d) Listed and/or TMDL for Receiving Water
	Pollutants	Status	
Home Subdivisions of 10 units or more & Streets/Highways/Freeways	Bacteria/Virus	Expected	Yes
	Heavy Metals	Expected	Yes
	Nutrients	Expected	Yes
	Pesticides	Expected	No
	Organic Compounds	Expected	No
	Sediments	Expected	Yes
	Trash and Debris	Expected	No
	O_2 Demanding Substances	Expected	No
	Oil and Grease	Expected	No

Permit Regulations

WQMP Requirements

The Santa Ana Regional Water Quality Control Board Order Number R8-2002-0012, NPDES Permit No. CAS618036 (Permit) requires post-construction BMPs to be implemented for new development and significant redevelopment projects, for both private and public agencies. A WQMP is then used to guide the development and implementation of a program to minimize the detrimental effects of urbanization on the beneficial uses of receiving waters, including effects caused by increased

pollutants loads and changes in hydrology.[3] Under the permit's requirements, the Proposed Alternative Project will be required to comply with the WQMP guidance document by implementing the following:

- Incorporate and implement site design BMPs;
- Incorporate and implement all applicable source control BMPs;
- Incorporate or implement Treatment Control BMPs; and
- Utilize a combination of site design, source control and/or treatment control that addresses all identified pollutants and hydrologic conditions of concern.

TMDL Requirements

The Santa Ana Regional Water Quality Control Board Resolution No. R8-2006-0023, amending the Water Quality Control Plan for the Santa Ana River Basin to Incorporate a Nutrient TMDL for Dry Hydrological Conditions for Big Bear Lake, was approved by the Office of Administrative Law (OAL) on August 21, 2007. Under this resolution, it appears that the only TMDL implementation provision applicable to the Proposed Alternative Project is the item referring to the MS4 Stormwater Permit:

> **Implementation Task 3.1** - "Waste Discharge Requirements for the San Bernardino County Flood Control and Transportation District, the County of San Bernardino and the Incorporated Cities of San Bernardino County within the Santa Ana Region, Areawide Urban Runoff, NPDES No. CAS 618036 (Regional Board Order No. R8-2002- 0012). The current Order has provisions to address TMDL issues. In light of these provisions, revision of the Order may not be necessary to address TMDL requirements."

The deadline for the Regional Board's update to the MS4 permit is February 29, 2008; however, as noted in Implementation Task 3.1, changes to the MS4 permit may not be necessary to address TMDL issues.

The County of San Bernardino, in compliance with its MS4 permit, has adopted a program that requires new development projects, such as the Proposed Alternative Project, to prepare and implement a WQMP that includes a combination of site design, source control, and treatment control BMPs to reduce the discharge of pollutants and hydrologic conditions of concern resulting from the development. This Revised and Recirculated Draft EIR outlines the site design BMPs, source control BMPs, and treatment control BMPs to be implemented by the Proposed Alternative Project, with said controls to ultimately be documented in a project-specific WQMP. Therefore, by preparing and implementing a WQMP including the prescribed BMPs, the Proposed Alternative Project will be compliant with the County's requirements, and by extension, the MS4 permit and TMDL implementation plan.

[3] San Bernardino Stormwater Program – Model Water Quality Management Plan Guidance Document, June 2005

Project BMPs

In order to address the project POCs and to reduce the chance of pollutants entering Big Bear Lake, the Applicant will implement a treatment BMP that is effective for all POCs and also prepare a WQMP which shall incorporate the following:

Site Design

Lots in the Proposed Alternative Project are proposed to be low density with stem wall construction, thereby reducing the area of construction. This criterion in planning reduces the overall footprint of construction and minimizes the imperviousness of each lot. The Proposed Project Alternative also proposes to include 5.73 acres of dedicated open space.

Source Control

Activity restrictions and property owners' education are crucial to the Proposed Alternative Project's success at preserving water quality. The more informed each property owner is, the more likely they are to participate in compliance with imposed water quality standards. Conditions, Covenants & Restrictions (CC&Rs) shall be utilized in this Proposed Alternative Project to clearly spell out activities that are not beneficial to water quality and shall not be allowed on the project site. The CC&Rs will be implemented and maintained by the Proposed Alternative Project's Property Owner's Association (POA). Specific and detailed activity restrictions will be included in the Final WQMP. Activities to be restricted in the Final WQMP include, but are not limited to:

- Conducting any activity, improvement or construction that would in any way tamper with, interfere with, or alter the treatment BMP (bioretention) in a manner that renders them less effective; and
- Any activity that is not consistent with the San Bernardino County ordinances and State/Federal laws relating to land use, zoning, and housing and fire hazard abatement.

Treatment Control

Assuming a generous average house footprint of 3,500 square feet on a 43,560-square-foot lot, with an estimated driveway surface of 3,000 square feet, produces an impervious percentage of 15. Using this average 15 percent yields a water quality volume (V_0) of 1.56 acre-feet for all project lots. Calculating the water quality volume of street runoff at 90 percent yields a V_0 of 0.37 acre-feet. Therefore, the individual lot treatment BMPs shall be designed to address 1.56 acre-feet of total water quality volume, approximately 0.03 acre-feet per lot, while the street treatment BMPs shall address the remaining 0.37 acre-feet of the water quality volume.

As shown in Table 4.4-3, the combination of a biofilter and filtration will treat the project pollutants of concern at medium to high level of effectiveness. The Caltrans Treatment BMP Technology Report (April 2007) provides results of their full-scale pilot studies performed on various BMPs. The report shows that bioretention will effectively treat nutrients from the project, including nitrogen and phosphorus, at a medium level of effectiveness.

Table 4.4-3: BMPs Level of Treatment

Pollutant of Concern	Treatment Control BMP Categories	
	Biofilter	Filtration
Sediment/Turbidity	H/M	H/M
Nutrients	L	L/M
Organic Compounds	U	H/M
Trash & Debris	L	H/M
Oxygen Demanding Substances	L	H/M
Bacteria & Viruses	U	H/M
Oils & Grease	H/M	H/M
Pesticides (non-soil bound)	U	U
Metals	H/M	H

Bioretention is the selected treatment BMP for the Proposed Alternative Project and operates similar to that of a biofilter and filtration. The individual lot owners will each treat their water quality volume prior to discharging from the site. Property owners will be responsible for their own maintenance. The street runoff will also be treated with bioretention that is located in common areas or on open space lots, with maintenance by the POA.

Cumulative Impacts

It is possible that cumulative impacts to Big Bear Lake would occur as a result of this Proposed Alternative Project combined with other development in the region. According to the Santa Ana Regional Water Quality Control Board (SARWQCB-District 8), construction, land development, snow skiing activities, and unknown point sources are the culprits of pollutants such as sedimentation, siltation, excess nutrients, and exotic/noxious plants. As discussed earlier, Big Bear Lake is listed by the SWRCB as an impaired body of water. However, with implementation of mitigation listed in Section 4.4.6 (BMPs, SWPPP, NPDES), the Proposed Alternative Project's potential to cumulatively impact lake water quality would be reduced to less than significant. Furthermore, mitigation outlining protocol procedure for set limits on groundwater well extraction and a defined water supply agreement (alternative) between the Project Applicant, the DWP, and CSA 53C would reduce the Proposed Alternative Project's potential cumulative impact to groundwater supply to less than significant.

Summary of Impacts

Drainage

The Hydrology and Hydraulics Preliminary Report (October 2007) concludes that the proposed development of the Proposed Alternative Project would have a minor impact on the overall hydrology. The primary effects would be a result of redirection of hydrologic flows from their natural direction and the elimination of surface flow across the highway as sheet flow. Because there

is a considerable amount of siltation in the existing culverts under SR-38, the culvert crossings would need to be reworked. This siltation illustrates the tendency of the soils of the watershed to erode and deposit near the lake and the project area. If the Proposed Alternative Project is not revegetated, or if large parts of the watershed become denuded as a result of drought, fire, or for any circumstance, the result could be accelerated erosion in the project area. The Proposed Alternative Project design features are expected to be an improvement to the overall drainage of the site and its ability to handle drainage problems.

Marina

Compared to 105 boat slips initially proposed in the Original Proposed Project, the Proposed Alternative Project includes 55 boat slips. This would require no dredging, just the sinking of posts for support of the boat slip structure. Big Bear Lake is listed by the SWRCB as an impaired water body. Per The Clean Water Act, before the USACE can issue a permit for the marina/boat ramp/slip dock, the project Applicant must receive an individual Conditional Water Quality Certification. Therefore, compliance with this procedure would reduce the level of impact to less than significant.

4.4.4 - Standard Conditions and Uniform Codes

The County of San Bernardino follows State standards for water quality. During construction, projects will be required to obtain coverage under the State's General Permit for Construction Activities that is administered by the California Regional Water Quality Control Board (RWQCB). The Proposed Alternative Project will obtain coverage under the statewide National Pollutant Discharge Elimination System (NPDES) permit for construction activities, and develop and implement a Stormwater Pollution Prevention Program (SWPPP) to control erosion and protect water quality during the construction phase of the Proposed Alternative Project as well as operating under an approved WQMP.

At a minimum, the SWPPP would address the following items:

- **Erosion control.** Employ measures to prevent the movement of soil by wind or water during construction and may include watering, and physical barriers to the movement of soil particles.
- **Tracking of Soil.** Employ measures to effectively minimize the tracking of soil by vehicles and may include gravel driveways, wheel washes and street sweeping.
- **Wastes and Cleanup.** The SWPPP must also address washout, cleanup and disposal related to debris, trash, concrete, asphalt, paint, coatings, solvents and other materials applicable to preparation and construction at the project site.

Other Reasonable BMPs. The SWPPP must also implement other applicable BMPS as needed to keep pollutants away from stormwater. The SWPPP must also identify additional applicable measures taken during the storm season and when storms are anticipated.

At a minimum, the WQMP would keep stormwater separate from potential pollutants and address the following items:

- **Parking Lot Runoff**. Parking lot drainage points should be equipped with oil/water separators which shall be maintained according to the manufacturer's requirements for maintenance.
- **Material Storage Area.** Any materials stored outdoors must be covered such that material cannot meet materials.
- **Other Reasonable BMPs.** WQMP and BMPs used on-site should be reviewed and revised as necessary to keep pollutants away from stormwater and the lake.

4.4.5 - Project Design Features

The 2005 Final EIR concluded that the 92 residential lot plan would cause significant adverse impacts to groundwater resources. This resulted in the Tract Map's revision by lowering lot quantity to 50 residential units in order to alleviate impacts to groundwater resources. An analysis of Water Supply impacts and associated mitigation measures is included in Section 4.9, Utilities. Mitigation measures incorporated in Sections 4.4.6 and 4.9.8 would reduce impacts to groundwater resources to a level of less than significant. Furthermore, the Proposed Alternative Project's proposal to construct several storm drain lines during development would mitigate by lowering on-site drainage impacts to a level of less than significant.

4.4.6 - Mitigation Measures

The following is a list of mitigation measures organized into categories. These mitigation measures are to be applied to the Proposed Alternative Project along with the SWPPP and WQMP.

Flood Control/Drainage Channels

HYD-1 Prior to issuance of a building permit, a program satisfactory to the County will be formulated to handle storm drain waters adequately.

HYD-2 All required drainage improvements must be designed and constructed to County standards. Tentative tract map, site plan, and other precise plans for individual lots will be accompanied by adequate plans for drainage improvements prepared by registered professional engineers.

HYD-3 The proposed cross culverts shall be sized for 100-year burn and bulking flow rates. The burn and bulking method would increase the runoff from the natural areas. The method provided in the Los Angeles County Hydrology Manual is recommended. In addition, the cross culverts shall all be designed with headwalls to prevent CMP crushing, and shall be maintained adequately.

Water Quality

Construction Impacts

HYD-4 To mitigate sediment transport during construction, the developer shall submit a sedimentation control plan with the grading plan for review and approval by the Public Works Department. The Project engineer shall certify compliance.

HYD-5 Prior to Grading Permit issuance and as part of the Proposed Alternative Project's compliance with the NPDES requirements, a Notice of Intent (NOI) shall be prepared and submitted to the SARWQCB providing notification and intent to comply with the State of California general permit. Also, a SWPPP shall be completed for the construction activities on-site. A copy of the SWPPP shall be available and implemented at the construction-site at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction-site to the "maximum extent practicable."

HYD-6 At a minimum, the following shall be implemented from the California Storm Water Best Management Practice Handbook - Construction Activity:

- Dewatering Operations – This operation requires the use of sediment controls to prevent or reduce the discharge of pollutants to storm water from dewatering operations.
- Paving Operations – Prevent or reduce the runoff of pollutants from paving operations by proper storage of materials, protecting storm drain facilities during construction, and training employees.
- Structural Construction and Painting – Keep site and area clean and orderly, use erosion control, use proper storage facilities, use safe products and train employees to prevent and reduce pollutant discharge to storm water facilities from construction and painting.
- Material Delivery and Storage – Minimize the storage of hazardous materials on-site. If stored on-site, keep in designated areas, install secondary containment, conduct regular inspections and train employees.
- Material Use – Prevent and reduce the discharge of pesticides, herbicides, fertilizers, detergents, plaster, petroleum products and other hazardous materials from entering the storm water.
- Solid Waste Management – This BMP describes the requirements to properly design and maintain trash storage areas. The primary design feature requires the storage of trash in covered areas.
- Hazardous Waste Management – This BMP describes the requirements to properly design and maintain waste areas.

- Concrete Waste Management – Prevent and reduce pollutant discharge to storm water from concrete waste by performing on and off-site washouts in designated areas and training employees and consultants.
- Sanitary Septic Water Management – Provide convenient, well-maintained facilities, and arrange regular service and disposal of sanitary waste.
- Vehicle and Equipment Cleaning – Use off-site facilities or wash in designated areas to reduce pollutant discharge into the storm drain facilities.
- Vehicle and Equipment Fueling – Use off-site facilities or designated areas with enclosures or coverings to reduce pollutant discharge into the storm drain facilities.
- Vehicle and Equipment Maintenance – Use off-site facilities or designated areas with enclosing or coverings to reduce pollutant discharge into the storm drain facilities. In addition, run a "dry site" to prevent pollution discharge into storm drains.
- Employee and Subcontractor Training – Have a training session for employees and subcontractors to understand the need for implementation and usage of BMPs.
- Preservation of Existing Vegetation – Minimize the removal of existing trees and shrubs since they serve as erosion control.
- Seeding and Planting – Provide soil stability by planting and seeding grasses, trees, shrubs, vines, and ground cover.
- Mulching – Stabilize cleared or freshly seeded areas with mulch.
- Geotextiles and Mats – Natural or synthetics material can be used for soil stability.
- Dust Control – Reduce wind erosion and dust generated by construction activities by using dust control measures.
- Construction Road Stabilization – All on-site vehicle transport routes shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust.
- Stabilized Construction Entrance – Stabilize the entrance pad to the construction area to reduce amount of sediment tracked off-site.
- Earth Dikes – Construct earth dikes of compacted soil to divert runoff or channel water to a desired location.
- Temporary Drains and Swales – Use temporary drains and swales to divert off-site runoff around the construction-site and stabilized areas and to direct it into sediment basins or traps.
- Outlet Protection – Use rock or grouted rock at outlet pipes to prevent scouring of soil caused by high velocities.

- Check Dams – Use check dams to reduce velocities of concentrated flows, thereby reducing erosion and promoting sedimentation behind the dams. Check dams are small and placed across swales and drainage ditches.
- Silt Fence – Composed of filter fabric, these are entrenched, attached to support poles, and sometimes backed by wire fence support. Silt fences promote sedimentation behind the fence of sediment-laden water.
- Straw Bale Barrier – Place straw bales end to end in a level contour in a shallow trench and stake them in place. The bales detain runoff and promote sedimentation.
- Sand Bag Barriers – By stacking sand bags on a level contour, a barrier is created to detain sediment-laden water. The barrier promotes sedimentation.
- Brush or Rock Filter – Made of 0.75 to 3-inch diameter rocks placed on a level contour or composed of brush wrapped in filter cloth and staked to the toe of the slope provides a sediment trap.
- Storm Drain Inlet Protection – Devices that remove sediment from sediment laden storm water before entering the storm drain inlet or catch basin.
- Sediment Trap – A sediment trap is a small, excavated, or bermed area where runoff for small drainage areas can pass through allowing sediment to settle out.

Long-Term Operational Impacts

HYD-7 A water quality maintenance program will be implemented to mitigate the impact of Proposed Alternative Project generated runoff on surface water quality over the long term. The program outlined in Water Pollution Aspects of Street Surface Contaminants (prepared by the United States Environmental Protection Agency) provides recommendations for street cleaning and prevention of pollution generation.

- Prior to Grading Permit issuance, a WQMP shall be developed and shall include both Non-Structural and Source Control BMPs. The WQMP shall conform to the San Bernardino County Draft NPDES permit and WQMP standards. The following are the minimum required controls to be implemented as a part of the WQMP for Urban Runoff.
- Education for Property Owners, Tenants and Occupations – The Property Owners Association is required to provide awareness educational material, including information provided by San Bernardino County. The materials shall include a description of chemicals that should be limited to the property and proper disposal, including prohibition of hosing waste directly to gutters, catch basins, storm drains or the lake.
- Activity Restrictions – The developer shall prepare conditions, covenants and restriction of the protection of surface water quality.

- Common Area Landscape Management – For the common landscape areas on-going maintenance shall occur consistent with County Administrative Design Guidelines or city equivalent, plus fertilizer and pesticide usage consistent with the instructions contained on product labels and with regulation administered by the State Department of Pesticide Regulation or county equivalent.
- Common Area Catch Basin Inspection – Property Owners Associations shall have privately owned catch basins cleaned and maintained, as needed. These are intended to prevent sediment, garden waste, trash and other pollutants from entering the public streets and storm drain systems.
- Common Area Litter Control – POAs shall be required to implement trash management and litter control procedures to minimize pollution to drainage waters.
- Street Sweeping Private Streets and Parking Lots – Streets and Parking lots shall be swept as needed, to prevent sediment, garden waste, trash and other pollutants from entering public streets and storm drain systems.

HYD-8 The following controls from the California Storm Water BMP Handbook - Municipal shall be employed:

- Housekeeping Practices – This entails practices such as cleaning up spills, proper disposal of certain substances and wise application of chemicals.
- Used Oil Recycling – May apply to maintenance and security vehicles.
- Vegetation Controls – Vegetation control typically includes chemical (herbicide) application and mechanical methods. Chemical methods are discussed in SC10. Mechanical methods include leaving existing vegetation; cutting less frequently, hand cutting, planting low maintenance vegetation, collecting and properly disposing of clippings and cuttings, and educating employees and the public.
- Storm Drain Flushing – Although general storm drain gradients are sufficiently steep for self-cleansing, visual inspection may reveal a buildup of sediment and other pollutants at the inlets or outlets, in which case flushing may be advisable.

HYD-9 The WQMP shall include Structural or Treatment BMPs. The structural BMPs utilized shall focus on meeting potential TMDL requirements for noxious aquatic plants, nutrients, sedimentation and siltation. The structural BMPs shall conform to the San Bernardino County NPDES permit and the San Bernardino WQMP standards.

HYD-10 Consistent with the WQMP guidelines contained in the Draft NPDES Permit and Waste Discharge Requirements for San Bernardino County, Structural BMPs shall be required for the Proposed Alternative Project. They shall be sized to comply with

one of the following numeric sizing criteria or be considered by the Permitees to provide equivalent or better treatment. Volume-based BMPs shall be designed to infiltrate or treat either:

- The volume of runoff produced from the 85th percentile 24-hour storm event, as determined from the local historical rainfall record; or
- The volume of the annual runoff produced by the 85th percentile 24- hours rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or
- The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practice Handbook – Industrial/Commercial (1993); or
- The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event.

- OR -

- Flow-based BMPs shall be designed to infiltrate or treat either:
- The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or
- The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or
- The maximum flow rate of runoff, as determined from the local historical rainfall record that achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

HYD-11 The following are the minimum required controls to be implemented as a part of the WQMP for Urban Runoff.

- Control of Impervious Runoff – Surface runoff shall be directed to landscaped areas or pervious areas.
- Common Area Efficient Irrigation – Physical implementation of the landscape plan consistent with County Administrative Design Guidelines or city equivalent, which may include provision of water sensors, programmable irrigation timers, etc.
- Common Area Runoff-Minimizing Landscape Design – Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration.

- Catch Basin Stenciling – "No Dumping – Flows to Lake" or equivalent effective phrase shall be stenciled on catch basins to alert the public as to the destination of pollutant discharging into storm drain.
- Debris Posts – These shall be installed to prevent large floatable debris from entering the storm drains. They shall be placed upstream of the cross culverts.
- Inlet Trash Racks – These shall be installed where appropriate to reduce intake and transport through the storm drain system of large floatable debris. Trash racks shall be provided where drainage from open areas enters storm drain or cross culverts.

HYD-12 Storm water treatment under the NPDES Permit and the future TMDL requirements shall include the construction of treatment BMPs.

HYD-13 Treatment BMPs appropriate for on-site use shall include infiltration trenches and basins, swales, inlet filtration, and/or water quality basins.

HYD-14 All storm water runoff shall be treated before leaving the site to reduce pollutants in Big Bear Lake.

Infiltration Trenches and Basins

HYD-15 Infiltration trenches and/or basins shall be used on site to meet potential future TMDLs for noxious aquatic plants and nutrients. Infiltration trenches and basins treat storm water runoff through filtration. A typical infiltration trench is essentially an excavated trench, that is lined with filter fabric and backfilled with stones. Depth of the infiltration trench shall range from three to eight feet and shall be located in areas with permeable soils, and water table and bedrock depth situated well below the bottom of the trench. Trenches shall not be used to trap coarse sediments since large sediment would likely clog the trench. Grass buffers may be installed to capture sediment before it enters the trench to minimize clogging. Infiltration basins shall be used for drainage areas between 5 and 50 acres. Infiltration basins shall be either in-line or offline, and may treat different volumes such as the water quality volume or the 2-year or 10-year storm.

Swales

HYD-16 The Proposed Alternative Project shall implement either vegetative swales, enhanced vegetated swales utilizing check dams and wide depressions, a series of small detention facilities designed similarly to a dry detention basin, or a combination of these treatment methods into a treatment train (series of Structural BMPs). The Water Quality Management Plan shall address treatment for the Proposed Alternative Project to assure that runoff from the site is treated to the "maximum extent practicable." The swales shall be treated as water quality features and shall be maintained differently than grass areas. Specifically, pesticides, herbicide, and

fertilizers, which may be used on the grass areas, shall not be used in the vegetation swales.

Filtration

HYD- 17 Filtration shall be implemented as a treatment method and shall use drop-in infiltration devices or inline devices. Drop-infiltration devices at all curb inlets within the internal parking lots shall be implemented to provide potential pollutant removal. Existing examples of these filtration devices include the Drain Pac Storm Drain Inserts and Fossil Filters. These types of devices are efficient at removing oil and grease, debris, and suspended solids from treated waters. Some of these devices have also exhibited high efficiencies at removing heavy metals and other pollutants. Inline devices suggested for use onsite include the Continuous Deflection Separator (CDS unit). Once the runoff has entered the storm drain, an in-line diversion would direct the treatment flow to a CDS unit. The CDS unit is a non-blocking, non-mechanical screening system, which would provide a second line of defense for solids removal. Adsorption materials can be added within the CDS unit to aid in the removal of oil and grease. The treated flow would then exit the CDS unit and continue downstream. Monitoring of filtration devices shall be conducted. The use of street sweeps on the parking lots and streets shall aid in reducing the amounts of sediment and debris that flow through the devices. This would extend the effectiveness of the devices during a storm event and would lower the frequency of required maintenance. The devices shall be checked and cleaned, if necessary, once a month during the rainy season, following any precipitation and at the end of the dry season prior to the first precipitation event of the rainy season. Consideration shall be given to using these filtration units in other areas besides the parking lot inlets. Another potential location is at the downstream end of the tributary pipes that feed the discharge point. Siting these units at a downstream point would allow for the treatment of a greater amount of runoff.

Jurisdictional Waters

HYD-18 The Developer shall comply with any requirements of the U.S. Army Corps of Engineers (ACOE) and the California Department of Fish and Game (CDFG) regarding water quality and drainage.

HYD- 19 Any well located on the site of the Proposed Alternative Project, if not used as a water supply well or a monitoring well, shall be capped and taken out of service in accordance with accepted civil engineering standards.

Level of Significance After Mitigation

No significant impacts related to hydrology and water quality have been identified for the Proposed Alternative Project following implementation of the recommended mitigation measures and through regulatory compliance.

4.5 - Land Use

The purpose of this section is to identify existing land use conditions on the project site and in the vicinity and to evaluate the potential environmental impacts associated with the proposed General Plan Amendment to redesignate the project site from its current designation of Rural Living – 40 (RL-40) (minimum 40-acre lot size), which would allow one dwelling unit on-site, to Single Family Residential with 20,000-square-foot minimum lot sizes (RS-20M).

The 2005 Final Environmental Impact Report (EIR) evaluated the Original Proposed Project, which was a Tentative Tract Map for a 95-lot subdivision consisting of 92 residential lots and three lettered lots (for private streets) and a General Plan Amendment to redesignate the site from RL-40 to Single Family Residential (RS) with minimum 7,200-square-foot lots. Potential impacts associated with Original Proposed Project were thoroughly evaluated in Section 5.1 of the 2005 Final EIR. The conclusion of the 2005 Final EIR was that the Original Proposed Project was designed to be compatible with the surrounding land uses because:

- Implementation of the Original Proposed Project would be considered an extension of the existing land use pattern (i.e., surrounding single-family residential uses with a minimum lot size of 7,200 square feet) and offered the opportunity for a cohesively planned development that would be subject to compliance with the County's administrative design guidelines and development standards specific to the RS District.
- The Original Proposed Project was consistent with the relevant Land Use Element goals and policies for the RS District and the proposed single family residential development was considered to be a reasonable extension of the existing land use patterns (7,200-square-foot lots) of the adjacent developed neighborhoods.
- The proposed Land Use District Change would not have a substantial adverse effect on surrounding properties following compliance with the County's established development standards, design guidelines, and the mitigation measures identified in the 2005 Final EIR that relate to land use compatibility, such as aesthetics and noise.

The analysis presented herein is specifically related to the Proposed Alternative Project consisting of 57 lots (50 residential lots and seven lettered lots for Open/Space and Conservation, Neighborhood Lake Access, three well sites, a potential reservoir site, and in the case of Lot C, the parking lot for the proposed marina). This section also addresses the Applicant's intent to address issues raised concerning land use compatibility in comments received on the 2005 Final EIR, as well as comments raised in a Public Meeting held for local residents on March 31, 2007.

NOTE: Please be aware that this is explaining the difference of how the 'application' will be handled vs. the EIR):

"County Development Code Section 81.01.090 determines how the General Plan and the requirements of the Development Code will apply to a development project that is in progress at the time the General Plan or Development Code goes into effect. Development Code Section 81.01.090 provides that applications accepted as complete prior to April 12, 2007 (the effective date of the General Plan) "shall be processed in compliance with the regulations and requirements in effect at the time the application was accepted as complete." Because the County accepted the Mooncamp application as complete prior to April 12, 2007, the Mooncamp application is to be considered under the prior version of the General Plan and Development code analyzed in the 2004 Draft EIR.

CEQA requires the lead agency to examine "whether the proposed project would be consistent with existing zoning, plans and other applicable land use controls" (CEQA Guideline Section 15063 (d)(5)). In accordance with County staff direction, the Re-circulated Draft EIR complies with this requirement by providing evaluation of the original project's consistency with the updated General Plan and Development Code and the proposed project's consistency with the updated General Plan and Development Code land use designations that are applicable to the area surrounding the Project site. The potential significant impacts related to land use identified in the 2004 Draft EIR are the same as those discussed in the Re-circulated Draft EIR. However, subsequent to the 2004 Draft EIR, the proposed project was revised and a comparison of the Original Proposed Project and the Proposed Alternative Project is located in Table ES 4.5-1, below.

Table ES-4.5-1: Comparison - Original Proposed Project and Proposed Alternative Project

	Original Proposed Project	Proposed Alternative Project	Change
Site Size	62.43 acres	62.43 acres	No change
Proposed General Plan Designation*	BV/RS-1 (residential- minimum 7,200 sf lots)	BV/RS-20M (residential- minimum 20,000 sf lots)	Approx. 6 du/ac to approx 2 du/ac
Number of Lots	95	57	- 38
Residential Lots	92	50	- 42
Lettered Lots	3	7	+ 4
	Lot A – proposed private street designed to provide access to the southernmost lots (lakefront sites)	Lot A – a 4.91-acre Open Space/Conservation (OS/C) easement to preserve pebble plain habitat and eagle perch trees	4.91 acres of Open Space for habitat conservation and eagle perch trees
	Lot B – a 1.4-acre strip of land between State Route 38 and the private street south of the highway	Lot B – a 0.82 acre/891 lineal feet strip of land to remain OS/C between State Route 38 and the lakefront for open space and Neighborhood Lake Access	0.82 acre/891 lineal feet of Open Space for preservation of lake views, eagle perch trees and Neighborhood Lake Access
	Lot C – a gated entrance, south of State Route 38, a parking lot and access to the marina	Lot C – a 2.90-acre strip of land to be used as a parking lot and boat launch and open space	Open space, eagle perch trees and lake views are maintained

Table ES-4.5 1(cont.): Comparison - Original Proposed Project and Proposed Alternative Project

	Original Proposed Project	Proposed Alternative Project	Change
		Lots D, E and F – well sites	
		Lot G – reservoir site	Potential reservoir site
Common Areas	Common areas within lettered lots would be maintained by a homeowner's association	Conservation Easements would be maintained by a Conservation Group and Common areas within lettered lots would be maintained by a homeowner's association	A Conservation Group would maintain the Conservation Easements
Marina/Boat Dock	103 boat slips on west side of the site	55 boat slips on the east side of the site	- 48 and relocation
Lakefront Lots	31 lakefront lots	No lakefront lots	- 31 lakefront lots
State Route 38	Realignment of State Route 38 to provide a straighter alignment and to provided lakefront residential lots	No change in the alignment of State Route 38	No realignment No lakefront lots
Development Scenario	Lots would be sold individually and custom homes would be constructed by the individual property owners	Lots would be sold individually and custom homes would be constructed by the individual property owners	No change
* Current General Plan Designation is BV/RL-40 – Bear Valley Community Plan, Rural Living, minimum 40-acre residential lot size.			

4.5.1 - Existing Conditions

The project site consists of approximately 62.43 acres of undeveloped land located along the north shore of Big Bear Lake, in the unincorporated community of Fawnskin. Exhibit 2-2, in Section 2, Project Description, is an aerial photograph showing existing conditions in the vicinity of the project site. The property is adjacent to the boundaries of the San Bernardino National Forest; however, the Proposed Alternative Project requires no US Forest Service (USFS) permitting. State Route 38 (North Shore Drive/SR-38) traverses the southern portion of the property near the lakeshore.

Exhibit 4.5-1 shows the Land Use designations for the project site and vicinity. There are a number of local, State and federal agencies that have jurisdiction or permitting authority over construction and/or post-construction conditions of the Proposed Alternative Project. These agencies are listed in Section 2.5 of the Project Description and include the US Army Corps of Engineers (USACE) and State Regional Water Quality Control Board (RWQCB) with jurisdiction over waters of the United States (U.S.) (stormwater runoff into the lake).

The project site is currently undeveloped and is designated by the County of San Bernardino as being within the Bear Valley Community Plan (BV), Rural Living with minimum 40-acre lots (BV/RL-40). This means that under current conditions, the Applicant is allowed to develop one dwelling per 40 acres. Table 4.5-2 shows the Existing Land Use and Land Use Designations for the Proposed

Alternative Project site and surrounding properties. For the project site, the designation of RL-40 indicates that future development proposals will be considered based upon a demonstrated ability to provide adequate infrastructure and maintain consistency with the goals and policies of the Community Plan.

Table ES-4.5-2: Existing Land Use and Land Use Designations

Location	Existing Land Use	Community Plan Land Use District	Allowed Uses
Project Site	Vacant	Rural Living (BV/RL-40)	Minimum parcel size is 40 acres; one dwelling unit per parcel. Provides sites for rural residential uses, incidental agricultural uses, and similar and compatible uses. This is considered a holding zone designation in the Bear Valley Community Plan, which indicates that future General Plan amendments will be considered where specific development proposals demonstrate an ability to provide adequate infrastructure to serve the development and maintain consistency with the goals and policies of the Bear Valley Community Plan.
Northwest	Residential	Residential (BV/RS)	Allows four dwelling units per acre, minimum lot size is 7,200 square feet. Provides sites for single-family residential uses, incidental agricultural and recreational uses, and similar and compatible uses.
North	Vacant	Rural Living (BV/RL-10)	Minimum parcel size is 10 acres; one dwelling unit per parcel. Provides sites for single-family residential uses, incidental agricultural and recreational uses, and similar and compatible uses. Future development proposals within the RL-10 designation will be considered based on a demonstrated ability to provide adequate infrastructure and maintain consistency with the goals and policies of the 2006 Community Plan.
Northeast	Vacant and Forest (U.S. Forest Service)	Resource Conservation (RC)	Allows one unit per 40 acres, with a minimum district size of 200 acres. Provides sites for open space and recreational activities, single-family homes on very large parcels, and similar and compatible uses. This is U.S. Forest Service administered land.
East	Vacant and Forest (U.S. Forest Service)	Resource Conservation (RC)	Allows one unit per 40 acres, with a minimum district size of 200 acres. Provides sites for open space and recreational activities, single-family homes on very large parcels, and similar and compatible uses. This is U.S. Forest Service administered land.

Table ES-4.5 2 (cont.): Existing Land Use and Land Use Designations

Location	Existing Land Use	Community Plan Land Use District	Allowed Uses
Southeast	Residential	Residential (BV/RS)	Allows four dwelling units per acre, minimum lot size is 7,200 square feet. Provides sites for single-family residential uses, incidental agricultural and recreational uses, and similar and compatible uses.
South	Big Bear Lake, Residential (SE)	Floodway (FW).	Uses permitted at owners risk; minimum parcel size is 10 acres. Provides sites for animal keeping, grazing, crop production, and similar and compatible uses.
West	Vacant, and Residential	Special Development (BV/SD-RES)	Provides sites for a combination of residential, commercial, industrial, agricultural, open space and recreation uses, and similar and compatible uses.
		Single Residential (BV/RS)	4 dwelling units per acre, minimum lot size is 7,200 square feet. Provides sites for single-family residential uses, incidental agricultural and recreational uses, and similar and compatible uses.
Source: Bear Valley Community Plan, 2007.			

Comments from the March 31, 2007 Public Meeting

The following are public comments received during the March 31, 2007, Public Meeting related to Land Use and Land Use Compatibility:

- Address how 50 new homes will contribute to increased ambient noise and light in the vicinity and address the difference between owner occupied homes and rental homes (see Section 4.6, Noise, for a discussion of this issue).
- EIR needs to evaluate open space/land use compatibility.
- Address the proposed location of the marina and impacts to surrounding properties from light, noise, trash, and other issues.
- Will the project be evaluated under the existing general plan or the new general plan?
- Will there be restrictions on building footprints?
- Will the building footprint and heights affect/impact views from existing neighboring homes?
- What are the effects on existing property values in the neighborhood?

- Address project traffic on existing roads. Does the project trigger the need for turning lanes into existing streets? Particularly at Canyon Road and Highway 18. Residents do not want a traffic signal.
- Will bikeway go through the existing neighborhood?
- Address General Plan policies relative to 'fire hazards' and 'open space.'

4.5.2 - Thresholds of Significance

California Environmental Quality Act (CEQA) Guidelines

According to Appendix G of the CEQA Guidelines, a project would have significant land use impacts if it would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the proposed project (including, but not limited to the General Plan, Specific Plan, local coastal program, or zoning ordinance) adopted for the purpose of mitigating an environmental effect;
- Conflict with adopted environmental plans and goals of the community where it is located;
- Conflict with established recreational, educational, religious, or scientific uses of the area; and/or
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

Bear Valley Community Plan

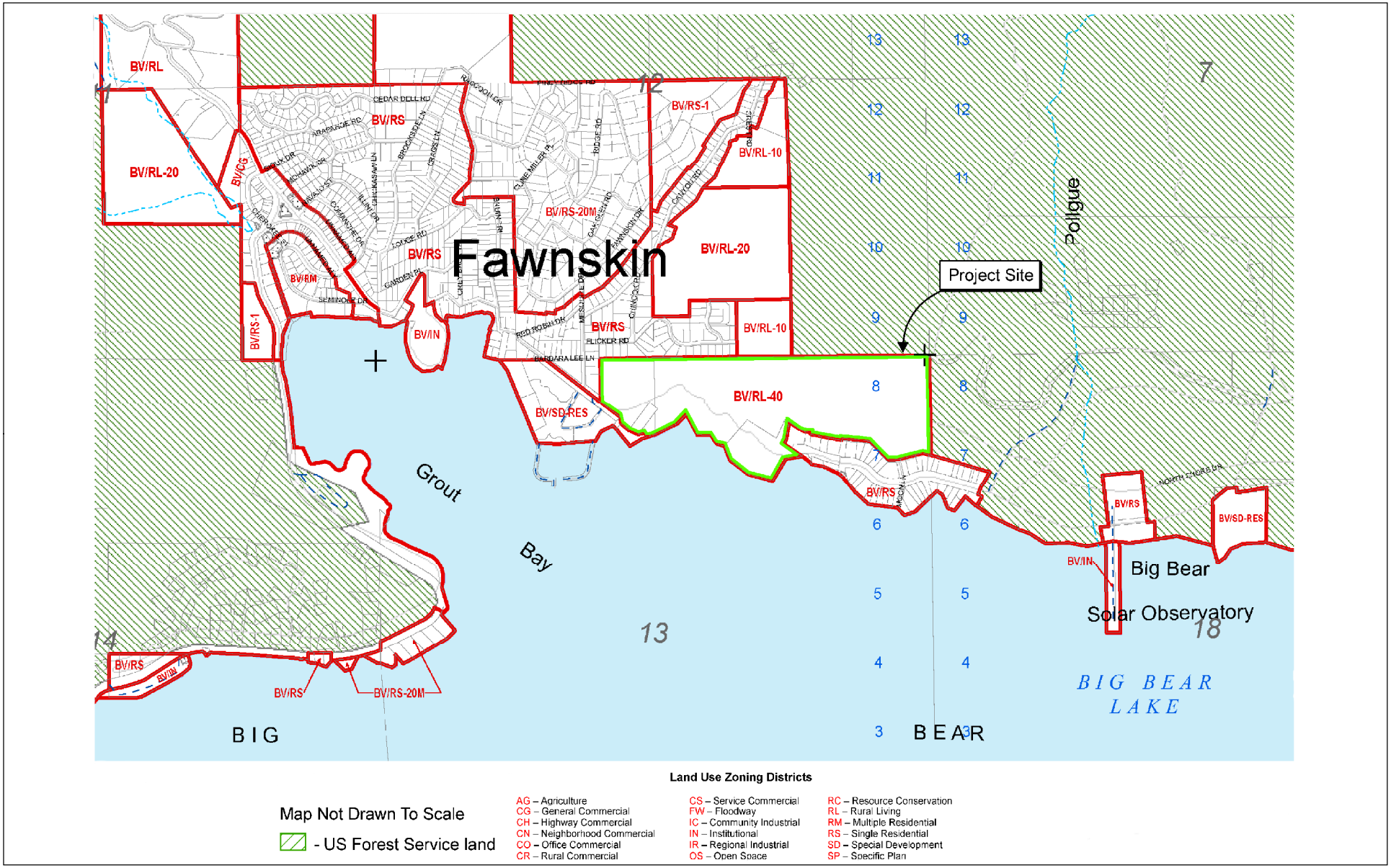
According to the Bear Valley Community Plan, a proposed project would have significant land use impacts if it would:

- Be inconsistent with the predetermined General Plan land use policy for the area;
- Be incompatible with the surrounding areas; or
- Be inconsistent with the community character.

National Environmental Policy Act

According to the National Endangered Policy Act (NEPA), a project would have significant land use impact if it would:

- Violate standards of any federal agency with jurisdiction in the project area or the surrounding area, such as the Environmental Protection Agency (EPA) or US Forest Service (USFS). The standards of these agencies should be based on the direct, indirect and cumulative impacts to ecological, aesthetic, cultural, economic, and social or health resources.



Source: San Bernardino County Land Use Plan GENERAL PLAN (2007).

Michael Brandman Associates

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Exhibit 4.5-1
County of San Bernardino Existing Land Use Designations

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

NEPA requires federal agencies to consider impacts of their actions on the human environment where the action is funded or permitted by a federal agency. The USFS does not have direct jurisdiction over the project site since it is privately owned; however, USFS administered land is adjacent to the project site and the USFS is funded to implement fire safety programs. Currently, fire conditions in the area are hazardous due to drought conditions and the stress on trees due to both the drought and the bark beetle infestation. Habitat modification is part of the management of forested lands designed to control fire hazard.

The USACE is another responsible agency with jurisdiction in the project area due to the proximity of the project site to Big Bear Lake. The Waterways of the U.S., which USACE presides over, include drainage channels and seasonal creeks which flow into the lake. The local drainage pattern conveys stormwater into the lake from the project site and other adjacent sites. For a comprehensive discussion of drainage issues please see Section 4.4, Biological Resources, of this Revised and Recirculated Draft EIR.

4.5.3 - Project Impact Analysis

As summarized above, the 2005 Final EIR analysis concluded that the Original Proposed Project (92 residential lots and three lettered lots for private streets) would be consistent with the planning and land use goals and policies of the County of San Bernardino for the Single Family Residential District, which is the designation for the adjacent neighborhoods to the northwest and southeast (see Exhibit 4.5-1). The 2005 Final EIR adequately addressed all the related planning issues and provided thorough reference information regarding policy in the area of Land Use including details of County policies, overlay districts, responsible agencies involved in Land Use Planning, etc. The issue of land use compatibility, particularly related to the density and intensity of the Original Proposed Project, was raised in both the comments received on the 2005 Final EIR and in the public meeting held on March 31, 2007.

There are tangible differences regarding land use and policy between the Original Proposed Project and the Proposed Alternative Project that address the issue of land use compatibility. The following is a list of revisions that have been made to the Proposed Alternative Project in order to reduce the density and intensity of the proposed land use as compared to the Original Proposed Project (Exhibit 2-4) and reduce impacts on land use compatibility. The Proposed Alternative Project (Exhibit 2-5) differs from the Original Proposed Project as follows:

- A reduction in the density and intensity of the Proposed Alternative Project from a designation of BV/RS (minimum 7,200-square-foot lots) to a designation of BV/RS-20M (minimum 20,000-square-foot lots), and reducing the number of residential lots from 92 to 50;
- While the Proposed Alternative Project has a minimum lot size of ½ acre, the average lot size is 0.90 acre, with 12 of the 50 lots being in excess of 1 acre.

- The Original Proposed Project included 31 lakefront lots located between SR-38 and the lakeshore. The Proposed Alternative Project has no lakefront lots;
- The relocation of the marina and a reduction in the number of boat slips from 103 to 55 commensurate with the reduction in the number of residential lots;
- The set aside of approximately 6 acres of the site for Open/Space, Conservation and Neighborhood Lake Access easements in two lettered lots, plus another lettered lot designated for the marina parking lot, but having Open Space value with existing perch trees that would remain in place. These areas are located adjacent to SR-38, so the Open Space component of the Proposed Alternative Project would reduce the overall intensity of use by limiting the number of residential lots that abut SR-38 to nine lots – no lots have direct access onto SR-38, but access the interior streets. In addition, a 10-acre offsite pebble plain habitat would be purchased and dedicated as a Conservation Easement;
- The reduction in the number of lots and the elimination of residential lots along the shoreline results in a reduction in the number of trees that would likely have been removed to accommodate an additional 42 houses as proposed in the Original Proposed Project;
- The deletion of the proposed realignment of a segment of SR-38 and therefore retaining up to 665 trees that would have been removed to create the realignment;
- The use of the property's shoreline as Open Space and Neighborhood Lake Access rather than as lakefront residential lots and the limitation of residential lots along SR-38 to nine would buffer and greatly reduce the impacts to public views from the lake or from the south shore of the lake;
- The reduction in the number of access points onto SR-38 from the south side of the site from five to two, with the two proposed being limited to residents using the marina parking lot; and
- The elimination of an access point from Moon Lane for public use, limiting the use of the road north of SR-38 for emergency vehicles only.

The following information will suffice to analyze the Proposed Alternative Project's relative compliance with the thresholds of significance established by CEQA, the County of San Bernardino, the Bear Valley Community, and the USFS, as well as other responsible agencies.

Physically Divide a Community

The Original Proposed Project and the Proposed Alternative Project do not physically divide a community. Although the Proposed Alternative Project includes a change in land use designation to allow increased density from RL-40 to RS-20M, the resulting neighborhood will be less dense than development in adjacent neighborhoods in the Fawnskin community.

Conflict with Applicable Land Use Plans, Policies or Regulations of an Agency with Jurisdiction over the Proposed Project

US Forest Service

San Bernardino National Forest Land Use Management Plan

The San Bernardino National Forest Land Management Plan 2006 Revision identifies a zoning map system for managing the forest. It identifies a plan for conserving a calculated percentage of the forested land it manages for wildlife habitat. This management plan does not affect private land and there are no requirements to conserve additional habitat on the project site other than unique habitat or habitat where sensitive or endangered species are present. Because the project site does contain unique and sensitive habitat, provisions have been made in this Proposed Alternative Project to conserve this land. "Lot A Open Space and Conservation Easement" is shown on the Tentative Tract No. 16136 map, revised July 2009 (Exhibit 2-5). This easement incorporates the pebble plain habitat (see Section 4.3, Biological Resources, for a comprehensive discussion of this habitat). "Lot B" is also an "Open Space, Conservation and Neighborhood Lake Access Easement" incorporated into the Proposed Alternative Project. It covers the lake shoreline area containing willow flycatcher habitat. Six of the nine Bald Eagle perches identified in the biological assessment included in the 2005 Final EIR are contained within the two easements, and none of them are in the 100-foot fire break required on the lots adjacent to the USFS land (lots 14 through 26). A potential loss of habitat could result from the take of trees required for fire control for the Proposed Alternative Project, or as a result of the bark beetle infestation (not related to the Proposed Alternative Project). The loss of tree density could reduce habitat for San Bernardino flying squirrel in the fire break area. This issue is also discussed further in Section 4.3, Biological Resources.

The Forest Land Management Plan 2006 Revision identifies high scenic integrity objectives for the area surrounding the project site; therefore the Proposed Alternative Project has the potential to negatively impact scenic vistas. A reduction of the density and intensity of land use, specifically reducing the number of residential lots from 92 to 50, deleting the 31 proposed residential lots from the shoreline and the realignment of a segment of SR-38, and the establishment of conservation easements on-site, in addition to mitigation measures identified in Sections 4.1, Aesthetics, and 4.3, Biological Resources, would adequately address the potentially significant impacts to land uses that rely on scenic resources. When compared to the Original Proposed Project, the Proposed Alternative Project has significantly reduced the visual impacts associated with site development.

Wildfires

Wildfire is the primary safety issue in the mountain area. Any residential or commercial land use could be impacted by a wildfire in the area. Implementation of the San Bernardino National Forest Plan for mechanical thinning of understory trees and provision of a dedicated water reservoir for fire-flow would reduce fire danger in the project area, although it may still be a threat. Fire conditions in the San Bernardino National Forest are more dangerous than ever, according to the Forest Service (2006). Decades of fire suppression policy, which led to growth of the understory and bark beetle infestation, is partially to blame for this unprecedented fire hazard. A USFS plan to implement an

aggressive thinning operation that would remove excess fuels to pre-fire suppression levels was finalized in 2006. Until it is implemented, the fire danger remains. Exhibit 2-4, in Section 2, Project Description, shows the required 100-foot fuel modification zone required for any development project that abuts USFS land. Residential lots 14 through 26 are affected by this requirement and must abide by the Fuel Modification Plan required to be prepared for the Proposed Alternative Project (see Section 4.7, Public Services, for this discussion).

Related to this issue, a Water Supply Feasibility Study was prepared for the Proposed Alternative Project that addresses both domestic water supply and water supply for fire flow. As part of the Proposed Alternative Project's permitting process, the Applicant must provide adequate domestic water supply as well as meeting the fire flow requirements established by the County Fire Marshall. Storage capacity for the development would be sized to meet the operational, emergency and fire flow storage requirements. Operational storage would be used to meet the hourly fluctuations in demand during maximum day conditions and must be established as 30 percent of maximum day. Emergency storage would be used to meet demands during a power outage or other emergency situation when supply sources and boosting pumps may not be available; the Big Bear DWP requirements for emergency storage are equivalent to one day of maximum day demand. Fire flow storage capacity would be equal to the fire flow demand (1,750 gpm) times its duration (two-hours). Fire Flow Storage for 1,750 gpm (based on 120 min) is 210,000 gallons (see Section 4.9, Utilities, for this discussion).

Bear Valley Community Plan

General Plan Amendment - Land Use District

The evaluation of the Proposed Alternative Project and its adherence to the Bear Valley Community Plan focuses on consistency with the predetermined General Plan land use policy for the area, compatibility with the surrounding areas, and consistency with the community character.

General Plan Consistency

The project site is designated by the County of San Bernardino Bear Valley Community Plan (BV) as Rural Living with minimum 40-acre lots (BV/RL-40). Therefore, under current conditions, the Applicant is allowed to develop one single-family dwelling unit per 40 acres. Regarding the BV/RL-40, designation, Section BV1.2.2 of the Bear Valley Community Plan states: "In recognition of several large parcels of undeveloped private property that was suitable for future residential development that occur in the unincorporated portion of the valley, residential land use designations were assigned to these properties, but with very low density of development allowed. Appropriate density of future development was intended to be considered at the time that specific development proposals were submitted. Individual projects would address the availability of adequate water supplies, traffic circulation and other infrastructure to support the individual project's proposed density of development. This concept came to be known as the "Holding Zone" approach. The 2006 Bear Valley Community Plan incorporates this strategy from the 1988 Plan. Current residential land use designations on large parcels with low development densities are reflected in such designations as

BV/RL-40 (Rural Living, 40-acre minimum parcel size) and other similar low density designations. Future development proposals will be considered based on a demonstrated ability to provide adequate infrastructure and maintain consistency with the goals and policies of the 2006 Community Plan." As such, this designation can be modified when appropriate measures and development criteria have been fulfilled. Therefore, the County may consider revisions to the land use designation for any specific property to allow more intense development if a proposed project is able to provide adequate water supplies, traffic circulation and other infrastructure to support the individual project's proposed density of development.

The Proposed Alternative Project is not consistent with the County's current Land Use District designation of BV/RL-40, which is a designation for land in rural areas where public infrastructure is not readily available and/or there are environmental constraints such as steep topography, unstable slopes, proximity to earthquake faults or other constraints. The project site is located within the community of Fawnskin adjacent to single family residential neighborhoods to the northwest and southeast. Infrastructure to support the Proposed Alternative Project is available adjacent to the site (see discussion in Section 4.9, Utilities). Therefore, a change in the Land Use District designation for the project site to allow minimum 20,000-square-foot lots is appropriate.

The Tentative Tract Map has been designed as an extension of the existing land use pattern (i.e., neighboring single-family residential uses), but with much less density (minimum 7,200-square-foot for neighboring lots and minimum 20,000-square-foot for the Proposed Alternative Project). The Proposed Alternative Project offers a cohesively planned development which would be subject to compliance with the County's administrative design guidelines and development standards specific to the BV/RS -20M District. The minimum lot size in the Proposed Alternative Project is 20,000 square feet; however, all of the proposed residential lots are at least one half acre in size, with the average lot size being 0.90 acres, and 12 lots are over 1 acre in size.

Surrounding Area and Community Character Consistency

The Bear Valley Community Plan specifies that before a General Plan Amendment can be considered for approval by the County, certain criteria must be met. These criteria are listed in the Goals and Policies section of the plan. The Proposed Alternative Project proposes a Land Use General Plan Amendment. In order to approve such an amendment, the Applicant must prove that the amendment would not have a substantial adverse impact on surrounding properties. In the Bear Valley Community Plan, BV2.2 Goals and Policies, policy BV/LU1.1 specifically states: "Require strict adherence to the Land Use Policy Map unless proposed changes are clearly demonstrated to be consistent with the community character." The elements of community character that the public have identified as important include the following: providing adequate infrastructure, promoting sustainable and beneficial economy, balance between locals and tourists, self sufficient and sustainable public services, and promoting both single family residential development and local level businesses. Because of the higher proposed density of residential units and the lack of conservation

measures, the Original Proposed Project did not meet this guideline. The Proposed Alternative Project better preserves the community character in several important ways:

- The residential density is greatly reduced (gross density is 1 house per 1.25 acres).
- Areas with highly sensitive visual resources, such as the waterfront, are not developed for residential uses and are preserved by conservation and lake access easements.
- Conservation areas are established to protect the most valuable biological resources within the Proposed Alternative Project area (the pebble plain and the bald eagle perches).
- The waterfront will become accessible to the public.

In contrast to the Original Proposed Project, the Proposed Alternative Project is compatible with the community in which it is proposed. The proposed residential unit density will be less dense than the surrounding residential properties and will create a contiguous unit of housing between the eastern and western portions of the Fawnskin community.

Consistency of land uses with the character of a community is also a discretionary, subjective judgment for the County of San Bernardino, as lead agency, to make. The Proposed Alternative Project, as revised, would not violate any community policy or standard set forth in the Community Plan or County General Plan. Policy BV/LU 1.2 C. states that "densities should not be increased unless there are existing or assured services and infrastructure, including but not limited to water, wastewater, circulation, police, and fire, to accommodate the increased densities." The Proposed Alternative Project has produced a secured water source (see Section 4.9, *Utilities*). With regard to impact on cumulative growth, the Proposed Alternative Project will not cross the growth cap threshold but will add to the margin inside which growth is acceptable, until the maximum capacity for build-out of the mountain area is reached.

Bear Valley Community Priorities

The Proposed Alternative Project is consistent with the Community Priorities set forth in the Community Plan Section BV 1.3.3 (BVCP 2007, page 13). The public identified four principal planning issues and concerns. The Proposed Alternative Project addresses these issues as follows:

A community in a forest – the natural environment prevails.

- The Applicant has redesigned the Tentative Tract Map to reduce the density and intensity of the Original Proposed Project from a designation of BV/RS (minimum 7,200-square-foot lots) to a designation of BV/RS-20M (minimum 20,000-square-foot lots) and reducing the number of residential lots from 92 to 50. Although the surrounding, existing designation is RS 7,200, allowing lot sizes of 7,200 square feet, the proposed designation for the Proposed Alternative Project, allows 20,000-square-foot lots. In fact, all residential lots in the planned subdivision are at least one half acre in size, with the average lot size being 0.90 acre, and 12 lots are over 1 acre in size. This allows the individual lot owners to develop their lots, while minimizing

grading and preserving existing trees and other natural features on their lots. In addition, no residential development will occur along the lakefront. The forest and the natural environment will be maintained through the large lot sizes and the preservation of the natural lakefront area.

Ensure no conflict in the interface between the National Forest and adjacent land uses

- The Applicant has designed the Tentative Tract Map (TTM) so that lots that abut the National Forest have adequate depth between the developable area of the site and the National Forest boundary. In addition, as required by the Forest Plan and the County Fire Marshall, owners of these sites are required to maintain a 100-foot fuel modification zone from the National Forest boundary to the interior of the sites. The 10 lots adjacent to the forest range from 0.56 acre to 2.7 acres, with an average lot size of 1.4 acres. Lot depths for the 10 lots range from 206 feet to 474 feet and average 271 feet deep.
- No direct access between the residential lots and the National Forest is proposed; no trails between the site and the forest are proposed as a part of the Proposed Alternative Project.

Conservation of natural resources and scenic beauty.

- The Applicant has proposed to set aside approximately 6 acres of the site for Open Space, Neighborhood Lake Access and Conservation easements in two lettered lots, plus another lettered lot designated for the marina parking lot, but having Open Space value with existing perch trees that would remain in place, these areas are located adjacent to SR-38 so the Open Space component of the Proposed Alternative Project would reduce the overall intensity of use by limiting the number of residential lots that abut SR-38 to nine lots – none on the lake side. In addition, a 10-acre offsite pebble plain habitat would be purchased and dedicated as a Conservation Easement. With no residential development along the lakeshore, the scenic beauty of the lakeshore is conserved. In addition, the use of the property's shoreline as Open Space/Conservation to preserve willow flycatcher habitat, and to minimize the number of trees that would be removed, would continue to provide habitat for a number of bird and mammal species that currently use the site.

  Under the Proposed Alternative Project, the Applicant's plan for natural resources retains the existing mountain character of the community by preserving viewsheds of the lake and leaving harmonious open spaces in Open Space/Conservation easements (pebble plain habitat and lakeshore). SR-38 is no longer proposed for realignment as outlined in the 2005 Final EIR, so impacts will be much less significant using this Proposed Alternative Project design. Additionally, the reduced density of proposed development and an architectural design criteria sympathetic to the mountain area allow the development to better blend into the natural surroundings.

Acknowledge service and infrastructure capacity and limitations of the area, particularly roads and water to serve future development.

- The Applicant has prepared a number of studies to determine the level of service and infrastructure required of the Proposed Alternative Project, including both a Water and Sewer Feasibility Studies (see Section 4.9, Utilities) and a Traffic Impact Analysis (TIA) (see Section 4.8, Traffic and Circulation). These studies show that the Proposed Alternative Project can provide water service for future residential development of the 50 lots via two on-site domestic wells (the third on-site well is a monitoring well) and that there is capacity within the existing sewer and wastewater treatment system to accommodate the 50 new residential lots. The TIA also shows that with implementation of design improvements and the payment of the Applicant's fair share of road/signal infrastructure, impacts on Traffic and Circulation would be less than significant.

Although the Bear Valley Community Plan expresses a need to establish development standards or conditions of approval which adequately address noise potential, no specific standards are included in the Community Plan. The County has general noise standards which apply to this land use. This Proposed Alternative Project is located in a community that has expressed great concern about noise pollution. Without specific noise control criteria, the best strategy is to employ design criteria for structures. Typical noise mitigation measures related to land use are described in Section 4.6, Noise. With overall density of the Proposed Alternative Project being 1 lot per 1.25 acres, typical noise within the subdivision will be dispersed throughout the trees and the 62.43 acres.

Southern California Association of Governments (SCAG)

SCAG's Regional Housing Needs Assessment (RHNA) has projected the housing needs of each city in the County and attempts to strategize for balanced housing availability. However, due to lack of data for the mountain area, SCAG has not yet determined housing needs in the project vicinity. Most cities in southern California are deficient in affordable housing. Clustered development of attached housing units might better satisfy the County's goals and needs for regional housing, but would require a land use designation which is not compatible with the Fawnskin community. This Proposed Alternative Project does not conflict with the County's housing goals, and single unit residential housing on large lots better fits the Bear Valley Community's needs than attached housing units. Single-family housing units under the Proposed Alternative Project are consistent with the existing land use in the general Fawnskin area.

Conflict with Adopted Environmental Plans and Goals of the Community

This threshold is addressed above in the discussion of the Bear Valley Community Plan.

Conflict with Established Recreational, Educational, Religious or Scientific Uses of the Area

The project site is designated as a residential site and does not provide direct access to recreational or educational areas. The site is not used for religious purposes and is not located near a church or other religious facility.

Recreational activities in the area consist of hiking, skiing, boating, biking, and other recreational activities consistent with a mountain community adjacent to a lake. The Proposed Alternative Project would provide a 55-slip boat dock for residents use along with a boat launch and parking lot to accommodate residents use; no public use of the boating facilities is proposed. However, the shoreline would be accessible to local residents who may arrive on foot or bicycle for fishing, bird watching, or other such passive activities. Scientific activities consisting of the study of local sensitive species such as the bald eagle, willow flycatcher and flying squirrel could continue. Also, the pebble plain habitat area and willow flycatcher habitat are being preserved in Open Space/Conservation easements on-site. Therefore, the Proposed Alternative Project would not be in conflict.

Conflict with Any Applicable Habitat Conservation Plan or Natural Community Conservation Plan

The project site is not overlain by a Habitat Conservation Plan (HCP) nor a Community Conservation Plan. Michael Brandman Associates (MBA) conducted a peer review of the biological studies prepared for the 2005 Final EIR. This review included a site visit in December 2006. During the site visit the biologist observed that willow scrub habitat on the lake shoreline had grown up considerably since the site was studied in 2002. The more extensive willow scrub habitat provides greater support for the sensitive species, willow flycatcher. Additionally, the biologist observed the northern half of the project site supports habitat suitable for San Bernardino flying squirrel. USFS studies conducted in the Fawnskin area in 1991 were positive for the presence of this species on USFS land. These existing land use changes are notable and biological surveys were conducted and mitigation measures for those species and habitats affected by this Proposed Alternative Project will be implemented (see Section 4.3, Biological Resources).

Summary of Impacts

The current land use designation of the project site is RL-40. It appears that subsequent development on adjacent and nearby private properties in the Fawnskin community has converted to a higher density on a tract by tract basis, and now the Proposed Alternative Project site is bordered on the west, northwest and southeast by development with a typical residential lot density of 7,200 square feet or greater (see Exhibit 4.5-1). To increase the density of houses in the Proposed Alternative Project to RS-20,000 would be consistent with land uses on private property adjacent to the project site.

4.5.4 - Standard Conditions and Uniform Codes

The County's Erosion and Sediment Control Ordinance applies to the mountain communities that requires submission of an Erosion Control Plan for any construction involving land disturbing activity such as grading and not just projects which excavate more than 2 feet deep or place more than 1 foot of fill, as is the standard for non-mountain areas. Special snow loads structural calculations also

apply to mountain construction. Lot and building sizes and setback requirements follow standard County guidelines, which are outlined as follows:

Proposed zoning: Residential – 20,000 square feet (RS-20,000)

- Front yard setback: 22 feet minimum, 25 feet average;
- Rear yard setback: 15 feet;
- Side yard setback: 10 feet on one side, 5 feet on the other, with a minimum of 20 feet on a corner lot; and
- Fuel modification setback at Proposed Alternative Project edge: 100 feet (this applies to lots 14 through 26).

4.5.5 - Project Design Features

Residences will be custom built by individual lot owners; the Applicant has indicated that lots will not be sold to tract homebuilders to develop. Individual lots have been laid out on the Tract Map to allow the design of future homes to individually fit on the slopes typical of the project site. As opposed to the 92 smaller lots (minimum 7,292 square feet) in the Original Proposed Project, the Proposed Alternative Project's 50 lots will be in excess of one half acre, with 22,120 square feet as the smallest lot; an average lot size of 0.90 square feet; and 12 lots over 1 acre. The Proposed Alternative Project includes a 4.91-acre open space conservation easement to preserve the pebble plain habitat, an open space / neighborhood lake access conservation easement along the lakeshore to preserve willow flycatcher habitat and bald eagle perches; as well as a third lettered lot to develop the marina parking lot and related facilities, which would also preserve existing perch trees and other mature trees near the shoreline. As noted above, a 10-acre offsite pebble plain habitat would also be purchased and dedicated as a Conservation Easement.

4.5.6 - Mitigation Measures

Mitigation measures related to land use, such as noise, traffic, and biological resources, have been incorporated into the other sections as appropriate and the direct impacts on land use will be reduced to less than significant with proper regulatory actions taken at the federal, state and local levels. The Proposed Alternative Project is considerably smaller and less intrusive than the Original Proposed Project. This Proposed Alternative Project would have little impact on Land Use and Land Use Compatibility in the Fawnskin area. No mitigation measures are recommended.

4.5.7 - Level of Significance after Mitigation

Mitigation measures incorporated as a result of other Proposed Alternative Project specific impacts will reduce land use impacts to less than significant levels. No unavoidable significant impacts related to Land Use and Planning have been identified. The analysis in this section should serve to satisfy the requirements of compliance with the San Bernardino General Plan, Land Use Amendment review standards.

4.6 - Noise

4.6.1 - Existing Conditions

The purpose of this section is to analyze Proposed Alternative Project-related noise source impacts onsite and to surrounding land uses. Mitigation measures are also recommended to minimize the noise impacts of the Proposed Alternative Project. This section evaluates short-term construction related impacts as well as long-term buildout conditions. Information in this section was obtained from the County of San Bernardino General Plan and Development Code, San Bernardino County Code, and traffic information contained in the Traffic Impact Analysis (TIA) (refer to Section 4.8, Transportation and Circulation, and Appendix E, Traffic Data). Noise impacts to biological resources are addressed in Section 4.3, Biological Resources. Refer to Appendix D, Noise Data, for additional information.

This analysis is for a Revised and Recirculated Draft Environmental Impact Report (EIR). Recirculation of the Draft EIR is based on revisions made to the Original Proposed Project description after circulation of the Final EIR in December 2005. Revisions to the Original Proposed Project associated with potential noise impacts are discussed below under Methodology and Assumptions.

The proposed Moon Camp Tentative Tract No. 16136 Residential Subdivision (Moon Camp) encompasses 62.43 acres along the northwest shore of Big Bear Lake, in the community of Fawnskin, County of San Bernardino (refer to Exhibit 2-1, Regional Location Map).

The project site is located adjacent to the north of the lake in the eastern portion of Fawnskin (refer to Exhibit 2-2, Project Vicinity Map). More specifically, the site is located in the northern half of Section 13, Township 2 North, Range 1 West, San Bernardino Base and Meridian. The project site is generally situated between Flicker Road to the north, Big Bear Lake to the south, Polique Canyon Road to the east, and Canyon Road to the west. Regional access to the site is provided via State Route 38 (SR-38), which currently bisects the property.

The Proposed Alternative Project is the subdivision of the site into 57 lots, 50 residential lots and seven lettered lots for open space, neighborhood lake access, conservation and common area, on 62.43-acres. Proposed lot sizes range from one-half acre to over 2 acres with an average lot size of 0.90 acre and 12 lots of over 1 acre. The subdivision would be developed for custom lot sales. Overall density of the Proposed Alternative Project is 1.2 acres per dwelling unit. Even though Proposed Alternative Project-specific grading activity would be limited to the construction of the interior streets and infrastructure and no grading of individual lots is proposed, for the purposes of determining the reasonably foreseeable impacts associated with full construction, this analysis assumes the construction of the future homes.

Noise Measurement

Sound is mechanical energy transmitted by pressure waves in a compressible medium, such as air. Sound can be described based on a variety of physical properties of sound waves, including the rate of oscillation (frequency), the distance between successive troughs or crests, the speed of propagation, and the pressure level of the sound wave. The latter is the descriptor commonly used to describe the loudness of sound.

A decibel (dB) is the unit of measure used to describe the loudness of sound. Because the range of sound that humans can hear is quite large, the dB scale is logarithmic, making calculations more manageable. In addition, the human ear is not equally sensitive to all sound frequencies, so "A-weighting" is used. A-weighting units are written as dBA. According to the California Department of Transportation (Caltrans), a change of 3 dBA, increases or decreases, are barely perceivable to a person with average hearing capability, while a change of 5 dBA is readily perceptible.

Noise is defined as unwanted or objectionable sound. Sound is usually considered unwanted when it interferes with normal activities, when it causes physical harm, and when it has adverse effects on health. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment. Because noise plays a major role both in quality of life, and also physical health, the regulation of noise is important, especially when considering residential development.

Several statistical measurements have been developed to address community noise levels over a period of time. The two most common averaged measurements are Community Noise Equivalent Level (CNEL) and Equivalent Noise Level. CNEL is a 24-hour noise descriptor which has been adjusted to account for some individuals' increased sensitivity to noise during evening and night hours. A CNEL noise measurement is obtained after adding 5.0 dB to sound levels occurring between 7 p.m. and 10 p.m., and 10.0 dB to sound levels occurring from 10 p.m. to 7 a.m. These added dBs are required by state law to account for the community's increased sensitivity during these hours.

Equivalent Noise Level (L_{eq}) is another averaged noise measurement. L_{eq} can be measured over any time period, but is typically measured for intervals of 1 minute, 15 minutes, 1 hour or 24 hours. For example, $L_{eq(24)}$ would represent a 24-hour average. When no period is specified, a 1-hour average is assumed. Table 4.6-1 shows typical A-weighted sound levels for ordinary activities and traffic.

Table 4.6-1: Sound Levels and Human Response

Noise Source (at a Given Distance)	dBA Noise Level	Response
Carrier Jet Operation	140	Harmfully loud
	130	Pain Threshold
Jet Takeoff (200 ft) Night club	120	
Unmuffled Motorcycle Auto Horn (3 ft) Rock Band Riveting Machine	110	Maximum Vocal Effort Physical Discomfort
Loud Power Mower Jet Takeoff (2,000 ft) Garbage Truck	100	Very Annoying Hearing Damage (Steady 8-hour Exposure)
Heavy Drill (50 ft) Pneumatic Drill (50 ft)	90	
Alarm Clock Freight Train (50 ft) Vacuum cleaner (10 ft)	80	Annoying
Freeway Traffic (50 ft)	70	Telephone Use Difficult
Dishwashers Air Conditioning Unit (20 ft)	60	Intrusive
Light Auto Traffic (100 ft)	50	Quiet
Living Room Bedroom	40	
Library Soft Whisper (15 ft)	30	Very Quiet
Broadcasting Studio	20	Just Audible
	10	Threshold of Hearing
Source: Beland and Branch 1970.		

It is widely accepted that the average healthy ear can barely perceive increases or decreases of 3 dBA, but that a change of 5 dBA is readily perceptible.

The following is a list of common terms and abbreviations used to describe noise:

Ambient Noise – The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

dB (Decibel) – The unit of measure that denotes the ratio between two quantities that are proportional to power; the number of decibels corresponding to the ratio of the two amounts of power based on a logarithmic scale.

dBA (A-weighted decibel) – The A-weighted decibel scale that most closely approximates the sensitivity of the human ear. The scale ranges from zero for the average least perceptible sound to about 130 for the average pain level.

LEQ (Equivalent energy level) – The average acoustic energy content of noise during the time it lasts. The LEQ of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure, no matter what time of day they occur.

CNEL (Community Noise Equivalent Level) – The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of 5 decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

Noise Contours – Lines drawn around a noise source indicating equal levels of noise exposure.

Sensitive Receptors – Activities or land uses that may be subject to the stress of significant interference from noise. Land uses associated with sensitive receptors often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, education facilities, and libraries.

Environmental Setting

Sensitive Receptors

As defined above, receptors include land uses particularly sensitive to noise such as schools and day-care facilities, parks and recreation areas, convalescent facilities and medical facilities. Residential areas are also considered sensitive, particularly during nighttime hours. Existing sensitive receptors within the vicinity of the project site include residential uses to the east along SR-38, to the west along Canyon Road and to the north along Flicker Road. Non-residential sensitive receptors are listed in Table 4.6-2.

Table 4.6-2: Non-Residential Sensitive Receptors in the Proposed Project Area

Receptor Type	Facility Name	Address	Distance and direction from project site
School	North Shore Elementary School	765 N. Stanfield Cutoff	2.5 miles east
School	Big Bear Middle School	41275 Big Bear Boulevard	2 miles southeast
Hospital	Big Bear Valley Community Hospital	41870 Garstin Road	2.4 miles east southeast

Table 4.6 2 (cont.): Non-Residential Sensitive Receptors in the Proposed Project Area

Receptor Type	Facility Name	Address	Distance and direction from project site
Library	Big Bear Lake Branch Library	41930 Garstin Drive	*Approximately 3 miles southeast
Church	Seventh Day Adventist	340 E. North Shore Drive	6.3 miles east
Church	St. Joseph's Catholic Church of Big Bear	42242 North Shore Drive	3.9 miles east
Church	Church of Jesus Christ of Latter-Day Saints	400 E. North Shore Drive	6.3 miles east
Church	St. Columba's Episcopal Church	42324 North Shore Drive	4.4 miles east
Church	Shepherd in the Pines Lutheran Church	42450 North Shore Drive	4.1 miles east
Church	Center for Creative Living	816 W. Big Bear Boulevard	5.4 miles east
Church	First Baptist Church of Big Bear Valley	41960 Big Bear Boulevard	*Approximately 2.5 miles southwest
Church	Church of Christ	41035 Big Bear Boulevard	*Approximately 2 miles southeast
Church	Bear Valley Community Church	40946 Big Bear Boulevard	*Approximately 2 miles southeast
Church	Assembly of God	41965 Garstin Road	*Approximately 3 miles southeast
Church	Big Bear Believer's Chapel	42180 Moonridge Road	*Approximately 3 miles southeast
Church	First Church of Christ Scientist	547 Cottage Lane	*Approximately 2 miles southeast
Church	Big Bear Foursquare Church	101 E. Mojave	6.6 miles east
Church	Big Bear Christian Center	800 Greenspot	9.3 miles east
Church	Jehovah's Witnesses	255 Catalina Street	*Approximately 3.5 miles southeast
Church	United Methodist Church	1001 Holden Avenue	5.5 miles east
Church	Calvary Chapel of Big Bear	713 Stocker Road	*Approximately 2.5 miles southeast
Church	Presbyterian Church	575 Prairie Lane	*Approximately 1.5 miles south
Park	Grout Bay Park	Southwestern corner of Grout Bay	Approximately .6 mile southwest
Park	Dana Point Park	Northern side of Grout Bay	Approximately .3 mile northwest

Table 4.6 2 (cont.): Non-Residential Sensitive Receptors in the Proposed Project Area

Receptor Type	Facility Name	Address	Distance and direction from project site
Park	Meadows Edge Park	East of Bluebird Lane and adjacent to the northern side of Big Bear Lake	Approximately 1.5 miles southeast
Recreation Area	Grout Bay Recreation Area	West of Grout Bay	Approximately 1 mile southwest
Campgrounds	Serrano Campgrounds	Southwest of the intersection of Holcomb Valley Road and Highway 38	Approximately 1 mile southeast
National Forest	San Bernardino National Forest Lands	San Bernardino National Forest	Adjacent to and possibly part of project site
Lake	Big Bear Lake	San Bernardino County	Approximately .5 mile south
Source: Big Bear Chamber of Commerce website. July 2002.			

Existing Noise Levels

Noise Modeling

The existing and future roadway noise levels in the project area were projected using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) along with other roadway and Proposed Alternative Project site parameters. These parameters determine the projected impact of vehicular traffic noise and include the roadway cross-section (e.g., number of lanes), the roadway width, the average daily traffic (ADT), the vehicle travel speed, the percentages of auto and truck traffic, the roadway grade, the angle-of-view, the site conditions ("hard" or "soft"), and the percent of total ADT which flows each hour throughout a 24-hour period. Modeling is based on traffic estimates in the Revised TIA (see Appendix E).

The noise modeling was based on project details prior to 2007 revisions. As the Proposed Alternative Project revisions scaled back the project, the modeling presents a "worse-case" scenario.

Existing Noise Levels

Table 4.6-3, Existing Traffic Noise Levels, indicates the location of the 60, 65, and 70 CNEL noise contours associated with traffic along local roadways using the Federal Highway Administration (FHWA) computer model. Traffic noise along three major roadways in the project area was modeled to determine current noise levels from traffic. The roadways include North Shore Drive, Stanfield Cutoff, and Big Bear Boulevard, as described in Table 4.6-3.

Table 4.6-3: Existing Traffic Noise Levels

Roadway Segment	Average Daily Traffic	dBA at 100 Feet from Roadway Centerline[1]	Distance from Roadway Centerline to: (feet)		
			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour
North Shore Drive:					
West of Stanfield Cutoff	4,750	57.17	15	19	69
East of Stanfield Cutoff	6,900	58.79	19	41	88
Stanfield Cutoff:					
North of North Shore Dr	125	32.22	0	1	2
North Shore Dr to Big Bear Blvd	5,625	57.90	17	36	77
South of Big Bear Blvd	2,250	49.15	4	9	20
Big Bear Boulevard:					
West of Stanfield Cutoff	20,500	62.87	39	85	183
East of Stanfield Cutoff	18,100	62.32	36	78	168

Traffic data obtained from the Traffic Impact Analysis (refer to Appendix E,, Traffic Data). Based on peak monthly traffic volumes.
[1] 100 feet is the assumed distance to the midpoint of a receptor rear yard.

Existing Watercraft Noise Levels

Watercraft, including boats, jet skis, etc., constitutes a periodic noise around the perimeter of Big Bear Lake. According to the Big Bear Municipal Water District, during the 2008 boating season, the average daily use of boats on the Lake was approximately 106 with peak day average use being 207 (weekends). Typical noise levels for the watercraft expected at Big Bear Lake include a ski boat 46 to 59 dBA at 100 feet, a jet ski at 103 dBA at 80 feet (http://www.ninovan.com/sound.htmlx), and outboard motor on a fishing boat at 100 dBA onboard (http://www.engineeringtoolbox.com/sound-power-level-d_58.html). Boating activity in Big Bear Lake is governed by the Big Bear Municipal Water District (BBMWD) and the California Harbors and Navigation Code. These regulations help to reduce noise as a result of boating.

4.6.2 - Regulatory Setting

State

Caltrans Vibration Exposure Thresholds

Construction vibration is regulated in accordance with standards established by the Transportation and Construction-Induced Vibration Guidance Manual issued by Caltrans.

California Government Code

California Government Code Section 65302 (f) mandates that the legislative body of each county and city adopt a noise element as part of their comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of "normally acceptable," "conditionally acceptable" and "clearly unacceptable" noise levels for various land use types. Single-family homes are "normally acceptable" in exterior noise environments up to 60 CNEL and "conditionally acceptable" up to 70 CNEL. Multiple-family residential uses are "normally acceptable" up to 65 CNEL and "conditionally acceptable" up to 70 CNEL. Schools, libraries and churches are "normally acceptable" up to 70 CNEL, as are office buildings and business, commercial and professional uses.

Local

San Bernardino County General Plan

General Plan Noise Element Goals/Policies

The purpose of the 2007 San Bernardino County General Plan Noise Element is to limit the exposure of the community to excessive noise levels by requiring local agencies to analyze and quantify noise levels and the extent of noise exposure through actual measurement or the use of noise modeling. Countywide policies for noise include:

N 1.1. Designate areas within San Bernardino County as "noise impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Chapter 87.09 of the Development Code.

N 1.2. Ensure that new development of residential or other noise-sensitive land uses is not permitted in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to the standards of noise-sensitive land uses include residential uses, schools, hospitals, nursing homes, places of worship and libraries.

N 1.3. When industrial, commercial, or other land uses, including locally regulated noise sources, are proposed for areas containing noise sensitive land uses, noise levels generated by the proposed use will not exceed the performance standards of Table N-2 within outdoor activity areas. If outdoor activity areas have not yet been determined, noise levels shall not exceed the performance standards listed in Chapter 83.01 of the Development Code at the boundary of areas planned or zoned for residential or other noise-sensitive land uses.

N 1.4. Enforce the state noise insulation standards (California Administrative Code, Title 24) and Chapter 35 of the California Building Code (CBC).

N 1.5. Limit truck traffic in residential and commercial areas to designated truck routes; limit construction, delivery, and through-truck traffic to designated routes; and distribute maps of approved truck routes to County traffic officers.

N 1.6. Enforce the hourly noise-level performance standards for stationary and other locally regulated sources, such as industrial, recreational, and construction activities as well as mechanical and electrical equipment.

N 1.7. Prevent incompatible land uses, by reason of excessive noise levels, from occurring in the future.

N 2.1. The County will require appropriate and feasible on-site noise attenuating measures that may include noise walls, enclosure of noise generating equipment, site planning to locate noise sources away from sensitive receptors, and other comparable features.

N 2.2. The County will continue to work aggressively with federal agencies, including the branches of the military, the U.S. Forest Service, BLM, and other agencies to identify and work cooperatively to reduce potential conflicts arising from noise generated on federal lands and facilities affecting nearby land uses in unincorporated County areas.

The following additional policies are specific to the Mountain Region

M/N 1.1. Encourage and support strict enforcement of vehicle code regulations to reduce vehicular noise in the mountain communities.

M/N 1.2. Encourage responsible agencies to post signs near forest access roads which explain the acceptable vehicular noise levels for vehicles using those roads.

San Bernardino County Code

Title 8 of the San Bernardino County Code is the Development Code. Section 87.0901 of the Development Code sets forth performance standards designed to mitigate environmental impacts of existing and proposed land uses within a community, including noise and vibration. Performance standards protect the health and safety of workers, nearby residents and businesses; and prevent damaging effects to surrounding properties.

Noise

Areas within San Bernardino County shall be designated as “noise-impacted” if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Tables 4.6-4 and 4.6-5, below. Exemptions from these standards include motor vehicles not under the control of the industrial use, emergency equipment, vehicles and devices, and temporary construction and repair or demolition activities taking place between the hours of 7 a.m. and 7 p.m. Monday through Saturday, excluding federal holidays.

New development of residential or other noise-sensitive land uses are not permitted in noise impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to these standards. The Development Code defines noise-sensitive land uses as residential, schools, hospitals, nursing homes, churches, and libraries.

Table 4.6-4: San Bernardino County Noise Standards - Stationary Noise Sources

Affected Land Uses (Receiving Noise)	7 am-10 pm Leq* (dBA)	10 pm-7 am Leq* (dBA)
Residential	55	45
Professional Services	55	55
Other Commercial	60	60
Industrial	70	70
Source San Bernardino County Development Code, Section 87.09.01.		

Table 4.6-5: San Bernardino County Noise Standards - Adjacent Mobile Noise Sources

Land Use		Ldn (or CNEL) dBA	
Categories	**Uses**	**Interior**	**Exterior[1]**
Residential	Single and multi-family, duplex, mobile homes	45	60
Commercial	Hotel, motel, transient housing commercial retail, bank, restaurant office building, research and development, professional offices amphitheater, concert hall, auditorium, movie theater	45 50 45 45	60 NA 65 NA
Institutional/ Public	Hospital, nursing home, school classroom, church, library	45	65
Open Space	Park	NA	65

[1] An exterior noise level of up to 65 dB(A) (or CNEL) will be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level will necessitate the use of air conditioning or mechanical ventilation.

Source San Bernardino County Development Code, Section 87.09.01.

Vibration

Section 87.0901 of the Development Code also governs vibration and indicates that no ground vibration is allowed which can be felt without the aid of instruments at or beyond the lot line, nor is any vibration to be permitted which produces a particle velocity greater than or equal to two-tenths

(0.2) inches per second measured at or beyond the lot line. The following sources of vibration are not regulated by the Development Code, motor vehicles not under the control of the subject use and temporary construction, maintenance or demolition activities between 7:00 a.m. and 7:00 p.m. except Sundays and Federal holidays.

Comments from the March 31, 2007, Public Meeting

The following are public comments received during the March 31, 2007, Public Meeting related to

Land Use Compatibility and Noise:

- Address how 50 new homes will contribute to increased ambient noise and light in the vicinity and address the difference between owner occupied homes and rental homes; and
- Address the proposed location of the marina and impacts to surrounding properties from light, noise, trash, and other issues.

4.6.3 - Thresholds of Significance

The following criteria for establishing the significance of potential impacts on noise were derived from Appendix G of the CEQA guidelines. A significant impact would occur if the proposed project would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels; or
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

As the Proposed Alternative Project is not within an airport land use plan or within 2 miles of a public airport or airstrip, the last two criteria do not apply.

4.6.4 - Methodology and Assumptions

The analysis for the 2005 Final EIR was based on the noise modeling results. which were in turn based on the September 2003 TIA prepared by Kunzman Associates. An updated TIA was prepared by Urban Crossroads in June 2007 based on revisions to the Proposed Alternative Project description. This Revised and Recirculated Draft EIR noise analysis is based on the use of the September 2003 TIA, as the noise modeling was conducted with the data contained in the analysis. The December 2005 data represents worst-case conditions and impacts will be determined based on the impacts in the 2005 Final EIR. Wherever practicable, a more specific interpretation was made from the June 2007 TIA.

As discussed in Section 4.6-1 above, even though Proposed Alternative Project grading activity would be limited to the construction of the interior streets and infrastructure and no grading of individual lots is proposed, for the purposes of determining the reasonably foreseeable impacts associated with full construction, this analysis assumes the construction of the future homes.

Short-term noise impacts were evaluated based on typical noise levels associated with construction equipment, derived from existing environmental documentation. Predicted areas of potential impact were calculated assuming an average noise attenuation rate of 6 dBA per doubling of distance from the source. Long-term noise impacts were evaluated based on predicted near-term and future cumulative traffic noise levels, with and without implementation of the Proposed Alternative Project. Traffic noise levels were predicted using the FHWA roadway noise prediction model (FHWA-RD-77-108), based on data obtained from the September 2003 TIA prepared for the Original Proposed Project (92 residential lots).

Short-term groundborne vibration impacts were analyzed using typical maximum vibration levels from construction equipment expected for the Proposed Alternative Project. This equipment includes heavy-duty trucks, backhoes, and front-end loaders, mainly used during the site preparation phase.

Long-term noise impacts were based on a comparison of expected traffic volumes with and without the Proposed Alternative Project. Stationary sources of noise from recreational uses were also estimated.

Responses to Comments Received from the Public

Contribution on Increased Ambient Noise

With regard to the request from the public to address how 50 new homes would contribute to increased ambient noise in the vicinity, the Proposed Alternative Project includes 50 residential lots on approximately 62.43 acres with a minimum lot size of one half acre, average lot size of 0.90 acre, and 12 lots that are over 1 acre in size. This tract represents a very low density neighborhood in comparison to the adjacent residential neighborhood on the north, east, west and southerly boundaries of the project site, which are designated as BV/RS with minimum lots sizes of 7,200 square feet.

Therefore, the Proposed Alternative Project would likely have a negligible impact on the ambient noise environment due to its low density nature.

Comment on Owner vs. Renter Occupancy – Increased Noise Levels

With regard to the request from the public to address the difference between owner occupied homes and rental homes; the Proposed Alternative Project is the development of a tract of 50 residential lots with three lettered lots that would be sold as individual lots for custom built homes. The Proposed Alternative Project's Conditions, Covenants and Restrictions (CC&Rs) would prohibit the short term (less than 30 days) rental of any of the 50 houses within the subdivision. As a result, there would be no change in the noise levels.

Comment on Potential Noise from the Marina

With regard to the request to address the location of the marina and potential impacts associated with light, noise, trash, and other issues the proposed location of the marina is adjacent to Letter Lot C, situated between SR-38 and the lakeshore. Exhibit 2-5 shows the proposed location of the marina. At this location the dock is relatively isolated in that it would be adjacent to Lot C which would not be developed as a residential lot. The nearest existing residence is approximately 300 feet to the northeast. Therefore, the Proposed Alternative Project, as designed, would likely have a negligible impact.

4.6.5 - Impacts and Mitigation Measures

Neither the California Environmental Quality Act (CEQA) Guidelines, the County of San Bernardino General Plan, nor the Development Code provides a definition of what constitutes a substantial noise increase. A common practice has been to assume that minimally perceptible to clearly noticeable increases of 3 to 5 dBA represent a significant increase in ambient noise levels. A sliding scale is commonly used to identify the significance of noise increases, allowing greater increases at lower absolute sound levels than at higher sound levels. This approach is based on research that relates changes in noise to the percentage of individuals that would be highly annoyed by the change (FICON 1992). The significance criteria for changes in noise from project operations are as follows:

- A 3-dBA CNEL increase in noise as a result of project operations, if the existing noise level already exceeds the "Acceptable" range for the land use (55 dBA CNEL or less for daytime residential uses—see Table 4.6-4).
- A 5-dBA CNEL increase in noise as a result of project operations, if the existing noise level is in the "Acceptable" range and the resulting level remains within the "Acceptable" range for the land use.

The County Development Code does not permit any vibration which produces a particle velocity greater than or equal to two-tenths (0.2). Construction is exempt from vibration standards provided construction activity is limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Saturday.

Construction Noise

Impact Analysis

Construction noise represents a short-term increase in ambient noise levels. Noise impacts from construction activities associated with the Proposed Alternative Project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities.

Short-term noise impacts could occur during construction activities; either from the noise impacts created from the transport of workers and movement of construction materials to and from the Proposed Alternative Project site, or from the noise generated onsite during ground clearing, excavation, grading, and construction activities. Table 4.6-6 lists typical construction equipment noise levels for equipment that would be used during construction of the Proposed Alternative Project. Construction activities are carried out in discrete steps, each of which has their own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise levels surrounding the construction site as work progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow noise ranges to be categorized by work phase.

Table 4.6-6: Noise Associated With Typical Construction Equipment

Construction Equipment	Maximum Noise Levels (dBA at 50 feet from source)
Grading	89
Backhoe	90
Pneumatic tools	88
Air compressor	86
Crane	83
Plate compactor	89
Concrete vibrator	85
Heavy truck	87
Source: Federal Transit Administration, 1995.	

The residential land uses to the southeast along SR-38, to the west along Canyon Road and to the north along Flicker Road, are the sensitive receptors of most concern as they relate to the Proposed Alternative Project construction noise. The edge of the project site is adjacent to the backyards of some of these residences. The noise level at the nearest residences could be greater than 90 dBA during various phases of Proposed Alternative Project construction. Noise at this level would result in a temporary increase in ambient noise levels. Although construction activities would occur during daytime hours, construction noise could still be considered substantially disruptive to residents. However, periods of intrusive noise exposure would be temporary, and noise generated by Proposed

Alternative Project construction would be partially masked by existing noise from traffic. Note that construction noise often varies significantly on a day-to-day basis, and the noise levels shown in Table 4.6-6 represents a worst-case scenario. This is a potentially significant impact.

In addition to construction noise from the project site, construction activities would also result in traffic noise along access routes to the site due from transport of equipment and workers on the site. The primary heavy equipment construction vehicles are expected to be moved on to the site once during the initial grading and would have a less than significant short-term effect on noise levels. Daily transportation of construction workers is not expected to cause a significant effect since this traffic would not be a substantial percentage of current daily volumes in the area, and would not be anticipated to increase traffic noise levels by more than 1 dBA.

According to Table 4.6-4, the maximum permitted noise exposure to residential uses from stationary sources is 55 dBA Leq from 7:00 a.m. to 10:00 p.m., and 45 dBA Leq from 10:00 p.m. to 7:00 a.m. Locally regulated sources are stationary and not pre-empted from local noise control. Pre-empted sources include vehicles operated on public roadways, railroad line operations and aircraft in flight. As stated in Table 4.6-5, the maximum permitted noise exposure to residential uses from mobile noise sources is 60 dB (Ldn or CNEL). However, an exterior noise level up to 65 dB (or CNEL) is allowed if exterior noise levels have been substantially mitigated through the implementation of best available noise reduction technology and the interior noise exposure does not exceed 45 dB (or CNEL) with windows and doors closed.

Proposed Alternative Project construction activities would temporarily increase local noise and vibration levels in the project study area and may temporarily exceed County standards. However, the County of San Bernardino Development Code exempts construction activities from adhering to County noise standards as long as construction is limited to the hours of 7:00 a.m. to 7:00 p.m., Monday to Saturday, and prohibited on Sundays or Federal Holidays. This exemption recognizes the inherent and often unavoidable noise associated with construction activities and the limited duration of such impacts. Accordingly, as long as the construction activities occur during the least noise sensitive time of the day, such activities are not subject to the noise ordinance. With adherence to the County Development Code and the noise-related policies in the County General Plan, and due to the relatively short period of construction, noise impacts are anticipated to be less than significant. Implementation of the recommended mitigation measures would ensure that impacts remain at or below less than significant levels.

Mitigation is proposed that would require the Applicant to implement construction noise control measures into the Proposed Alternative Project and comply with the County's construction noise requirements. While the closest residences would experience exterior noise levels greater than 60 dBA, construction noise is temporary and exempt from the County's land use compatibility noise standards. Therefore, implementation of the mitigation measures would be sufficient to reduce construction noise impacts to a level of less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

NOI-1 Construction contractors shall be required to ensure that construction equipment is well tuned and maintained according to the manufacturer's specifications, and that the equipment's standard noise reduction devices are in good working order.

NOI-2 Consistent with the County of San Bernardino Development Code Section 87.0901, construction activities shall be limited as follows:

For general construction activities, the operation of construction equipment and outdoor construction or repair work shall be limited to the hours between 7:00 a.m. and 7:00 p.m., Monday through Saturday.

NOI-3 Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturers' specifications) and by shrouding or shielding impact tools. All equipment shall have sound-control devices no less effective than those provided by the manufacturer.

NOI-4 Construction activities contractors shall locate fixed construction equipment (such as compressors and generators) and construction staging areas as far as possible from adjacent residences. Activities within these staging areas shall conform to the time limitations established in Mitigation Measure NOI-2.

Level of Significance After Mitigation

Less than significant impact.

Groundborne Vibration

Impact Analysis

This impact discussion analyzes the potential for short-term construction and long-term operational impacts due to excessive levels of groundborne vibration.

Construction Vibration

Construction activities can produce vibration that may be felt by adjacent uses. The construction of the Proposed Alternative Project would not require the use of equipment such as jackhammers and pile drivers, which are known to generate substantial construction vibration levels. The primary sources of vibration during construction would be from bulldozers, backhoes, crawler tractors, and scrapers used during site preparation. A vibratory roller would produce the greatest amount of vibration on the project site, with a 0.21 peak particle velocity (PPV) at 25 feet. As noted under the discussion of construction impacts, the nearest sensitive receptors have backyards adjacent to the project site.

Vibration impacts from construction activities associated with the Proposed Alternative Project would be a function of the construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities.

The residential land uses to the southeast along SR-38, to the west along Canyon Road and to the north along Flicker Road, are the sensitive receptors of most concern as they relate to the Proposed Alternative Project construction potential for vibration. The edge of the project site is adjacent to the backyards of some of these residences. Vibration levels could reach a peak of 0.21 at 25 feet during certain phases of Proposed Alternative Project construction. Although construction activities would occur during daytime hours, construction vibration could still be considered disruptive to residents. However, periods of vibration would be temporary, and vibration would be partially masked by existing noise from traffic. With mitigation, this is a less than significant impact.

In addition to construction vibration from the project site, construction activities may also result in vibration from traffic along access routes to the site due from transport of equipment and workers on the site. The primary heavy equipment construction vehicles are expected to be moved on to the site once during the initial grading and would have a less than significant short-term effect on vibration levels. Daily transportation of construction workers is not expected to cause a significant effect since this traffic would not be a substantial percentage of current daily volumes in the area, and would not be anticipated to increase traffic vibration to a perceptible level.

The County of San Bernardino Development Code does not permit any vibration which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second measured at or beyond the lot line. However, temporary construction is exempted from these requirements as long as activities are limited to the hours of 7:00 a.m. and 7:00 p.m., Monday through Saturday.

Proposed Alternative Project construction activities would result in temporary vibration that is 0.01 above the County standards and therefore may temporarily exceed County standards. However, the County of San Bernardino Development Code exempts construction activities from adhering to County noise standards as long as construction is limited to the hours of 7:00 a.m. to 7:00 p.m., Monday to Saturday and prohibited on Sundays or federal holidays. With adherence to the County Development Code, and due to the relatively short period of construction and even shorter periods of vibration, impacts are anticipated to be less than significant. Implementation of the recommended mitigation measure would ensure that impacts remain at or below less than significant levels.

Operational Vibration

Following completion of the Proposed Alternative Project (assuming full future buildout of the residential lots), no increases in vibration would be expected. The additional residences would not be expected to attract vehicles that would result in groundborne vibration, with the possible exception of increased recreation vehicle (RV), fifth-wheel trailers, and watercraft trailers. As discussed further below, boating use is only expected to increase by less than nine boats daily, and would not cause

perceptible vibration over existing boat traffic. Vibration would not be expected from RVs or trailers as they are generally hauled and parked for several days or more, or permanently parked at a residence. Vibration impacts from the operation of the Proposed Alternative Project would be less than significant.

Level of Significance Before Mitigation
Potentially significant.

Mitigation Measures
NOI-1, NOI-2, and NOI-4, as listed above.

Level of Significance After Mitigation
Less than significant impact.

Operational Noise – Mobile Sources

Impact Analysis

Traffic

Proposed Alternative Project operation would result in increased traffic on roadways in the project area, thereby increasing vehicular generated noise near existing and proposed residential uses. Traffic conditions were analyzed utilizing existing, Year 2006, and Year 2025 traffic volumes from the September 2003 TIA and the 2005 Final EIR. Revisions to the Proposed Alternative Project include the reduction of residential lots from 92 to 50, and therefore these previous studies represent a worst-case scenario and have been determined adequate for analysis in this Revised and Recirculated Draft EIR.

For purposes of analyzing noise impacts associated with Proposed Alternative Project-related traffic volumes, this section compares the following scenarios:

1. Existing Plus Other Development Traffic Conditions (Year 2006) versus Existing Plus Proposed Alternative Project Plus Other Development Traffic Conditions (Year 2006) and;
2. Existing Plus Other Development Traffic Conditions (Year 2025) versus Existing Plus Proposed Alternative Project Plus Other Development Traffic Conditions (Year 2025).

Thus, in accordance with the Proposed Alternative Project TIA, with and without the Proposed Alternative Project scenarios were modeled for Year 2006 and Year 2025 traffic conditions.

According to the September 2003 TIA, 25 percent of the project traffic distribution would be distributed to the west of the project site. The following roadways segments to the west of the project site would receive traffic from the project site:

- North Shore Drive: North of Big Bear Boulevard and Dam (Existing ADT = 2,300);
- Rim of the World Highway: West of North Shore Drive (Existing ADT = 7,100); and

- Big Bear Boulevard: East of North Shore Drive (Existing ADT = 7,300).

Using a worst-case assumption of 220 trips (25 percent of 880 trips) along North Shore Drive, north of Big Bear Boulevard and Dam, under existing conditions, the vehicular noise level along this roadway segment would increase by 0.42 dBA[1]. Thus, noise impacts along this roadway segment would be less than significant based on the discussion of significance criteria in Section 4.6-6, Impacts and Mitigation Measures.

Therefore, since the roadway segments along Rim of the World Highway (west of North Shore Drive) and Big Bear Boulevard (East of North Shore Drive), would receive 15 percent and 10 percent of the Proposed Alternative Project traffic, respectively, coupled with the fact that traffic volumes are greater on these segments than on North Shore Drive, noise level increases along these segments as a result of Proposed Alternative Project generated traffic would be less than 0.42 dBA (see footnote 1). Thus, based on the discussion of significance criteria in Section 4.6-6, Impacts and Mitigation Measures, noise impacts along these roadway segments would be les than significant under existing and future traffic scenarios.

Year 2006 Traffic Conditions

Noise levels near the project area were modeled using with and without Proposed Alternative Project scenarios for 2006 traffic conditions to determine the location and extent of future vehicular generated noise conditions. Table 4.6-7, Exterior Noise Exposure Adjacent to Nearby Roadways, 2006, indicates the noise increase and/or decrease for the analyzed roadways within the County of San Bernardino and City of Big Bear Lake.

According to Table 4.6-7, under the "2006 Without Proposed Alternative Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 32 to 63 dBA. The highest noise levels would occur on Big Bear Boulevard, west of Stanfield Cutoff. The lowest noise levels would occur along Stanfield Cutoff (north of North Shore Drive). Under the "2006 With Proposed Alternative Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 32 to 63 dBA. Similar to the "2006 Without Proposed Alternative Project" scenario, the highest and lowest noise levels would occur along Big Bear Boulevard (west of Stanfield Cutoff) and Stanfield Cutoff (north of North Shore Drive), respectively. The table also compares noise levels under the "2006 Without Proposed Alternative Project" scenario with the "2006 With Proposed Alternative Project" scenario. Based on the information cited in Table 4.6-7, all roadway segments comparatively analyzed would experience a noise increase of less than 1 dBA at 100 feet from the roadway centerline. Thus, noise impacts along all the roadway segments would be less than significant based on the significance criteria in Section 4.6.6.

[1] Based on Original Proposed Project of 92 residential lots. Proposed Alternative Project of 50 residences would result in an increase of less than 0.42 dBA.

Table 4.6-7: Exterior Noise Exposure to Nearby Roadways, 2006

Roadway Segment	2006 Without Proposed Alternative Project					2006 With Proposed Alternative Project					Difference in dBA at 100 Feet from Roadway
	Average Daily Traffic	dBA at 100 Feet From Roadway Centerline[1]	Distance from Roadway Centerline (in feet) to: 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	Average Daily Traffic	dBA at 100 Feet From Roadway Centerline	Distance from Roadway Centerline (in feet) to: 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
North Shore Drive:											
West of Stanfield Cutoff	4,988	57.38	15	33	71	5,655	57.92	17	20	77	0.54
East of Stanfield Cutoff	7,245	59.00	20	42	91	7,245	59.00	20	42	91	0.00
Stanfield Cutoff:											
North of N. Shore Dr.	131	32.42	0	1	2	131	32.42	0	1	2	0.00
N. Shore Dr. to Big Bear Blvd.	5,906	58.11	17	37	80	6,573	58.58	18	40	86	0.47
South of Big Bear Blvd.	2,363	49.36	4	10	21	2,363	49.36	4	10	21	0.00
Big Bear Boulevard:											
West of Stanfield Cutoff	21,525	63.08	41	88	188	21,792	63.13	41	88	190	0.05
East of Stanfield Cutoff	19,005	62.54	37	81	173	19,405	62.63	38	82	176	0.09

Note:
[1]=100 feet is the assumed distance to the midpoint of a receptor rear yard.
Noise level models computed for 2006 scenarios utilized existing 2002 roadway cross-section data.
Source: Traffic data obtained from the 2003 TIA (refer to Appendix 15.3, Traffic Data, in the 2005 Final EIR).

Year 2025 Traffic Conditions

Noise levels within the vicinity of the project area were modeled for with and without Proposed Alternative Project scenarios for 2025 traffic conditions to determine the location and extent of future vehicular generated noise conditions. Table 4.6-8 indicates the noise increase and/or decrease for the analyzed roadways within the County of San Bernardino and City of Big Bear Lake. According to Table 4.6-8, under the "2025 Without Proposed Alternative Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 33 to 64 dBA. The highest noise levels would occur on Big Bear Boulevard, west of Stanfield Cutoff. The lowest noise levels would occur along Stanfield Cutoff (north of North Shore Drive).

As shown in Table 4.6-8, under the "2025 With Proposed Alternative Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 33 to 64 dBA. Similar to the "2025 Without Proposed Alternative Project" scenario, the highest and lowest noise levels would occur along Big Bear Boulevard (west of Stanfield Cutoff) and Stanfield Cutoff (north of North Shore Drive), respectively.

Table 4.6-8 also compares noise levels under the "2025 Without Proposed Alternative Project" scenario with the "2025 With Proposed Alternative Project" scenario. Based on the information cited in Table 4.6-8, all roadway segments comparatively analyzed would experience a noise increase of less than 1 dBA at 100 feet from the roadway centerline. Thus, noise impacts along all the roadway segments would be less than significant based on the significance criteria in Section 4.6.6, Impacts and Mitigation Measures.

Table 4.6-8: Exterior Noise Exposure to Nearby Roadways, 2025

Roadway Segment	2025 Without Proposed Alternative Project					2025 With Proposed Alternative Project					Difference in dBA at 100 Feet from Roadway
	Average Daily Traffic	dBA at 100 Feet From Roadway Centerline[1]	Distance from Roadway Centerline (in feet) to: 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	Average Daily Traffic	dBA at 100 Feet From Roadway Centerline	Distance from Roadway Centerline (in feet) to: 70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
North Shore Drive:											
West of Stanfield Cutoff	5,890	58.10	17	37	79	6,557	58.57	18	40	85	0.47
East of Stanfield Cutoff	8,556	59.72	22	47	102	8,556	59.72	22	47	102	0.00
Stanfield Cutoff:											
North of N. Shore Dr.	155	33.16	0	1	2	155	33.16	0	1	2	0.00
N. Shore Dr. to Big Bear Blvd.	6,975	58.83	19	41	89	7,642	59.23	20	44	94	0.40
South of Big Bear Blvd.	2,790	50.09	5	11	23	2,790	50.09	5	11	23	0.00
Big Bear Boulevard:											
West of Stanfield Cutoff	25,420	63.80	45	98	211	25,687	63.85	46	98	212	0.05
East of Stanfield Cutoff	22,444	63.26	42	90	194	22,844	63.34	42	91	196	0.08

Note:
[1]=100 feet is the assumed distance to the midpoint of a receptor rear yard.
Noise level models computed for 2006 scenarios utilized existing 2002 roadway cross-section data.
Source: Traffic data obtained from the TIA (refer to Appendix 15.3, Traffic Data, from the 2005 Final EIR).

Watercraft Noise

The Proposed Alternative Project includes the installation of a removable, floating dock with 55 boat slips on the north shore of Big Bear Lake. The 2005 Final EIR determined that 103 boat slips (as originally proposed), if multiplied by the weekend use factor of 9 percent, would add approximately nine boats per day to the daily average number of boats using the lake. All persons undertaking boating activities would be responsible for complying with rules and regulations established by the Big Bear Municipal Water District. Boating operation requirements that include speed limits, mooring and launching restrictions, and muffler requirements would serve to reduce noise impacts generated by watercraft activities. As previously stated, the Proposed Alternative Project would add fewer than nine boats to the average daily use of the Lake. Not only is this considered a nominal increase in daily boating numbers, adherence to the Water District's rules and regulations, and the Harbor and Navigational Code 654, would reduce noise impacts from watercrafts to a less than significant level. It is noted that during peak holiday and summer periods, the daily use of watercraft would significantly increase. However, compliance with the Water District's rules and regulations would reduce impacts to less than significant levels.

Level of Significance Before Mitigation
Less than significant impact.

Mitigation Measures
No mitigation is required.

Level of Significance After Mitigation
Less than significant impact.

Operational Noise – Stationary Sources

Impact Analysis
Proposed Alternative Project operation would result in stationary noise source impacts on-site. These sources would include the typical residential noise sources and activities at the nearby marina and adjacent parking lot. The potential impacts from these sources were analyzed in terms of their proximity to the nearby off-site sensitive receptors.

Residential

Development of the residential lots adjacent to existing residences located to the north (along Flicker Road), west (along Canyon Road) and east (along SR-38) would result in new sources of stationary noise typical of any residential development. Residential noise sources include children playing, pet noise, amplified music, car repair, pool and spa equipment, woodworking and home repair. Noise typically associated with residential land uses does not exceed 60dBA and usually occurs during daytime hours from 7:00 a.m. to 10:00 p.m. In addition, all residents must comply with the noise standards set forth in the County Development Code, which states that exterior noise levels in residential property shall not exceed the basic noise standard of 55 dBA between the hours of

7:00 a.m. and 10:00 p.m. and shall not exceed 45 dBA between the hours of 10:00 p.m. and 7:00 a.m. (refer to Table 4.6-4). Thus, noise impacts from the residential uses are less than significant in this regard.

Marina Facilities

The Proposed Alternative Project includes the development of a marina on Big Bear Lake and an associated parking lot and boat launch. Proposed Alternative Project revisions include a floating, removable dock with 55 boat slips (down from 103 slips). Surface parking lots generate instantaneous noise from tire squeals, trash pick-up, delivery trucks, lot sweeping, door slamming, back-up alarms, and engine start-ups. Noise would primarily remain on-site and would be temporary (during peak events). Parking lot noise can also be considered a "stationary" noise source and may occur after 10 p.m. Typical noise levels generated by parking areas are an estimated 70 dBA at 50 feet during peak events (this is an "instantaneous" or peak noise level). Parking lot noise would also be partially masked by background noise from adjacent SR-38 and other roads and typical community noise sources. Based on the distance to the nearest existing residential areas from the proposed marina parking lot, noise levels would not exceed 55 dBA during the daytime or 45 dBA at nighttime. Therefore, typical parking lot noise generated at the Proposed Alternative Project site would be below both the daytime and nighttime noise standards at the nearest existing residential uses. Thus, noise impacts from the marina facilities are less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Less than significant impact.

4.7 - Public Services

This section presents a discussion of the existing and proposed public services available to serve the Proposed Alternative Project, which has been modified from the Original Proposed Project that was described in the 2005 Final Environmental Impact Report (EIR). Public services include police and fire protection, parks, schools, and libraries.

4.7.1 - Existing Conditions

Fire Services

The County of San Bernardino Fire Department provides fire protection and emergency service to the Fawnskin area. County Fire Station No. 49 is located at 39188 Rim of the World Drive, approximately 0.75 mile west of the site. Station 49 has two permanent personnel, one of whom is a paramedic, and approximately eight to ten volunteer fire fighters. Mutual aid agreements with the City of Big Bear Lake and Big Bear City Community Services District supplement service by providing first-response in the event that additional manpower and/or equipment is needed during a fire, emergency medical call, or in the event that the Big Bear Lake or Big Bear City stations could provide first alarm response with the closest available equipment.

The private Insurance Service Organization (ISO) research group rates fire danger on a scale of 1 to 10, depending on type of vegetation, structures, climate and availability of fire protection services. The Community of Fawnskin has an ISO rating of 9, with 1 representing the lowest threat and 10 the highest.

The project site is located within San Bernardino County Fire Safety Area 1 (FS1). Since the Proposed Alternative Project is located within a FS1 designated area, it is subject to compliance with various requirements relative to construction, building separations, project design, and erosion and sediment control. The requirements applicable to each fire safety area are found in the County's Development Code in Section 82.13.050 (General Development Standards), Section 82.13.060 (FS1, FS2, and FS3 Development Standards), and 82.13.070 (FS1 Additional Development Standards). The provisions for the FS1 District apply to all phases of the Proposed Alternative Project development.

Police Services

Police protection for the Community of Fawnskin is provided by the San Bernardino County Sheriff's Department. The Big Bear Sheriff's Station is located at 477 Summit Boulevard in the City of Big Bear Lake, approximately 6 miles east of the project area. The station also provides staffing for the contract law enforcement personnel for the City of Big Bear Lake (the County Sheriff is the City's Police Department under contract with the City) and houses a Type I jail. The department has nine patrol duties, 24-hour personnel coverage of unincorporated areas, one detective and support personnel. The Big Bear Sheriff's Station serves a population of approximately 16,000 in the

unincorporated San Bernardino County areas of Big Bear Valley. The average response time for emergency calls is plus or minus 6.97 minutes.

The mountain communities in the Valley have volunteer support of law enforcement through an active Search and Rescue team, Citizen's Patrol and Neighborhood Watch Programs.

School Services

Moon Camp is within the Bear Valley Unified School District (BVUSD). The BVUSD provides public education for grades Kindergarten through 12. School facilities serving the project site, along with their enrollment and capacity, are shown in Table 4.7-1. Although one of the schools is operating beyond capacity, enrollment is declining in the elementary and middle schools. Measure Q, a local bond for $25 million to improve school facilities, recently passed. Measure Q includes projects to renovate existing facilities and to provide new classrooms to replace portable classrooms at North Shore Elementary, Big Bear Middle School and Big Bear High School. Big Bear High School has recently completed an expansion project and is no longer functioning over capacity. From 2006 to 2007, enrollment decreased at the elementary and middle school levels, yet increased for the high schools.

Table 4.7-1: Bear Valley School District Facilities

School	Grade Level	Maximum Capacity	2006 Enrollment	2007 Enrollment	Currently Impacted?
North Shore Elementary 765 N. Stanfield Cutoff	K-6	588	568	535	No
Big Bear Middle 41275 Big Bear Blvd.	7-8	408	534	436	Yes
Big Bear High [1] 351 N. Maple Lane	9-12	ND	1,026	1,038	No
Chautauqua High [2] (Alternative) 525 Maple Lane	9-12	ND	104	114	No

ND = data not available
[1] Recently expanded
[2] All portable buildings with ability to expand
Source: BVSD, personal contact.

Libraries

Big Bear Lake Branch Library serves the community from a 9,543- square-foot building located at 41930 Garstin Drive. It is one of 28 branch libraries in the County system and serves approximately 6,000 visitors per month. According to the San Bernardino County Library Facility Master Plan, the library needs to expand to 15,443 square feet. However, at present, there are no plans to expand.

Parks

The project site is located in the Community of Fawnskin. The Fawnskin area supports visitors and residents with the provisions of lodging, restaurants, boat docks, fishing, hiking, backpacking, off-roading, bicycling paths, campgrounds and picnic areas. Although the project site is privately owned and not formally in operation as public parkland, the site currently supports multiple recreational activities inline with the lakeside communities.

There are multiple recreational opportunities in the immediate vicinity. Big Bear Lake is considered a premier recreational and vacation resort area of southern California. The lake's waters are utilized by recreational boaters, as well as smaller recreational craft (jet skis, sailboats, kayaks, etc.), and fishing. Most of the recreational activities are privately owned and operated. However, the Big Bear Municipal Water District (MWD) has authority to regulate recreational activity on the lake's surface.

According to the Big Bear Municipal Water District Management Plan, dated August 3, 2000 (Revision), MWD has constructed two public boat launch ramps and improvements at the Stanfield Marsh that includes a parking, viewing location and boardwalk for public access. Additional public access to the lake is provided on property along the north shore, which is owned by the Forest Service. Also, there are 11 commercial marinas providing access to the lake. The MWD also owns and operates a recreational vehicle (RV) park adjacent to their administrative offices.

Recreational Bike Trail

The U.S. Forest Service (USFS) constructed the Alpine Pedal Path Bike Trail along the north shore of the Lake extending from Stanfield Cutoff, through the MWD East Boat Ramp, to the Solar Observatory, which is immediately to the east of the project site. Currently, the trail does not extend through the properties east of the project site, nor through the project site itself.

4.7.2 - Thresholds of Significance

The following criteria for establishing the significance of potential impacts on public services were derived from Appendix G of the California Environmental Quality Act (CEQA) guidelines. The Proposed Alternative Project would result in potentially significant impacts to public services if the following criteria are met:

a) result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services: fire protection, police protection, schools, parks, other public facilities.

4.7.3 - Project Impact Analysis

Fire Services

Wildfire is the primary safety issue in mountainous areas. Fire conditions in the San Bernardino National Forest are more dangerous than ever, according to the USFS (2006). The recent Butler II fire (September 2007) required the evacuation of the Fawnskin community for a short period. Many decades of fire suppression policy, which led to growth of the understory and bark beetle infestation, is partially to blame for this fire hazard. Implementation of the San Bernardino National Forest Plan (2006) for mechanical thinning of under-story trees and provision of fire-flow would reduce fire danger in the project area.

The project site is located adjacent to the National Forest Service on the north and east. The USFS requires a 100-foot firebreak for residential lots that are adjacent to USFS land. The Proposed Alternative Project is designed to include this 100-foot fuel modification zone adjacent to USFS land.

The project site is in a high fire hazard area and included in the County's Fire Hazard Overlay District (FS1). The FS1 Area "includes areas within the mountains and valley foothills. It includes all the land generally within the San Bernardino National Forest boundary and is characterized by areas with moderate and steep terrain and moderate to heavy fuel loading contributing to high fire hazard conditions."

Since the Proposed Alternative Project is located within a FS1 designated area, it is subject to compliance with various requirements relative to construction, building separations, project design, and erosion and sediment control. The requirements applicable to each fire safety area are found in the County's Development Code in Section 82.13.050 (General Development Standards), Section 82.13.060 (FS1, FS2, and FS3 Development Standards), and 82.13.070 (FS1 Additional Development Standards). The provisions for the FS1 District include, but are not limited to, fuel modification zones, set backs, emergency access, water supply (for fire flows), and apply to all phases of project development. For a complete list of applicable codes, see Appendix F, San Bernardino County Development Code, Fire Safety Overlay District.

Exhibit 2-5, in Section 2, *Project Description,* shows the required 100-foot fuel modification zone required for any development project that abuts USFS land. Ten of the residential lots are affected by this requirement and must abide by the Fuel Modification Plan required to be prepared for the Proposed Alternative Project. In addition, because the proposed residential lots would be sold as custom lots and would be developed as they are sold, fuel modification on individual lots may be required if a lot being developed is adjacent to other lots that have not been sold or remain undeveloped. Under this condition, Development Code Section 82.13.060(6) (B) would apply. This provision states in part that "when a development project is phased, individual phases may be required to provide temporary fuel modification areas, where the development perimeter of a phase is contiguous to a subsequent phase of a project, which in its undeveloped state is a hazardous fire area…"

The fuel modification zone adjacent to the USFS boundary and areas within the site that would be required to maintain temporary fuel modification areas will be maintained by the prospective homeowners of these specific lots. Each homeowner will be required to pay property taxes and development impact fees based on then-current rates. The project's increase in demand for fire protection services would be offset through project-related fees and taxes.

Regular thinning of these buffer zones would lessen the fire hazard. A potential loss of habitat could result from the removal of trees required for fire control. However, the County of San Bernardino requires under Chapter 88.01, Plant Protection and Management, of the Development Code that development on all private and public lands within the unincorporated areas of San Bernardino County is subject to specific requirements. Removal of any native plant from unincorporated areas of San Bernardino requires the approval of a removal permit. The Proposed Alternative Project would comply with this Plant Protection and Management Ordinance and the design standards specific for high fire areas.

Related to this issue, a Water Supply Feasibility Study (Appendix G) was prepared for the Proposed Alternative Project that addresses both domestic water supply and water supply for fire flow. As part of the permitting process, the Applicant must provide adequate domestic water supply as well as meet the fire flow requirements established by the County Fire Marshall. Storage capacity for the development would be sized to meet the operational, emergency and fire flow storage requirements. Operational storage would be used to meet the hourly fluctuations in demand during maximum day conditions, and must be established as 30 percent of maximum day. Emergency storage would be used to meet demands during a power outage or other emergency situation when supply sources and boosting pumps may not be available. The requirements for emergency storage are equivalent to one day of maximum day demand. Fire-flow storage capacity would be equal to the fire-flow capacity of 1,750 gallons per minute (gpm) times its duration (2 hours). Fire-flow storage for 1,750 gpm (based on 120 minutes) is 210,000 gallons (see Section 4.9, Utilities, for this discussion). According to the Water Supply Feasibility Study, the Proposed Alternative Project would have sufficient water to meet these requirements. In addition, mitigation measures pertaining to fire protection are included to address the potential fuels- and fire-related impacts of the Proposed Alternative Project. Implementation of these mitigation measures will ensure that fire protection impacts of the Proposed Alternative Project are less than significant.

Emergency Evacuation

The project site is currently vacant; therefore, implementation of the Proposed Alternative Project would increase the demand for fire protection in the area and increase the probability of additional calls for service. The average household size in Big Bear Valley has been estimated to be 2.31 persons. Therefore, at full build-out of the 50 residential lots, the Fawnskin population has the potential to increase by approximately 116 persons, assuming that all residences are occupied full

time, that would require evacuation, in the event of an emergency (currently, Big Bear Valley experiences one third permanent occupancy and two thirds part time, vacation occupancy).

The project site is located adjacent to State Route 38 (SR-38), which serves as the evacuation route for the Fawnskin Community. At this location on SR-38, Fawnskin residents can evacuate the Community (at the direction of the County Sheriff) to the west by going directly west on SR-38 towards Big Bear Dam and then west on SR-18 to Running Springs and onward to San Bernardino and Interstate 210 (I-210). If the Fawnskin residents are directed to evacuate to the east, they travel on SR-38 to the east. As they pass through Big Bear City on SR-38, they can leave the Valley either to the northeast on State Highway 18 to Lucerne Valley, Victorville and I-15, or to the Southeast on SR-38 to Redlands and I-10. There are three two-lane State Highways providing access into and out of Big Bear Valley.

The County of San Bernardino has proactively worked to provide efficient emergency response and an emergency evacuation plan to protect residents and visitors to the Big Bear Valley. The efforts of the County include providing regulations for property owners to reduce the potential for wildfires, coordination with other jurisdictions in the Big Bear Valley to provide emergency response, and an emergency evacuation plan that includes notification of local media and a reverse 911 system.

The County has enacted several ordinances and regulations in order to proactively work to reduce emergency situations such as wildfires. These regulations include weed abatement requirements and property maintenance standards. Weed abatement requirements and property maintenance standards reduce the amount of fuel that is located adjacent to houses, reducing the risk to structures and humans from wildfire. In addition, fuel reduction of plants, trees, and shrubs along major roads (such as SR-38 and SR-18) has been an ongoing process in coordination with the USFS.

The San Bernardino County Operational Area Coordination Council (SBCOACC) consists of 24 cities and towns that meet on a quarterly basis to discuss emergency preparedness in San Bernardino County. The Council has access to resources from all members, including the County and City of Big Bear Lake. Member jurisdictions of the Council coordinate with one another to provide aid in the event of an emergency.

Other participants in interagency planning and cooperation include the USFS, Natural Resources Conservation Service (NRCS), CALFIRE, California Department of Transportation (Caltrans) California Highway Patrol (CHP), San Bernardino County Fire Department, San Bernardino County Roads, San Bernardino County Sheriff, Big Bear Lake Fire Department, Big Bear City Fire Department, and other local fire departments.

The County has adopted an Emergency Operations Plan for all types of disasters, including snowstorms, earthquakes, and fires. This Plan incorporates policies and procedures to care for full-time residents and visitors in a time of disaster. Depending upon the situation or disaster, citizens and

visitors would be instructed on the appropriate action to take. Instructions can be disseminated by a wide array of options. The San Bernardino County Telephone Emergency Notification System (TENS) provides for recorded messages to be sent to all standard telephones in the Big Bear Valley in a reverse 911 system. KBHR 93.3 FM radio and TV6, in addition to their normal emergency broadcasts, have agreed to participate in sending out messages. In addition, a siren system has been installed in the City of Big Bear Lake and can be utilized in the event of an emergency. Scan USA, which is a web-based emergency notification system, sends out locally generated messages by email, telephone, text messaging, and cell phone for individuals that sign up for the service.

With respect to an evacuation, the Emergency Operations Plan allows for conservative trigger points to be established when calling for voluntary and mandatory evacuations. The County has not released the Plan, as doing so could jeopardize security, and therefore the Plan cannot be attached as an Appendix to this Revised and Recirculated Draft EIR. However, the County has an approved evacuation plan, and it would be implemented in the event of an emergency.

The Big Bear Valley Mutual Aid Association provides public outreach to educate the public for preparedness in the event of an emergency. The County and City provide additional disaster education to residents of the Big Bear Valley through presentations at elementary and pre-schools for earthquake and fire preparedness, open houses at the fire station, press releases to the media, and active participation in community activities to provide awareness for residents. In addition, the County, City and Community Services District through Mountain Mutual Aid have conducted disaster drills, which included all local agencies, public service organizations and utilities.

In summary, the County has an approved Emergency Operations Plan, and strict development standards will be applied to the Proposed Alternative Project. The County and City Emergency Services Agencies have an Evacuation Plan for the Big Bear Valley that has been used successfully in the past and the addition of the 50-lot Proposed Alternative Project will not have a significant impact on the evacuation of Big Bear Valley. The Proposed Alternative Project is subject to compliance with various requirements relative to construction, building separations, project design, and erosion and sediment control, including regulations on fire flows. The Water Feasibility Study has determined that there is sufficient water available to meet the requirements for the FS1 Overlay District Overlay (Section 82.13.060 of the Development Code). In addition, the Proposed Alternative Project design includes adequate fuel modification zones that will reduce the risk of wildfire associated with the adjacent National Forest. Furthermore, the individual homeowners will be required to pay development impact fees, a portion of which are directed to fire protection services. Therefore, impacts to fire services and emergency evacuation will be less than significant, and no mitigation measures are recommended.

Police Services

As with any new residential development, implementation of the Proposed Alternative Project would increase police service calls to the vicinity beyond existing conditions. This would be a direct result

of the addition of 50 single-family residences and associated population. The average household size has been estimated to be 2.31 persons; therefore, at full build-out of the 50 residential lots, the Fawnskin population has the potential to increase by approximately 116 persons. This increase in population would incrementally increase the number of police service calls.

Anticipated police calls that may occur include increased burglar alarm calls, general criminal investigations, missing or lost persons, emergency medical calls, thefts of boats, and vandalism. Although there would be an incremental need for increased police service, it is not anticipated that Proposed Alternative Project implementation would require any new police facilities. Each homeowner will be required to pay property taxes and development impact fees based on then-current rates. The Proposed Alternative Project's increase in demand for police services would be offset through project related fees and taxes. Therefore, impacts to law enforcement services are expected to be less than significant, and no mitigation measures are proposed.

School Services

Development of the Proposed Alternative Project could generate an increased student population of approximately 11 students (based on 0.21 students per unit times 50 units) within the BVUSD. This is less than one student per grade. As noted in Table 4.7-1, the middle school is over capacity. All of the schools have augmented existing facilities with portable classrooms to accommodate over-crowding, and the local electorate recently passed Measure Q to build new classrooms and/or improve facilities at all of the BVUSD schools that could be affected by this Proposed Alternative Project. In addition, both the elementary and middle schools have experienced a decline in enrollment.

Currently, the BVUSD collects development impact fees from new development projects within the service district boundaries. The fees are determined by a Developer Justification Study commissioned by the District every 2 years. Each homeowner will be required to pay these development impact fees, regardless of whether or not they will have students in the BVUSD. Payment of these fees are considered full mitigation under the CEQA Guidelines. Therefore, the impacts to school services would be less than significant, and no mitigation is proposed.

Libraries

Big Bear Lake Branch Library serves the community from a 9,543-square-foot building located at 41930 Garstin Drive. It is one of 28 branch libraries in the County system and serves approximately 6,000 visitors per month. According to the San Bernardino County Library Facility Master Plan, the library needs to expand to 15,443 square feet. However, at present, there are no plans to expand.

The Proposed Alternative Project would add an additional 116 residents to the Fawnskin community, and these additional residents would place an incremental demand on public libraries primarily the Big Bear Lake Branch Library. The increase in population could necessitate a proportionate increase in staffing, resources, materials and library space. The demand for library services has decreased because of the internet (i.e., online publications). The current state average is 0.35 square feet of

library space per capita. However, the Division of Library Development Services of the State of California recommends up to 0.5 square feet of space per capita. The Big Bear Lake Branch Library is currently impacted and in need of expansion. According to the San Bernardino County Library Facility Master Plan, the library needs to expand to 15,443 square feet. However, at present, there are no plans to expand.

The individual homeowners will pay property taxes, of which a portion will go toward funding library services. The revenue from property taxes would offset the incremental cost of providing services to the project residents. Furthermore, modern technology (computers) has reduced the need for library services. The impacts to library services are expected to be less than significant and no mitigation is required.

Parks

The Proposed Alternative Project would add an additional 116 residents to the Fawnskin community, and these additional residents would place an incremental demand on public parks. With implementation of the Proposed Alternative Project, the existing unauthorized trails and dirt roads on site would be eliminated. However, these features are on private property and could be blocked from public use at any time. An area for Neighborhood Lake Access (Lot B) will be included in the development plan that will be accessible by foot and bicycle. In addition, the Applicant intends to dedicate a 66-foot-wide road easement for SR-38 that would accommodate an extension of the multipurpose trail that runs along the north shore of the lake. Furthermore, the mountain community has multiple recreational facilities, both public and private, and Big Bear Lake has multiple access points that will remain accessible to the general population.

Summary of Impacts

The Proposed Alternative Project will result in less than significant impacts on police services, schools, and libraries, because project-related fees and property taxes would offset the additional demand for police services, schools, and libraries. The project would have sufficient water to meet fire flow requirements and the County's Emergency Operations Plan would provide guidance in the event of an emergency evacuation. Furthermore, implementation of mitigation measures pertaining to fire protection would ensure that fuels- and fire-related impacts associated with the Proposed Alternative Project would be less than significant.

4.7.4 - Standard Conditions and Uniform Codes

Fire Services

The County requires that all land use proposals, including subdivisions, site plans, and use permits, be consistent with Uniform Fire Code and other site design requirements relative to fire safety such as water supply, fire hydrant number and location, etc. The project site is located within San Bernardino County Fire Safety Area 1 (FS1). Since the Proposed Alternative Project is located within a FS1 designated area, it is subject to compliance with various requirements relative to construction,

building separations, project design, and erosion and sediment control. The requirements applicable to each fire safety area are found in the County's Development Code in Section 82.13.050 (General Development Standards), Section 82.13.060 (FS1, FS2, and FS3 Development Standards), and 82.13.070 (FS1 Additional Development Standards). The provisions for the FS1 District include fuel modification zones, and apply to all phases of project development. The individual homeowners will be required to pay development impact fees, a portion of which are directed to fire protection services.

Police Services

The individual homeowners will be required to pay development impact fees, a portion of which are directed to law enforcement services. In addition, the Police Department reviews development plans to make sure they provide "defensible space" (e.g., areas visible at night to patrolling officers, unit numbers readily visible, etc.).

School Services

The individual homeowners will be required to pay development impact fees to the BVUSD. These fees are considered full mitigation under CEQA Guidelines. Service levels and needs for additional staff or school facilities are determined by the CJUSD as development is proposed.

Libraries

Other than payment of property taxes, there are no Standard Conditions and Uniform Codes that pertain to library services.

Parks

There are no Standard Conditions and Uniform Codes that pertain to park services.

4.7.5 - Project Design Features

Fire Services

The Proposed Alternative Project would have two public access points (Street A and Street B) on the north side of SR-38 that connect to the residences, and one emergency access point at the easterly terminus of Street A. In addition, there are two points of access to the marina parking lot south of SR-38. From these access points, residents would follow the San Bernardino County emergency evacuation procedures for the Big Bear Valley, as discussed in the Emergency Evacuation section (above). Therefore, the Proposed Alternative Project will allow emergency vehicles unrestricted access to project site. The Proposed Alternative Project also has a water feasibility study and the Applicant must install a network of water mains and fire hydrants to protect the site, prior to development of any individual home sites. Residences and related structures will be constructed out of fire resistant materials as required by the County's development code.

Police Services

The Proposed Alternative Project has a circulation master plan that provides emergency access, and that also incorporate principles of "defensible space."

School Services

There are no design features of the Proposed Alternative Project that specifically address school services or facilities other than the payment of development impact fees, which are required of all new development.

Libraries

There are no design features of the Proposed Alternative Project that specifically address library services or facilities, other than the payment of development impact fees, which are required of all new development

Parks

The Proposed Alternative Project includes an area for Neighborhood Lake Access (Lot B) that will be accessible by foot and bicycle, a dock with 55 boat slips, and will provide a 66-foot-wide road easement for SR-38 that allows for the future extension of the Alpine Pedal Path Bike Trail.

4.7.6 - Mitigation Measures

The following mitigation measures pertaining to fire protection would apply to the Proposed Alternative Project.

Fire Protection

PS-1 The fire flow requirement shall be 1750 gpm at 2 hours based on homes in the range of 3,600 to 4,800 square feet, and 2,000 gpm at 2 hours for homes greater than 4,800 square feet.

PS-2 All residences less than 5,000 square feet shall be subject to the standard fire sprinkler requirement (NFPA 13D). Homes above 5,000 square feet shall be subject to the NFPA13R sprinkler requirement.

PS-3 A Fuels Management Plan, with specifications, shall be prepared and subject to approval by the County of San Bernardino Fire Department and San Bernardino National Forest Service. The Fuels Management Plan shall implement the fire safety requirements of the FS1 Fire Safety Overlay District, including a 100-foot minimum setback requirement from the National Forest. The fuel modification zone shall be located entirely within the project boundaries. The minimum fuel modification zone requirements may be greater in steeper areas (up to 300 feet), as determined by the Fire Department.

PS-4 A Homeowner's Association shall be established to implement the Fuels Management Plan. The Fuels Management Plan shall specify any professional assistance, if necessary, to implement the action portion of the Plan. The Plan shall determine if a Registered Professional Forester is necessary for professional guidance to implement the Plan. The HOA is to be responsible for fuel modification in common areas.

Police Protection

No mitigation measures are recommended.

Schools

No mitigation measures are recommended.

Libraries

No mitigation measures are recommended.

4.7.7 - Level of Significance after Mitigation

With the implementation of appropriate Development Code, design features, Emergency Operations Plan, Mitigation Measures and payment of development impact fees, the Proposed Alternative Project-related impacts on public services would be less than significant.

4.8 - Transportation, Circulation, and Parking

This report summarizes the Moon Camp Traffic Analysis (April 2007) and the Revised Traffic Study for the Moon Camp Project (June 2007), both of which were prepared by Urban Crossroads (Appendix E), to assess the potential impacts of the Moon Camp Proposed Alternative Project on the roadway system in the study area. The proposed development is generally located along North Shore Drive in the County of San Bernardino. The Proposed Alternative Project would include 50 new single-family detached dwelling units and seven lettered lots on approximately 62.43 acres.

In conformance with the requirements of the San Bernardino County Congestion Management Program (CMP), the Proposed Alternative Project does not require a CMP traffic study. The CMP requires no analysis for projects generating less than 250 peak hour trips. The Proposed Alternative Project would generate approximately 51 trips during the AM peak hour and 51 trips during the PM peak hours; which is fewer than the required threshold for a CMP traffic study. However, per discussion with County staff, the traffic study should follow CMP guidelines and a long-range traffic analysis is required.

Proposed Alternative Project Overview

The proposed Moon Camp residential development is generally located north of North Shore Drive, south of Flicker Road and east of Canyon Road in San Bernardino County. The Proposed Alternative Project would include 50 new single-family detached dwelling units and seven lettered lots, of which one would be designated as Pebble Plain Habitat and Open Space/Conservation (4.91 acres), one would be designated as Open Space/Neighborhood Lake Access (0.82 acre with 891 lineal feet of lakefront access), one would be developed as the marina parking lot with a boat ramp for a 55-slip private boat marina, three are the existing well sites, and one is a potential reservoir site. There are two (2) primary full access points to the Proposed Alternative Project site located off North Shore Drive.

Study Area

The overall study area evaluated in the TIA is presented in Exhibit 4.8-1. Based on discussions with County transportation staff, the study area includes the following existing study intersections:

Stanfield Cutoff (NS) at:

- North Shore Drive (SR-38) (EW)
- Big Bear Boulevard (SR-18) (EW)

North Shore Drive (SR-38) (NS) at:

- Big Bear Boulevard (SR-18) (EW)

Traffic Study Methodology

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with the San Bernardino County CMP. The following analysis years are considered in this report:

- Existing Conditions – 2007.
- Interim Year – 2010.
- Long Range – 2030.

The overall methodologies used to develop future traffic volume forecasts, and the explicit traffic operations analysis methodologies are summarized herein and further discussed in the Traffic Impact Assessment (TIA).

Overall Analysis Methodology

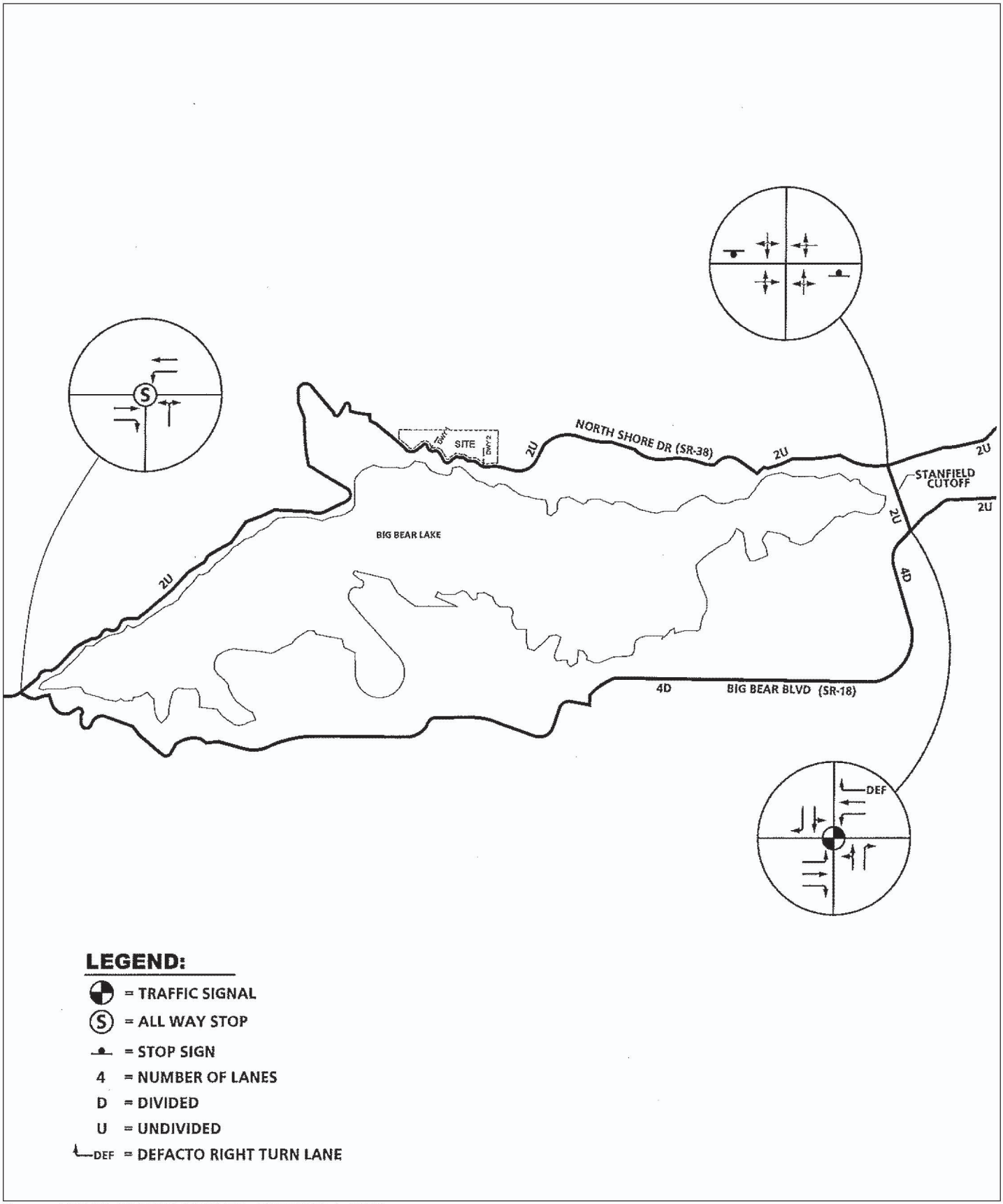
As stated previously, traffic conditions were evaluated for existing conditions, 2010 Interim Year Without Project conditions, 2010 Interim Year With Project conditions, and Long Range General Plan Buildout (2030) conditions.

Actual traffic count data was obtained from manual intersection counts (conducted in March 2007, refer to Appendix "A" of the TIA that is included in Appendix E of this Revised and Recirculated Draft EIR) to quantify existing traffic conditions. Per discussion with County staff, the peak season of the study area occurs during the summer months, thus a 16 percent growth is applied to manual intersection counts to represent existing peak hour intersection volumes.

Interim Year conditions have been estimated based on area-wide growth (other projects that are approved, pending, or under construction) and the addition of the Proposed Alternative Project related peak hour volumes. An area-wide growth of 2 percent per year is applied to adjusted existing volumes (with 16 percent growth).

The Interim Year 2010 without project traffic volumes are estimated based on the 2007 existing traffic volumes (with 16 percent adjustment) plus the 2007 to 2010 background growth volumes (2 percent) plus the known cumulative development volumes.

Project traffic volumes for all future conditions were estimated using the manual approach described in the CMP guidelines. The trip generation calculation is based on the most recent "Institute of Transportation Engineers Trip Generation Rates," 7th Edition. The project trip distribution was developed from a select zone run of the "San Bernardino Mountain Model" and was reviewed by the County of San Bernardino staff. The project only traffic forecasts have been generated by applying the trip generation, distribution and traffic assignment calculations, as shown in Tables 4.8-1 and 4.8-2.



Source: URBAN CROSSROADS TIA, EXHIBIT 3-A, 2007.

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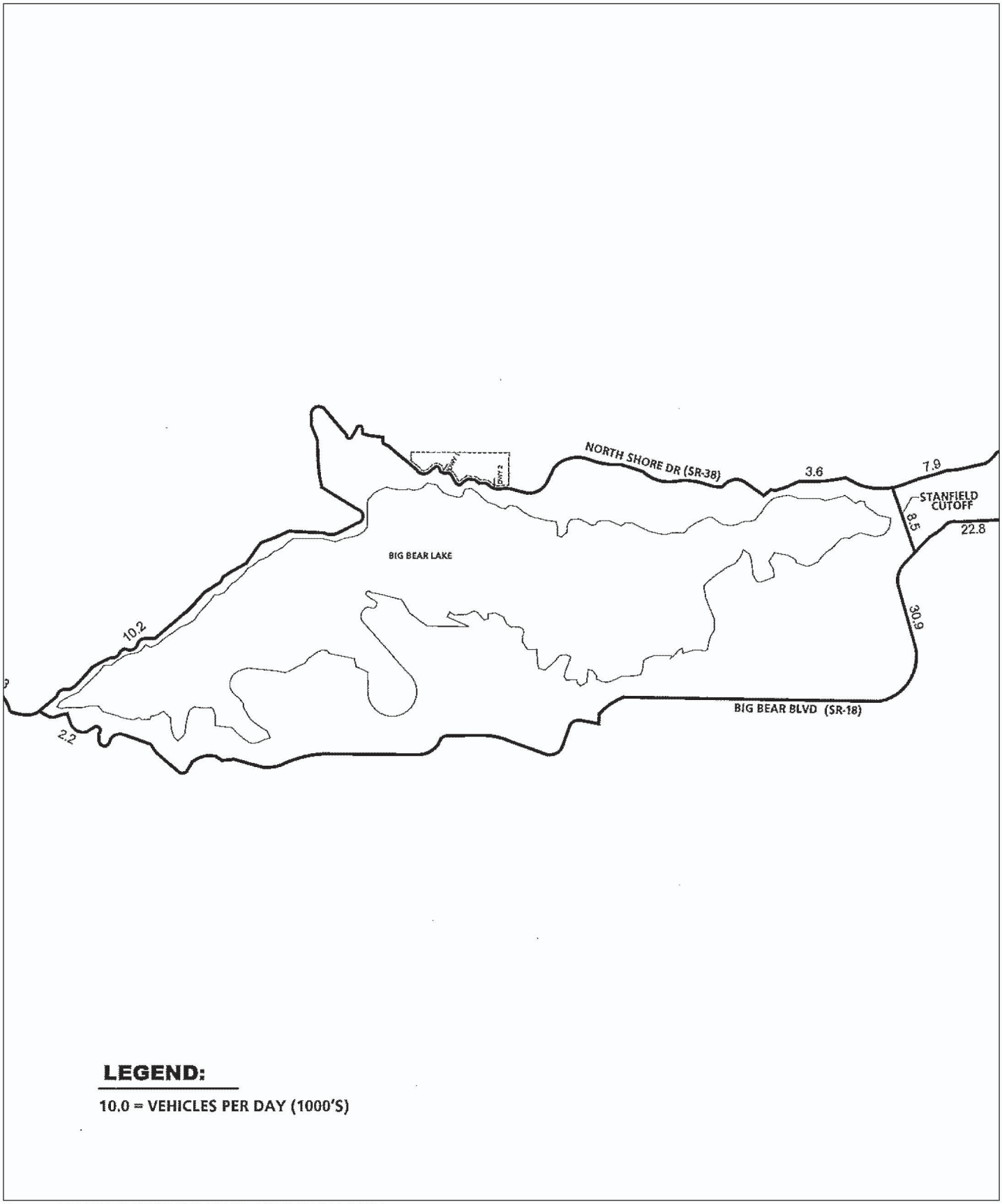
Exhibit 4.8-1
Existing Through Lanes and Intersection Controls



Source: URBAN CROSSROADS TIA, EXHIBIT 3-B, 2007.

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Exhibit 4.8-2
Existing Friday Average Daily Traffic (ADT)

Table 4.8-1: Moon Camp Proposed Alternative Project Trip Generation Rates

Trip Rate/Land Use	AM Peak Hour			PM Peak Hour			Total Daily Trips
	In	Out	Total	In	Out	Total	
PROJECT – 50 DU							
Single Family Residential	0.64	0.37	1.01	0.64	0.37	1.01	9.57
CUMULATIVE PROJECTS							
Hotel	0.31	0.28	0.59	0.31	0.28	0.59	8.17
Townhomes / Condominiums	0.35	0.17	0.52	0.35	0.17	0.52	5.86
Fast Food with drive through	18.01	16.63	34.64	18.01	16.63	34.64	496.12
Shopping Center	6.57	7.12	13.70	6.57	7.12	13.70	152.03
Shopping Center	4.99	5.4	10.39	4.99	5.4	10.39	114.43
Automobile Care Center	1.69	1.69	3.38	1.69	1.69	3.38	20.00
Mini-warehouse	1.99	1.84	3.83	1.99	1.84	3.83	38.87
Office	0.17	0.83	1.00	0.17	0.83	1.00	11.01
Church	0.34	0.32	0.66	0.34	0.32	0.66	9.11
Source: Urban Crossroads (Moon Camp Traffic Analysis, County of San Bernardino, California, April 24, 2007).							

Long Range General Plan Buildout (2030) conditions have been estimated based on the San Bernardino Mountain Model and the addition of both the Proposed Alternative Project related peak hour volumes and the known cumulative development peak hour volumes per discussions with County staff.

Proposed Alternative Project traffic volumes for all future conditions were estimated using the manual approach. Trip generation has been estimated based on data collected by the Institute of Transportation Engineers (ITE). The Proposed Alternative Project trip distribution was derived from a select zone run of the San Bernardino Mountain Model.

Table 4.8-2: Summary of Moon Camp Proposed Alternative Project Trip Generation

Land Use	Quantity	Units	Friday Pm Peak Hour In - Out - Total			Sunday Mid-Day Peak Hour In - Out - Total			Daily
Single Family Residential	50	DU	32	19	51	32	19	51	479

Traffic Operations Analysis

The current technical guide to the evaluation of traffic operations is the "2000 Highway Capacity Manual" (HCM) (Transportation Research Board Special Report 209). The HCM defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS (Level of Service) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted. The definitions of level of service for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- LOS "A" represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.
- LOS "B" is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.
- LOS "C" is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.
- LOS "D" represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.
- LOS "E" represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.
- LOS "F" is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

Uninterrupted flow is generally found only on limited access (freeway) facilities in urban areas. The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control.

The level of service is typically dependent on the quality of traffic flow at the intersections along a roadway. The HCM methodology expresses the level of service at an intersection in terms of delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control. The LOS determined in this study are calculated using the HCM methodology.

For signalized intersections, average total delay per vehicle for the overall intersection is used to determine LOS. LOS at signalized study intersections have been evaluated using a HCM intersection analysis program.

The study area intersections which are stop sign controlled with stop-control on the minor street only have been analyzed using the two-way stop controlled unsignalized intersection analysis methodology of the HCM. For these intersections, the calculation of level of service is dependent on the occurrence of gaps occurring in the traffic flow of the main street. Using data collected describing the intersection configuration and traffic volumes at these locations to calculate average intersection delay; the level of service has been calculated. The LOS criteria for this type of intersection analysis is based on total delay per vehicle for the worst minor street movement(s)

The six qualitative categories of Level of Service, LOS (A through F), which are standard for California, have been defined for the project area along with the corresponding delay range as measured in seconds, as shown in Table 4.8-3. The peak weekday hours selected for this analysis are 7 to 9 AM (morning or AM peak) and 4 to 6 PM (afternoon or PM peak).

Table 4.8-3: Level of Service Definitions

Level of Service (LOS)	Description	Average Total Delay Per Vehicle (seconds)	
		Signalized	Unsignalized
A	Occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 – 10.00	0 - 10.00
B	Occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average total delay.	10.01 - 20.00	10.01 - 15.00
C	Generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level, although many still pass through the intersection without stopping.	20.01 - 35.00	15.01 - 25.00
D	Generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.01 - 55.00	25.01 - 35.00
E	Considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.01 - 80.00	35.01 - 50.00

Table 4.8 3 (cont.): Level of Service Definitions

Level of Service (LOS)	Description	Average Total Delay Per Vehicle (seconds)	
		Signalized	Unsignalized
F	Considered to be unacceptable to most drivers. This condition often occurs with over-saturation (i.e., when arrive flow rates exceed the capacity of the intersection). It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.01 and up	50.01 and up
Source: Highway Capacity Manual, 2000.			

Definition of Deficiency

County of San Bernardino guidelines indicate that peak hour intersection operations of LOS "C" or better are considered acceptable. Therefore, any intersection operating at LOS "D" or worse is considered deficient. Per CMP direction, state controlled facilities (state highways, freeway ramp intersection, etc.) are subject to local jurisdiction (California Department of Transportation) traffic operations requirements, with no greater than 45 seconds average stopped delay per vehicle allowed during peak hour operations (middle of LOS "D").

The identification of a CMP deficiency requires further analysis in satisfaction of CMP and County requirements, including:

- Evaluation of the mitigation measures required to restore traffic operations to an acceptable level of service with respect to CMP and local jurisdiction LOS standards.
- Calculation of the Proposed Alternative Project share of new traffic on the impacted CMP facility during peak hours of traffic.
- Estimation of the cost required to implement the improvements required to restore traffic operations to an acceptable level of service as described above.

Definition of a Significant Impact

The identification of significant impacts is a requirement of California Environmental Quality Act (CEQA) and is not directly addressed in the CMP document. The County of San Bernardino General Plan and Circulation Element have been adopted in accordance with CEQA requirements, and any roadway improvements within the County of San Bernardino which are consistent with these documents are not considered a significant impact, so long as the Proposed Alternative Project contributes its "fair share" funding for improvements.

A traffic impact is considered significant and immitigable if a project both:

i) Contributes measurable to traffic; and

ii) Substantially and adversely changes the LOS at any off-site location projected to experience deficient operations under foreseeable cumulative conditions, where feasible improvements consistent with the County of San Bernardino General Plan cannot be constructed.

4.8.1 - Existing Conditions

This section summarizes existing roadway and traffic conditions in the study area. All analysis locations which exist today have been analyzed. The number of through travel lanes for existing roadways and intersection controls are presented, along with existing traffic count data collected for this study. This data was used to analyze existing traffic operations in the study area. Existing plans for roadway improvements are also described in this section.

Existing Roadway System and Daily Traffic Volumes

The number of through travel lanes for existing roadways and existing intersection controls within the study area are presented in Exhibit 4.8-1.

Exhibits 4.8-2 and 4.8-3 depict the current average daily traffic (ADT) volumes in the study area on Friday and Sunday, respectively. Existing ADT volumes are estimated based upon the latest traffic data collected by Urban Crossroads, Inc. (refer to E of this Revised and Recirculated Draft EIR). Peak hour data has been used to estimate the average daily traffic volumes on each leg using the following formula:

- Peak Hour (Approach Volume + Exit Volume) x 12 = Leg Volume.
- Regional access to the site is provided by North Shore Drive (SR-38)

Existing Peak Hour Traffic Volumes

Actual traffic count data was obtained from manual intersection counts (March 2007, see Appendix E) to quantify existing traffic conditions. The Friday PM peak hour traffic volumes were determined by counting the two hour period between 4:00 PM- 6:00 PM in the evening. The Sunday mid-day peak hour traffic volumes were identified by counting the two hour period from 12:00 PM – 2:00 PM. Per discussions with County staff, since the peak season of the study area occurs during the summer months, a 16 percent growth is applied to the manual intersection counts to represent existing peak hour intersection volumes.

Existing intersection level of service calculations are based upon the adjusted manual Friday PM and Sunday mid-day peak hour turning movement counts, as shown in Exhibits 4.8-4 and 4.8-5.

Based on the traffic study data, the LOS and estimated delay times at the local area intersections for both the morning (AM) and afternoon (PM) peak hours are currently below the standards (refer to Appendix E).

Existing Traffic Operations

Existing peak hour traffic operations have been evaluated for both the Friday PM and Sunday mid-day peak hours of traffic throughout the study area. The results of this analysis are summarized in Table 4.8-4, along with geometrics and control devices at each analysis location. As indicated in Table 4.8-4, the following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday mid-day peak hours:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

The operations analysis worksheets for existing conditions are included in Appendix "B" of the TIA.

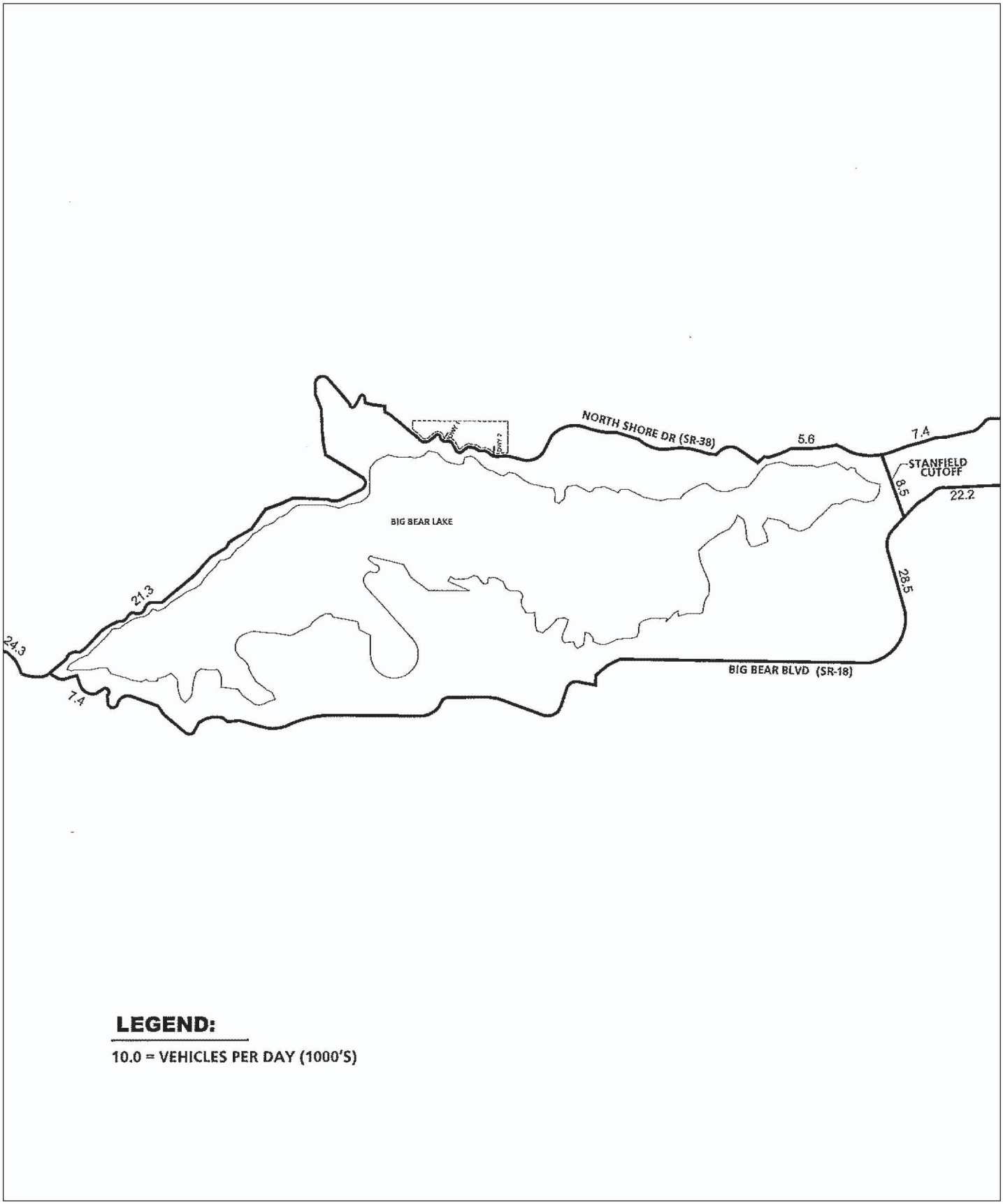
Traffic signal warrant analysis (included in Appendix "D" of the TIA) has been conducted for existing conditions and traffic signals are currently warranted at the following study area intersections:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)



Source: URBAN CROSSROADS TIA, EXHIBIT 3-C, 2007.

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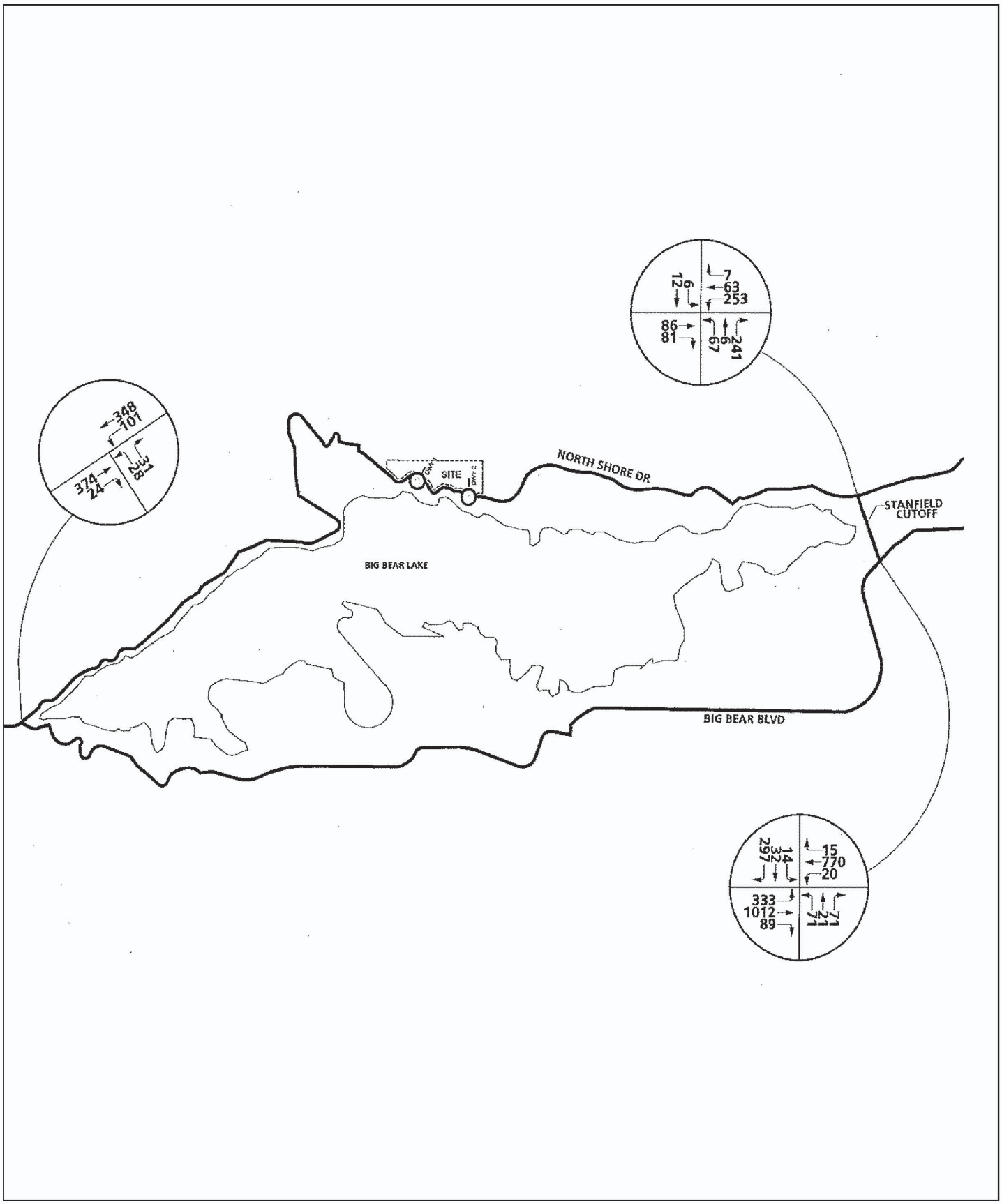
Exhibit 4.8-3
Existing Sunday Average Daily Traffic (ADT)



Source: URBAN CROSSROADS TIA, EXHIBIT 3-D, 2007.

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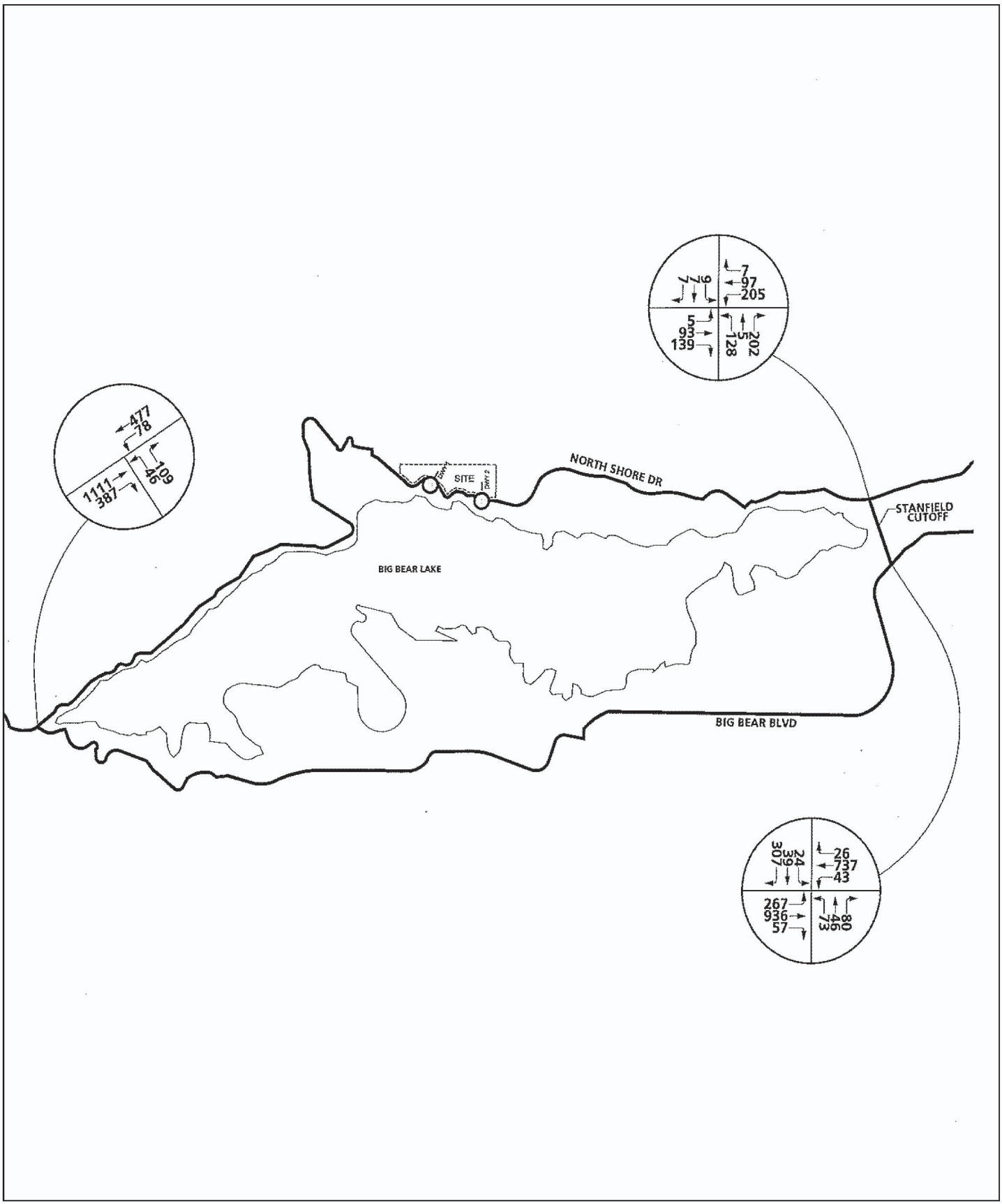
Exhibit 4.8-4
Existing Friday PM Peak Hour Intersection Volumes



Source: URBAN CROSSROADS TIA, EXHIBIT 3-E, 2007.

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Exhibit 4.8-5
Existing Sunday Mid-Day Peak Hour Intersection Volumes

Table 4.8-4: Local Intersection Conditions

Intersection	Traffic Control*	Seconds of Delay		Level of Service	
		Friday PM	Sunday MD	Friday PM Peak	Sunday MD Peak
North Shore Dr. (SR-38) at: Big Bear Blvd.(SR-18)(EW)	CSS	22.5	--	C	F
Stanfield Cutoff (NS) at: North Shore Dr. (SR-38)(EW)	CSS	25.5	34.5	D	D
Stanfield Cutoff (NS) at: Big Bear Blvd. (SR-18)(EW)	TS	--	81.1	F	F
TS = Traffic Signal; CSS = Cross Street Stop; MD = mid-day -- = Delay High, Intersection Unstable, Level of Service "F"					
Source: Urban Crossroads (Moon Camp Traffic Analysis, County of San Bernardino, California, 2007).					

Parking

There is currently no parking provided within the project site, as it is unimproved except for State Route 38 (SR-38).

Mass Transit and Railroad Service

There is currently no mass transit or rail service provided within the project site, as it is unimproved except for SR-38.

Scoping Meeting Comments

The following public comments regarding traffic were provided during the March 31, 2007, scoping meeting:

Discuss emergency access to the property. Emergency access to the property would be via Northshore Drive (SR-38) from the east or west. Interior circulation roads would provide access to all parts of the Proposed Alternative Project. Since there are no residences proposed along SR-38, emergency access through the property would be unencumbered.

Address emergency evacuation plan for the site and how it will integrate with the existing plan for the community. Emergency evacuation would occur via SR-38 and would be consistent with the existing plan for the community.

Will/Can the 80 foot easement along the existing Highway be used for a trail? Can it be used as a designated Class II bikeway? See recommended Proposed Alternative Project Design Features for Traffic in this Section.

Address project traffic on existing roads. Does the project trigger the need for turning lanes into existing streets? Particularly at Canyon Road and Highway 18. Residents do not want a traffic signal. Traffic impacts and recommended improvements both on and off site are discussed in this Section.

Will bikeway go through the existing neighborhood? The Proposed Alternative Project would provide the right-of-way that would allow a bikeway to follow Northshore Drive (SR-38).

The following criteria for establishing the significance of potential impacts on transportation and circulation were derived from Appendix G of the CEQA Guidelines. A significant impact would occur if the Proposed Alternative Project would:

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).

b) Exceeds, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.

c) Result in a change in traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment).

e) Result in inadequate emergency access.

f) Result in inadequate parking capacity.

g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

4.8.2 - Project Impact Analysis

The following paragraphs describe the development of the future year traffic volume forecasts and present the resulting daily traffic volumes which were used for traffic operations analysis. Future traffic conditions without the Proposed Alternative Project are presented first, followed by the future with Proposed Alternative Project traffic volumes. Traffic signal warrant analysis for future conditions has also been presented in this section.

Based on discussions with County staff, the areawide growth was interpolated from adjusted existing volumes (with 16 percent growth) to General Plan Buildout (2030) volumes. The area-wide growth varies for each movement at each intersection (see Appendix "D" of the TIA). The interpolated area-wide growth rate was added to peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the Proposed Alternative Project and other development.

Long Range General Plan Buildout (2030) conditions were estimated based on a select zone run of the San Bernardino Mountain Model, in addition to traffic generated by the Proposed Alternative Project and the known cumulative development.

The County of San Bernardino was contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on information given by the County of San Bernardino and City of Big Bear staff, a total of 17 cumulative projects were identified that could affect the study intersections. The location of each of these other developments is shown in Exhibits 4.8-6 and 4.8-7A (Exhibit 4-A of the TIA).

As indicated in Table 4.8-3, other developments are projected to generate 15,111 trip-ends per day with 1,455 vehicles per hour during the AM peak hour and 1,455 vehicles per hour during the PM peak hour. Based on the identified trip distribution for the other development on arterial highways throughout the study area, other development ADT and Friday PM/Sunday mid-day peak hour intersection turning movement volumes (based on PM peak hour trip generation) are shown on Exhibits 4.8-7A and 4.8-7B (Exhibits 4-B and 4-C of the TIA), respectively.

Table 4.8-5: Friday PM Peak Hours/Sunday Mid-day Peak Hour
Other Development Trip Generation

Id #	Project Name	Land Use	Quantity	Units	Peak Hour						
					Friday PM			Sunday Mid-day			Daily
					In	Out	Total	In	Out	Total	
San Bernardino County											
1	TT 16771	SFR	242	DU	155	90	245	155	90	245	2.316
2	TT 16934	SFR	228	DU	146	84	230	146	84	230	2,182
3	TT 17217 &TT17022	SFR	53	DU	34	20	54	34	20	54	607
4	TT 16036	SFR	116	DU	74	43	117	74	43	117	1,110
5	TT 14916	SFR	51	DU	33	19	52	33	19	52	488
6	TT 16980	SFR	15	DU	10	6	16	10	6	16	144
7	TT 1776H	SFR	10	DU	6	4	10	6	4	10	98
8	TT 16749	SFR	86	DU	55	32	87	55	32	87	823
9	TT 17201	SFR	66	DU	42	24	66	42	24	66	632
	TOTAL (CO. OF SAN BERNARDINO)				**556**	**322**	**877**	**555**	**322**	**877**	**8,298**
CITY OF BIG BEAR											
10	Hilton Garden Inn	Hotel	91	Rooms	28	25	63	28	25	53	743

Table 4.8 5 (cont.): Friday PM Peak Hours/Sunday Midday Peak Hour
Other Development Trip Generation

Id #	Project Name	Land Use	Quantity	Units	Peak Hour						
					Friday PM			Sunday Mid-day			Daily
					In	Out	Total	In	Out	Total	
11	Mixed Use Development	Retail	22.5	TSF	112	122	234	112	122	234	2,575
		Less pass-by (15%)			-17	-16	-35	-17	-18	-35	-386
		Subtotal Commercial			95	104	199	95	104	199	2,189
		Office	6.3	TSF	1	5	6	1	5	6	69
		SFR	10	DU4	6	4	10	6	4	106	96
	Subtotal				102	113	215	102	113	215	2,354
12	Residential Lots	SFR	8	DU	5	3	8	5	3	8	77
13	Condominiums	MFDU	78	DU	27	13	40	27	13	40	457
14	41820 Big Bear Blvd.	Hotel	55	Rooms	17	15	32	17	15	32	449
		Retail	10	TSF	66	71	137	66	71	137	1,620
		Fast-food	2.5	TSF	45	42	87	45	42	87	1,240
		Less Pass-by (15%)			-17	-17	-34	-17	-17	-34	-414
		Subtotal Commercial			94	98	190	94	96	190	2,346
	Subtotal				111	111	222	111	111	222	2,795
15	World Harvest Faith Center	Church	20	TSF	7	6	13	7	6	13	182
16	Boat Parts Retail & Service	Auto Care Center	4,375	TSF	7	7	14	7	7	14	88
17	Storage Yard	Mini Warehouse	3	AC	6	6	12	6	6	12	117
	Total (City of Big Bear)				**294**	**284**	**576**	**294**	**284**	**578**	**6,813**
	TOTAL				**849**	**606**	**1,455**	**849**	**606**	**1,455**	**15,111**
SFR = Single Family Residence, DU = Dwelling Unit, TSF = Thousand Sq. Feet, AC = Acres											

Short-Term Impacts (Year 2010)

The ADT at key intersections for 2010 Without Project traffic conditions have been determined by adding the 2007 existing traffic volumes (with 16 percent adjustment) plus the two percent background growth volumes per year (6 percent for three years) plus the known cumulative development volumes. The 2010 Friday ADT and Sunday ADT volumes for without project traffic conditions are shown in Exhibits 4.8-8A and 4.8-8B (4-D and 4-E in the TIA).

2010 Without Project Conditions

For 2010 Without Project traffic conditions, no new traffic signals are projected to be warranted compared to Existing Conditions. Without improvements, the same intersections continue to operate at an unacceptable level of service. With traffic signals, the level of service would improve to acceptable levels.

Table 4.8-6: Intersection Analysis for 2010 Without Project Conditions

Intersection	Traffic Control	Delay in Seconds		Level of Service	
		Friday PM	Sunday MD	Friday PM	Sunday MD
Northshore Drive (SR-38) at Big Bear Blvd (SR-18)					
Without Improvements	CSS	—	—	F	F
With Improvements	TS	14.0	21.2	B	C
Standfield Cutoff at Northshore Drive:					
Without Improvements	CSS			F	F
With Improvements	TS	31.9	30.7	C	C
Stanfield Cutoff at Big Bear Blvd. (SR-18)					
Without Improvements	TS	—	—	F	F
With Improvements	TS	31.4	26.8	C	C
CSS = Cross Street Stop, TS = Traffic Signal, MD = mid-day -- = Delay High, Intersection Unstable, F LOS					

2010 With Project Conditions

The ADT for the 2010 With Project was determined by adding the Proposed Alternative Project-only traffic volumes to the 2010 Without Project traffic volumes. The 2010 Friday and Sunday ADT volumes with Proposed Alternative Project traffic are shown on Exhibit 4.8-8A and 4.8-8B (Exhibits: 4-F and 4-G of TIA), respectively.

For 2010 With Project traffic conditions, no new traffic signals are projected to be warranted as compared to 2010 Without Project conditions.

The intersection operations analysis for 2010 With Project traffic conditions are summarized in Table 4.8-7, based on the geometrics analysis at the study area intersections, without and with improvements. 2010 Without Project Friday PM and Sunday mid-day peak hour intersection turning movement volumes are shown on Exhibits 4.8-9A and 4.8-9B (Exhibits:5-A and 5-B of TIA) , respectively. As shown in Table 4.8-7, the following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday mid-day peak hours:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

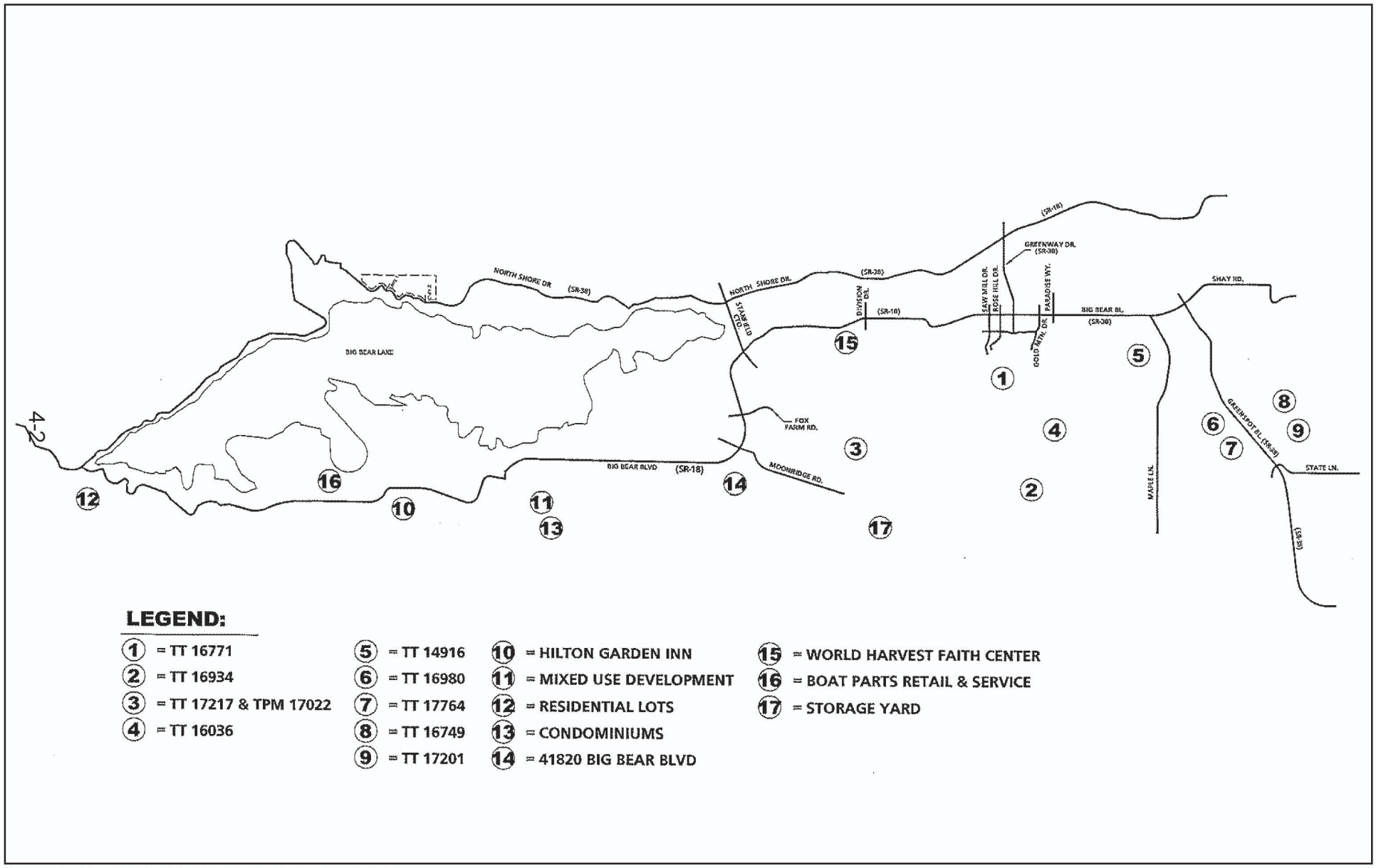
Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

As shown in Table 4.8-7, these intersections will continue to operate at unacceptable levels without improvements, but will improve to acceptable levels with the addition of traffic signals with no significant impact due to this Proposed Alternative Project. Driveway or street intersections within the Proposed Alternative Project are projected to operate at acceptable levels without traffic signals.

Table 4.8-7: Intersection Analysis for 2010 With Project Conditions

Intersection	Traffic Control	Delay in Seconds		Level of Service	
		Friday PM	Sunday MD	Friday Pm	Sunday MD
Northshore Drive (SR-38)(NS) at Big Bear Blvd. (SR 18) (EW)					
Without Improvements		—	—	F	F
With Improvements		14.0	22.1	B	C
Stanfield Cutoff (NS) at Northshore DR. (SR-38)(EW)					
Without improvements	CSS	—	—	F	F
With Improvements	TS	32.4	31.5	C	C
Stanfield Cufoff at Big Bear Blvd (SR 18) (EW)					
Without Improvments	CSS	—	—	F	F
With Improvements	TS	32.5	276	C	C
Driveway # 1 at Northshore Drive	CSS	11.1	12.0	B	B
Driveway # 2 at Northshore Drive	CSS	11.2	12.1	B	B
CSS = Cross Street Stop, TS = Traffic Signal, MD = mid-day -- = Delay High, Intersection Unstable, F LOS					



Source: URBAN CROSSROADS TIA, EXHIBIT 4-A, 2007.

NORTH

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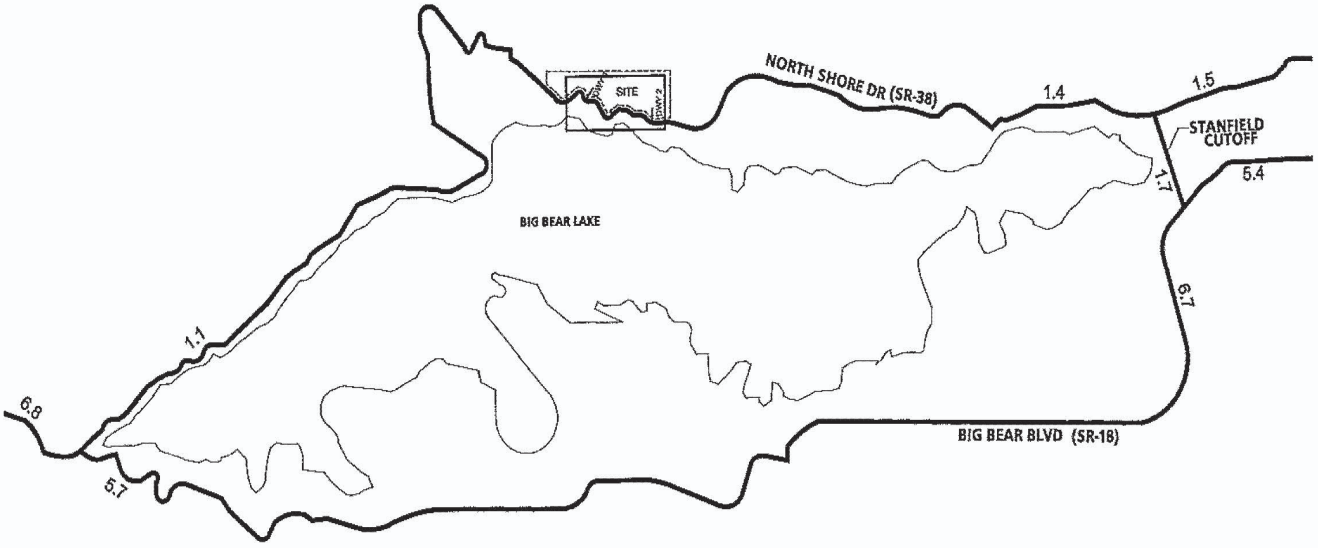
Exhibit 4.8-6
Other Development Location Map

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

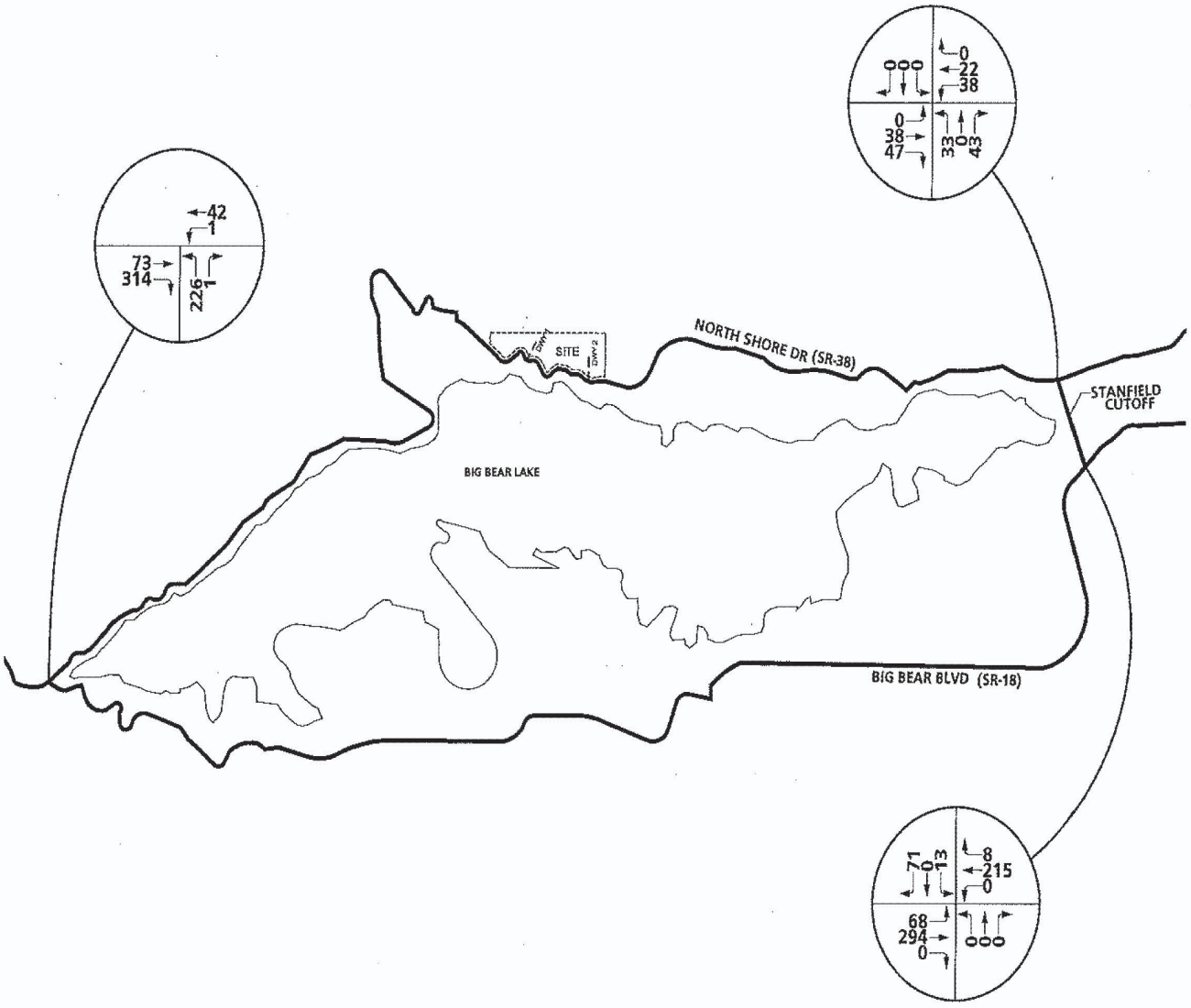


Source: URBAN CROSSROADS TIA, EXHIBIT 4-B, 2007.

NORTH

Michael Brandman Associates

Exhibit 4.8-7A
Other Development Average Daily Traffic (ADT)

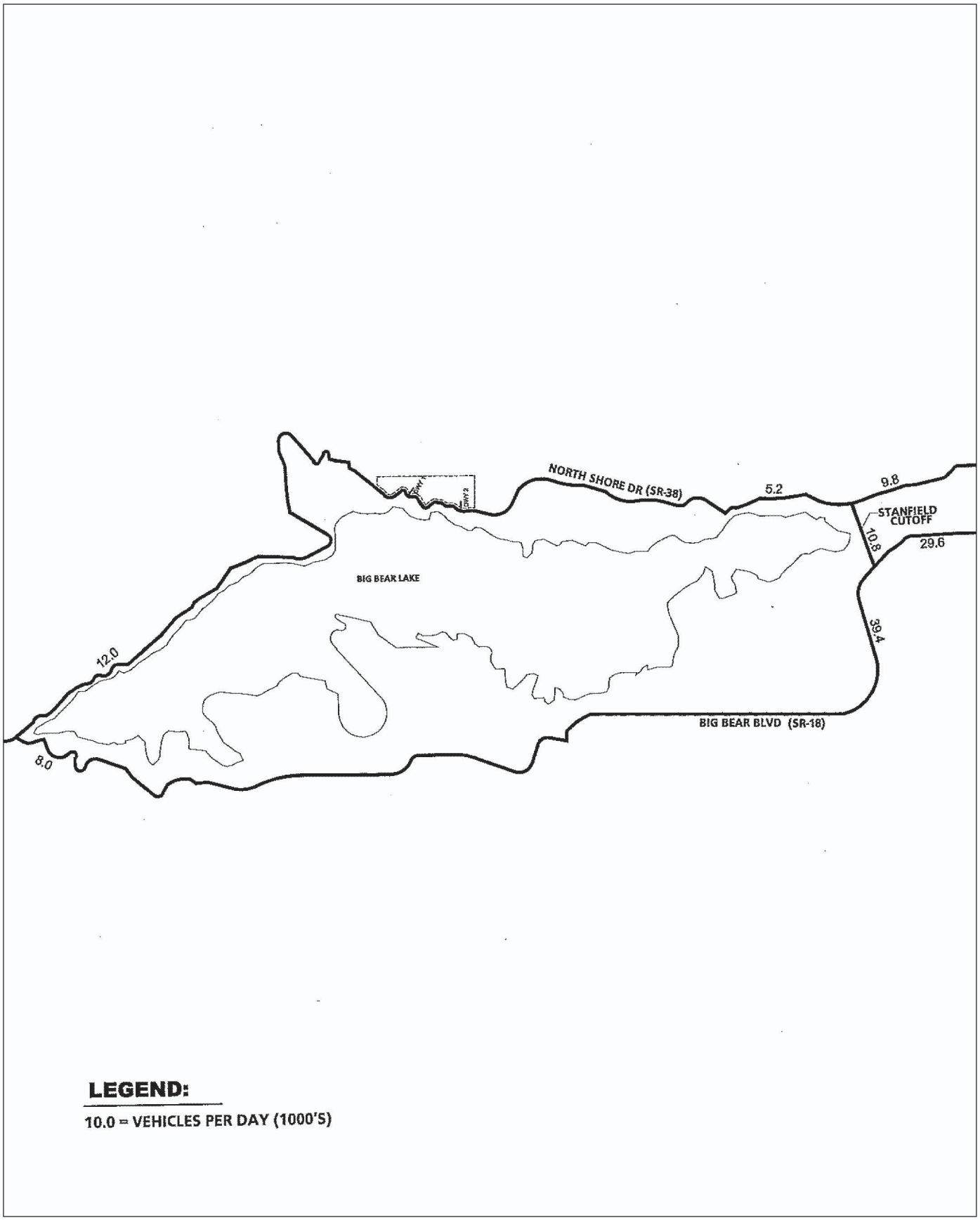


Source: URBAN CROSSROADS TIA, EXHIBIT 4-C, 2007.

NORTH

Michael Brandman Associates

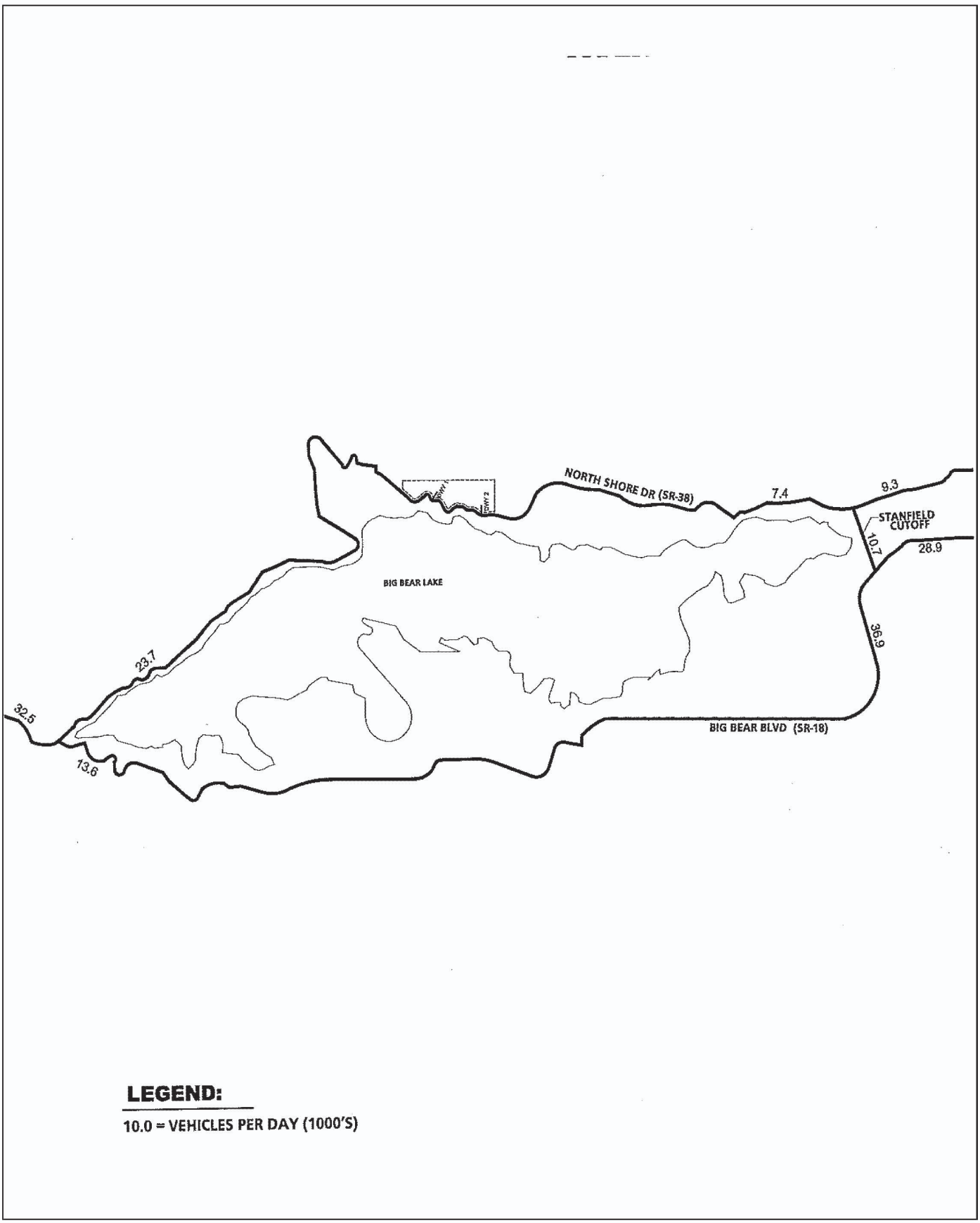
Exhibit 4.8-7B
Other Development Friday PM Peak Hour Sunday Mid-Day Peak Hour Intersection Volume



Source: URBAN CROSSROADS TIA, EXHIBIT 4-D, 2007.

Michael Brandman Associates

Exhibit 4.8-8A
2010 Without Project Friday Average Daily Traffic (ADT)



Source: URBAN CROSSROADS TIA, EXHIBIT 4-E, 2007.

NORTH

Michael Brandman Associates

Exhibit 4.8-8B
2010 Without Project Sunday Average Daily Traffic (ADT)

Long-Term Impacts (2030)

Long Range conditions were based on a General Plan Buildout (2030) that was estimated by adding the Proposed Alternative Project peak traffic and the known cumulative development peak traffic volumes to the San Bernardino Mountain Model. The intersection operations analysis for General Plan Buildout With Project (2030) traffic conditions are summarized in Table 4.8-8, based on the geometrics analysis at the study area intersections, without and with improvements. General Plan Buildout With Project (2030) Friday PM and Sunday mid-day peak hour intersection turning movement volumes are shown on Exhibits 4.8-10 A and 4.8-10B (Exhibits 5-E and 5-F of the TIA), respectively. The General Plan Buildout post-processed volumes worksheets are provided in Appendix "G" to the TIA. As shown in Table 4.8-8, without improvements, the following study area intersections would operate at an unacceptable level of service during both Friday PM and Sunday mid-day peak hours:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

Driveway #1 (NS) at:

- North Shore Drive (SR-38) (EW)

Driveway #2 (NS) at:

- North Shore Drive (SR-38) (EW)

Table 4.8-8: Intersection Analysis for General Plan Buildout (2030) Conditions

Intersection	Traffic Control	Intersection Approach Lanes				Delay (Secs.)		Level of Service	
		North-bound	South-bound	East-bound	West-bound				
		L T R	L T R	L T R	L T R	Fri. PM	Sun. MD	Fri. PM	Sun. MD
Northshore Dr. (SR-38)(NS) at Big Bear Blvd									

Table 4.8 8 (cont.): Intersection Analysis for General Plan Buildout (2030) Conditions

Intersection	Traffic Control	Intersection Approach Lanes				Delay (Secs.)		Level of Service	
		North-bound	South-bound	East-bound	West-bound				
		L T R	L T R	L T R	L T R	Fri. PM	Sun. MD	Fri. PM	Sun. MD
Without improvements	CSS	0 1 0	0 0 0	0 1 1	1 1 0	—[1]	—[1]	F	F
With improvements	TS	1 0 1	0 0 0	0 2 1>	1 1 0	20.4	18.6	C	B
Stanfield Cutoff (NS) at Northshore Dr. (SR38) (EW)									
Without improvements	CSS	0 1 0	0 1 0	0 1 0	0 1 0	--[1]	--[1]	F	F
With improvements	TS	2 1 0	1 1 0	1 1 1>	1 1 0	34.2	26.0	C	C
Stanfield Cutoff (NS) at Big Bear Blvd (SR 16) (EW)									
Without improvements	TS	0 1 1	0 1 1	1 1 1	1 1 1	—[1]	—[1]	F	F
With improvements	TS	1 1 0	1 1 1>	1 2 0	1 2 1	31.7	21.5	C	C
Driveway #1 (NS) at Northshore Dr. (EW)									
Without improvments	CSS	0 0 0	0 1 0	0 1 0	0 1 0	49.6	24.2	E	C
With improvements	CSS	0 0 0	0 1 0	0 2 0	0 1 0	23.1	15.7	C	C
Driveway # 2 (NS) at Northshore Dr. (EW)									
Without improvements	CSS	0 0 0	0 1 0	0 1 0	0 1 0	41.9	18.8	E	C
With improvements	CSS	0 0 0	0 1 0	0 2 0	0 1 0	23.6	15.7	C	C

L = left, T= through, R = right, CSS = Cross Street Stop, TS = Traffic Signal, MD = mid-day
[1]-- = Delay high, intersection unstable, level of service F
1 = Improvement, > = Right turn overlap phase

Parking

Under the Proposed Alternative Project, each residence would have two parking spaces in the driveway, as required by San Bernardino County Development and building codes. Additionally, there would be a parking lot to service the marina and the open space conservation easement on the lakeshore. The parking lot would have 12 parking spaces for use by the public and the residents of Moon Camp. Only the residents would be allowed access to the marina and the boat launch. Each residence would be assigned a slip to store one boat.

Emergency Access

Emergency access would occur through the two driveways, and an additional fire gate would be provided on the east end of the Proposed Alternative Project.

Summary of Traffic Impacts

The traffic issues related to the Proposed Alternative Project have been evaluated in the context of CEQA and the San Bernardino County CMP. In conformance with the requirements of the San Bernardino County CMP, the Proposed Alternative Project does not require a CMP traffic study. (The CMP requires no analysis for projects that generate less than 250 peak hour trips.) The Proposed Alternative Project generates approximately 51 trips during the AM peak hours and 51 trips during the PM peak hours, which is less than the required threshold for a CMP traffic study. However, a long-range traffic analysis has been required by County staff.

Proposed Alternative Project traffic volumes for all future conditions were estimated using a manual approach. The trip generation calculation was based on the most recent *Institute of Transportation Engineers Trip Generation Rates*, 7th Edition. The Proposed Alternative Project trip distributions were derived from a select zone run of the San Bernardino Mountain Model. Long Range General Plan Buildout (2030) conditions were estimated based on the San Bernardino Mountain Model and the addition of both the Proposed Alternative Project related peak hour volumes and the known cumulative development peak hour volumes per discussions with County staff.

The traffic analysis indicates that under present conditions, affected intersections will operate at less than acceptable rates with or without the Proposed Alternative Project. Traffic improvements are needed for existing conditions and projected conditions whether or not this Proposed Alternative Project is implemented. According to the traffic study, all study intersections are expected to operate at a LOS C or better during peak hours for the scenario analyzed with improvements installed.

Level of Significance before Mitigation

Potentially significant.

4.8.3 - Standard Conditions and Uniform Codes

The traffic evaluation shall be consistent with CEQA and the San Bernardino County Congestion Management Plan. Additionally, the County of San Bernardino has required a long range traffic study to be generated for this Proposed Alternative Project.

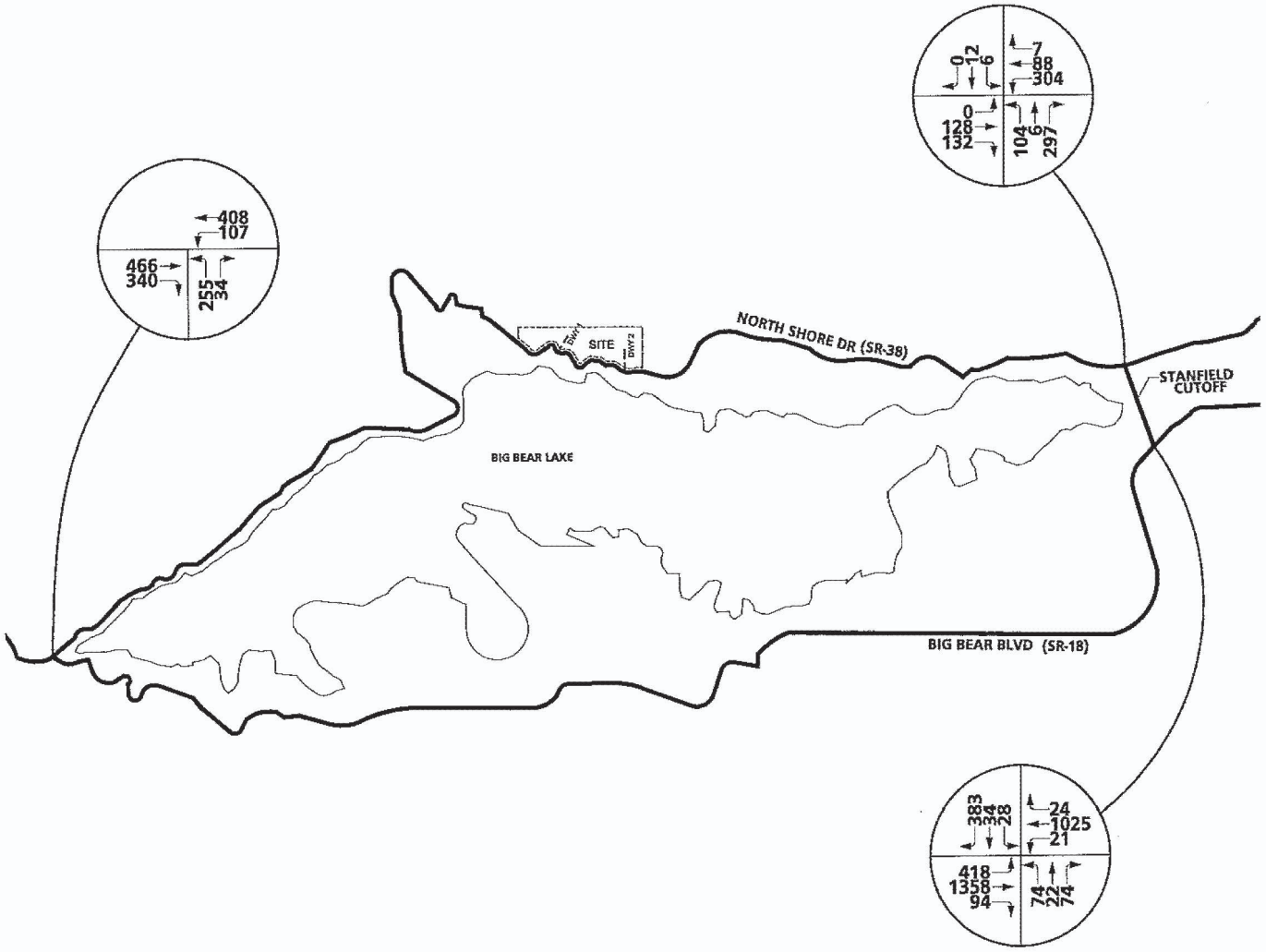
4.8.4 - Project Design Features

The TIA recommends the following Proposed Alternative Project design features:

On-Site Improvements

On-site improvements and improvements adjacent to the site will be required in conjunction with the proposed development to ensure adequate circulation within the Proposed Alternative Project. Exhibit 4.8-11 (Exhibit 6-A of TIA) illustrates the recommended improvement measures to address on-site circulation requirements of the proposed site, which include the following:

- Sight distance at the Proposed Alternative Project access roadway should be reviewed with respect to Caltrans / County of San Bernardino sight distance standards at the time of final grading landscape and street improvement plans.
- Traffic signing / striping should be implemented in conjunction with detailed construction plans for the Proposed Alternative Project site.
- Construct North Shore Drive at its ultimate half-section width as a Mountain Major highway from Canyon Drive to the Easterly Proposed Alternative Project boundary.
- Install a stop sign control at Driveway #1 and Driveway #2
- Construct an Eastbound Left Turn Lane at Driveway 1 / North Shore Drive and Driveway 2/ North Shore Drive for 2030 Buildout Conditions
- Construct a 2nd Eastbound Through Lane at Driveway 1 / North Shore Drive and Driveway 2/ North Shore Drive for 2030 Buildout Conditions.

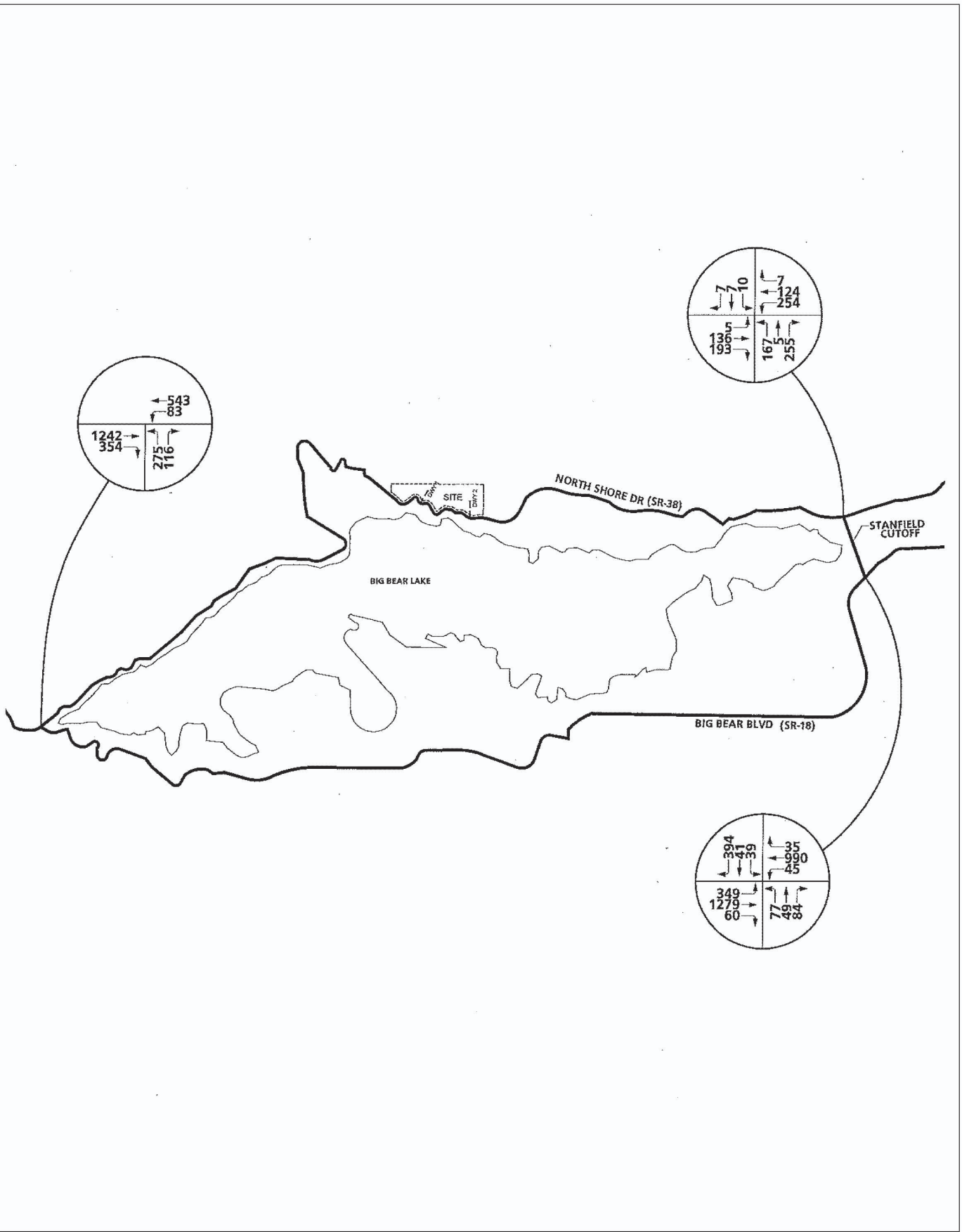


Source: URBAN CROSSROADS TIA, EXHIBIT 5-A, 2007.

NORTH

Michael Brandman Associates

Exhibit 4.8-9A
2010 Without Project Friday PM Peak Hour Intersection Volumes

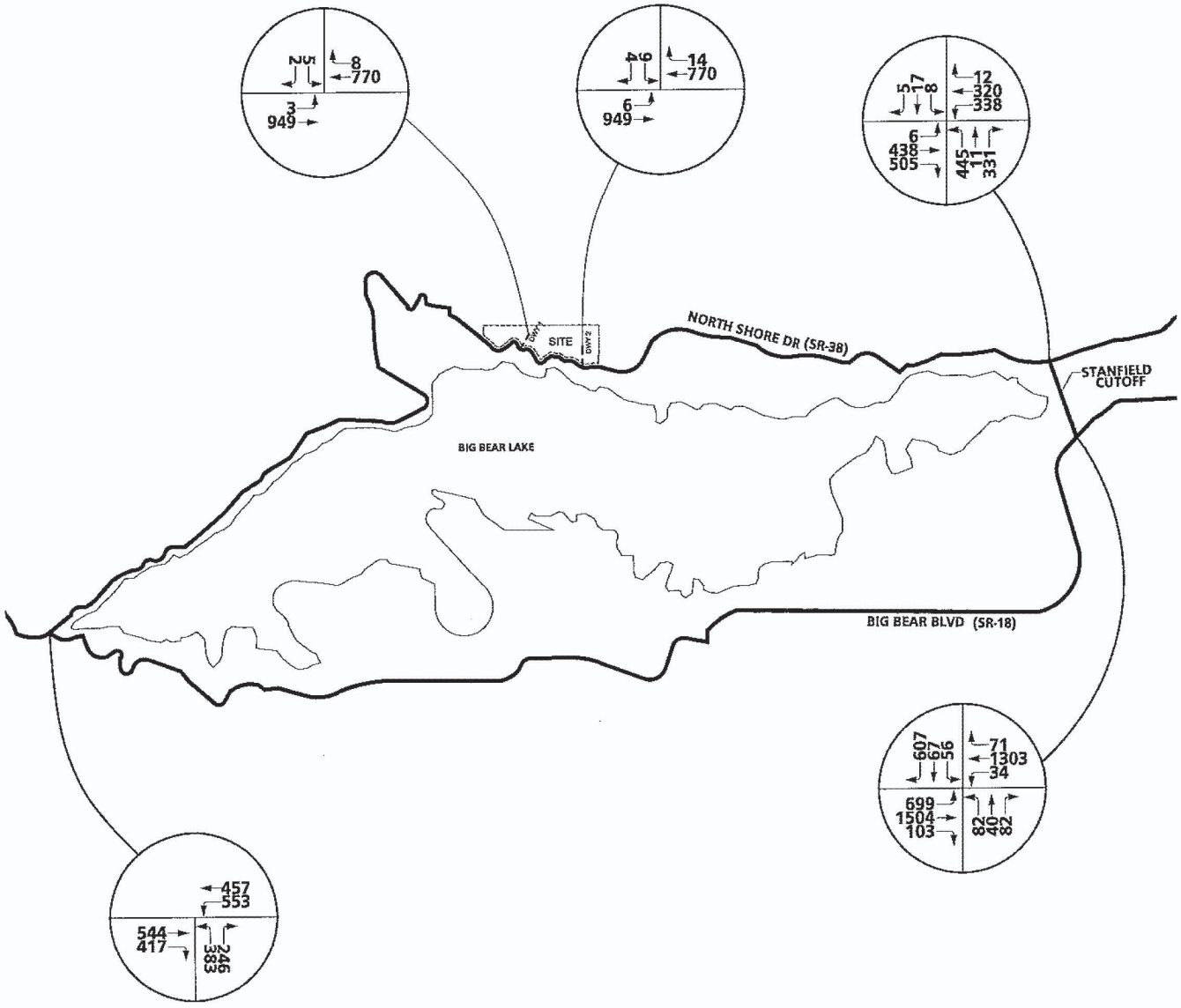


Source: URBAN CROSSROADS TIA, EXHIBIT 5-B, 2007.

NORTH

Michael Brandman Associates

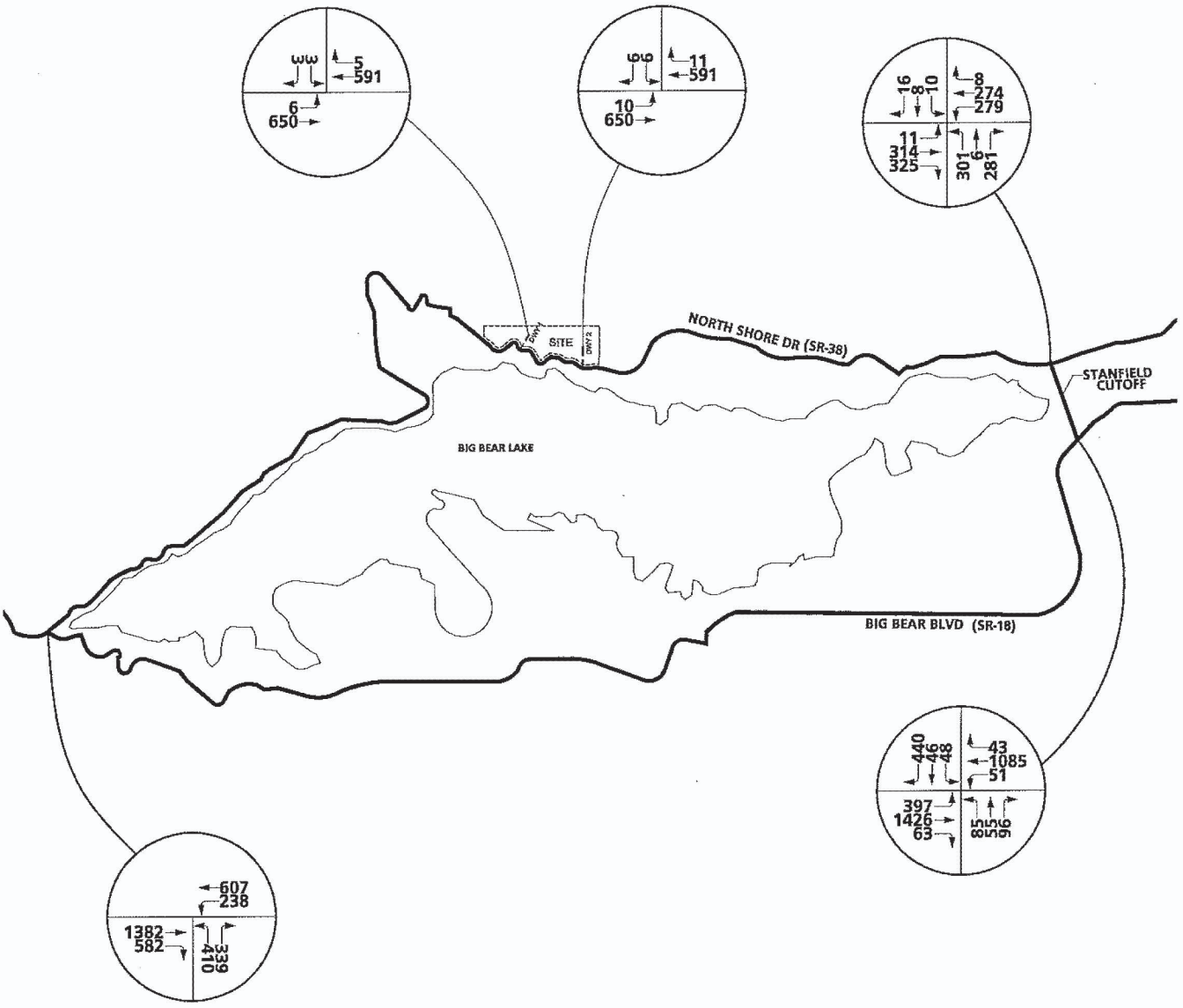
Exhibit 4.8-9B
2010 Without Project Sunday Mid-Day Peak Hour Intersection Volumes



Source: URBAN CROSSROADS TIA, EXHIBIT 5-E, 2007.

Exhibit 4.8-10A
General Plan Buildout With Project Friday PM Peak Hour Intersection Volumes

Michael Brandman Associates

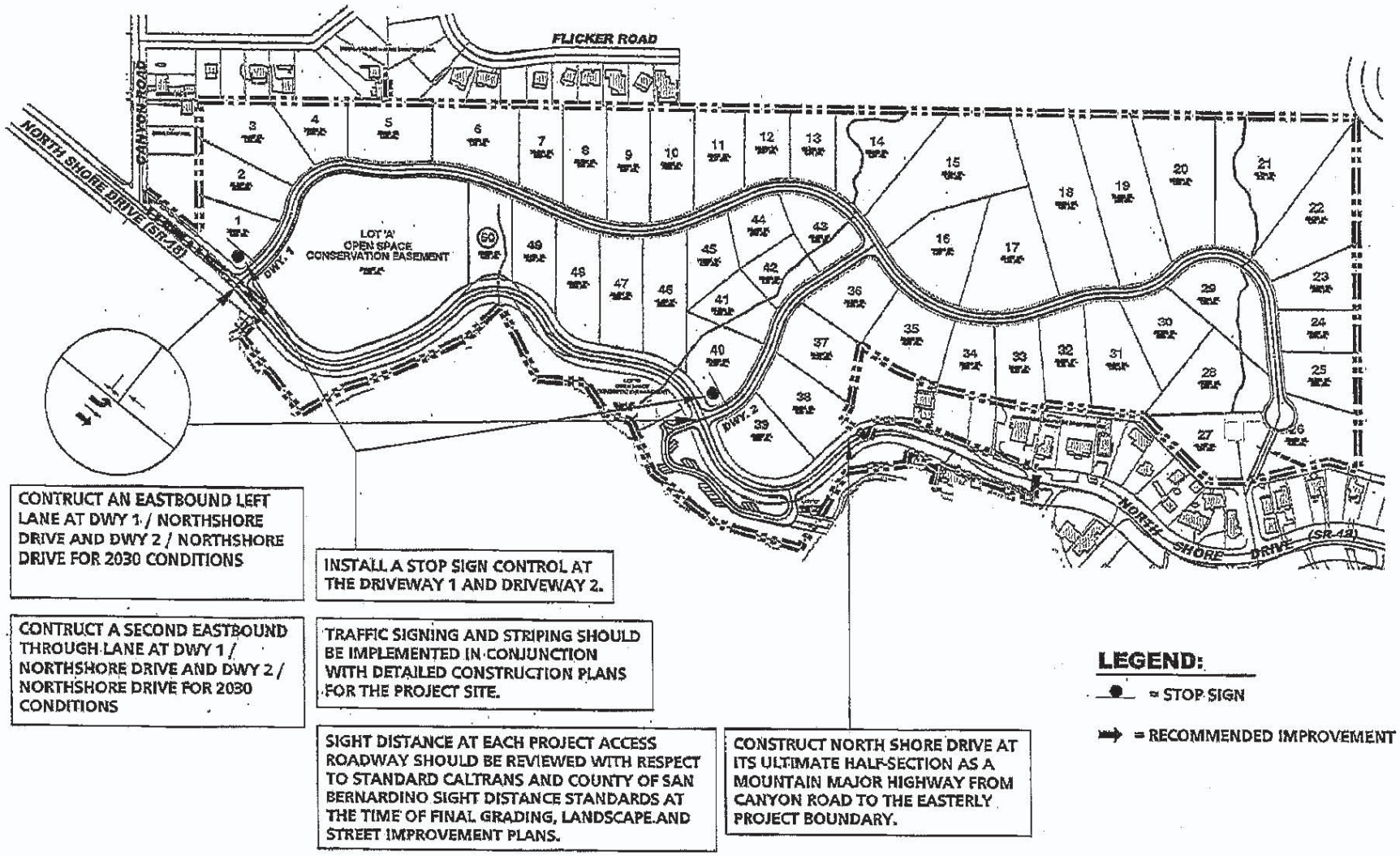


Source: URBAN CROSSROADS TIA, EXHIBIT 5-F, 2007.

NORTH

Michael Brandman Associates

Exhibit 4.8-10B
General Plan Buildout With Project Sunday Mid-Day Peak Hour Intersection Volumes



Source: URBAN CROSSROADS.

Michael Brandman Associates

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Exhibit 4.8-11
Circulation Recommendations

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Off Site Improvements

The traffic analysis indicates that under present conditions, affected intersections will operate at less than acceptable rates with or without the Proposed Alternative Project. Traffic improvements are needed for existing conditions and projected conditions whether or not this Proposed Alternative Project is implemented. If needed improvements are installed, implementation of this Proposed Alternative Project will not significantly reduce the level of service off-site. Nevertheless, fair share costs have been calculated.

Table 4.8-9 lists traffic improvements and associated costs needed to improve future traffic conditions in the Big Bear area as related to this Proposed Alternative Project.

Table 4.8-9: Roadway Improvement Costs

Intersection	2030 Improvements	Costs
North Shore Dr. (SR-38) at Big Bear Blvd (SR 18) (EW)	Install Traffic Signal Construct NB Left Turn Lane Construct EB Through Lane Add Right Turn Overlap Phasing Subtotal	$400,000 $50,000 $289,720 $25,000 $764.720
Stanfield Cutoff (NS) at Northshore Drive (EW)	Install Traffic Signal Construct 2 NB Left Turn Lanes Construct SB Left Turn Lane Construct EB Left Turn Lane Construct EB Right Turn Lane Add Right Turn Overlap Phasing Construct WB Left Turn Lane Subtotal	$400,000 $100,000 $50,000 $50,000 $50,000 $25,000 $50,000 $725,000
Stanfield Cutoff (NS) at Big Bear Blvd. (EW)	Construct NB Left Turn Lane Construct SB Left Turn Lane Construct SB Right Turn Lane Add Right Turn Overlap Phasing Construct EB Through Lane Construct WB Through Lane Signal Modification Subtotal	$50,000 $50,000 $50,000 $25,000 $289,720 $289,720 $40,000 $794,440
Total Cost of Construction		**$2,284,160**
Source: Appendix G of the San Bernardino Congestion Management Program, 2003 Update.		

The Proposed Alternative Project fair share contribution towards the required improvements has been calculated. Table 4.8-10 includes the Proposed Alternative Project's cost contribution based on the Proposed Alternative Project's percent of new traffic. As indicated in Table 4.8-10, the highest Friday PM or Sunday mid-day fair share cost is approximately $48,921.

Table 4.8-10: Proposed Alternative Project Fair Share Costs

Segment	Cost ($)	Peak Hours	Existing Traffic	2030 With Project Traffic	Project Traffic	Total New Traffic	Project % of New Traffic	(A) Friday PM Project Cost Share ($)	(B) Sunday MD Project Cost Share ($)	Highest Friday PM or Sunday MD Cost Share ($)
Northshore Dr. at Big Bear Blvd.	764,720	Fri. PM Sunday MD	906 2,208	2,600 3,558	16 26	1,694 1,350	0.94% 1.93%	7,223	14,728	14,728
Standfield Cutoff at Northshore Dr.	725,000	Fri. PM Sunday MD	822 904	2,436 1,833	36 26	1,614 929	2.23% 2.80%	16,171	20,291	20,291
Standfield Cutoff at Big Bear Blvd.	794,440	Fri. PM Sunday MD	2,745 2,635	4,648 3,835	29 21	1,903 1,200	1.52% 1.75%	12,107	13,903	13,903
Grand Total – Cost Share for Improvements								**35,500**	**48,921**	**48,921**

4.8.5 - Mitigation Measures

To assure that potential traffic impacts of the Proposed Alternative Project remain at less than significant levels, the following mitigation measures are proposed:

T-1 The following Project Design Features recommended in the Traffic Impact Analysis shall be incorporated into the Proposed Alternative Project design:

- Construction of North Shore Drive at its ultimate half-section width as a Mountain Major highway from Canyon Drive to the Easterly Proposed Alternative Project boundary.
- Installation of a stop sign control at Driveway #1 and Driveway #2
- Construction of an Eastbound Left Turn Lane at Driveway 1 / North Shore Drive and Driveway 2/ North Shore Drive for 2030 Buildout Conditions.
- Construction of a 2nd Eastbound Through Lane at Driveway 1 / North Shore Drive and Driveway 2/ North Shore Drive for 2030 Buildout Conditions.

T-2 The eastbound left turn lanes at both project access points will be constructed at opening year at 100 percent cost to the Applicant. The Applicant shall pay fair share costs of the construction of the eastbound through lanes at both project access points for the horizon year conditions. The developer shall pay the fair share cost of $48,921 toward the off-site traffic improvements recommended in Appendix G of the San Bernardino Congestion Management Program, 2003 Update.

4.8.6 - Level of Significance After Mitigation

Less than significant. With incorporation of recommended project design features and payment of fair share costs of impacted off-site roadway intersections, traffic and circulation impacts related to the Moon Camp Proposed Alternative Project will be reduced to less than significant.

4.9 - Utilities

This section presents a discussion of the existing and proposed utilities available to serve the Proposed Alternative Project (Moon Camp Project - 50 lots), which has been modified from the Original Proposed Project (92 lots) described in the 2005 Final Environmental Impact Report (EIR). This section includes an analysis of potential impacts to water supply, sewer and wastewater, natural gas, electricity, and stormwater.

In addition, the discussion of groundwater and water supply is based on the Recommendations for Groundwater Monitoring, prepared by Geoscience Support Services, Inc, September 2004 (Appendix G), the Final Feasibility Study to Serve the Proposed Moon Camp Residential Development (TTM No. 16136), March 2007, Prepared by ALDA Engineering, Inc. (Appendix G); the Moon Camp Well FP-Z Report, August 2008, prepared by California Collaborative Solutions, August 2008 (Appendix G); the "Water Supply Analysis," February 2009, prepared by California Collaborative Solutions (Appendix C); and the "Water Supply Report," May 2009, prepared by California Collaborative Solutions (containing the Thomas Harder Groundwater Consulting Analysis and Big Bear DWP correspondence letter, May 2009) (Appendix C).

4.9.1 - Existing Conditions

Water

The project site lies primarily within a tributary aquifer of the North Shore Subunit designated as Subarea A. A small area within the northwest portion of the project site lies within a separate, adjoining tributary aquifer of the Grout Creek Subunit designated as Subarea D. There are three groundwater wells within the project site, FP2, FP3 and FP4, which were constructed and are owned by the project's property owner and developer. Two of these Project Wells (FP2 and FP3) are located in Subarea A. As part of the North Shore Subunit, Subarea A is a separate groundwater basin and is not a part of the Grout Creek Subunit from which the existing Fawnskin system draws its water. Approximately 40 private, homeowner wells also withdraw water from Subarea A's groundwater aquifer. Project Well FP4 is located in the northwest corner of the project site and draws its water from Subarea D of the Grout Creek Groundwater Subunit. The general location of Project Well FP-4 is shown in Exhibit 4.4-1, Grout Creek Hydrologic Subunit.

Although water service is not presently provided to the project site, the site is immediately adjacent to the Fawnskin Water System, which is owned and operated by the Big Bear Lake Department of Water and Power. Water supply in the Fawnskin Water System is provided by two groundwater wells in the Lower Fawnskin pressure zone and by slant wells in the vicinity of the Racoon Reservoir, all of which draw water from the Grout Creek Subunit. Excess groundwater production from the Lower Fawnskin pressure zone is conveyed to the Upper Fawnskin pressure zone through a booster station located at the Cline Miller Reservoir.

The Department of Water and Power (DWP) provides water service to more than 16,000 customers from four separate water systems within the San Bernardino Mountains of southern California. All of the DWP's water comes from snow and rain that percolates back into the ground. Only 3 to 5 percent of the snow and rain reaches the water table and is recharged for future use. The DWP does not utilize water from Big Bear Lake and no additional water is imported into the Big Bear Valley. The DWP maintains 50 wells, 13 booster stations, 17 reservoirs, 16 chlorination stations, 20 sample stations, approximately 170 miles of water main pipeline, and a complex pressure-reducing network (www.bbldwp.com).

The majority of DWP customers are located in Big Bear Valley. The DWP provides water to its Big Bear Valley customers by pumping ground water from local aquifers. Currently, no outside water source is available to augment the local supply. The remaining system is in Rimforest, California, located near Lake Arrowhead and water used in this system is purchased from the Crestline-Lake Arrowhead Water Agency (CLAWA) (www.bbldwp.com).

Although DWP has completed a Water Feasibility Study (Alda, 2007) and provided a conditional will serve letter to the Applicant, the majority of the project site is outside of the DWP authorized service area as well as the City's Sphere of Influence. As a result, DWP cannot provide water service without first complying with the provisions of Government Code Section 56133, which requires that cities receive Local Agency Formation Commission (LAFCO) annexation approval to provide new or extended services outside their jurisdictional boundaries, but within their spheres of influence.

Wastewater

The project site is located within County Service Area 53B (CSA 53B) and the Big Bear Area Regional Wastewater Agency (BBARWA) sanitary sewer service area. The service area for BBARWA includes the entire Big Bear Valley (79,000 acres) and is served by three separate collection systems: City of Big Bear Lake, Big Bear City Community Services District, and the County of San Bernardino CSA 53B (representing approximately 4 percent of the BBARWA total flow). Each underlying Agency maintains and operates its own wastewater collection system and delivers wastewater to BBARWA's interceptor system for transport to BBARWA's Regional Wastewater Treatment Plant. The regional plant is a 93.5-acre site located adjacent to Baldwin Lake in unincorporated San Bernardino County. The regional plant processes approximately 2.8 billion gallons per year (gpy). In 2006, the Fawnskin area (CSA 53B) produced an average of 80,000 gallons of effluent per day, or approximately 29 million gpy.

Sewage from CSA 53B is transported via the BBARWA North Shore Interceptor/Force Main system to the Regional Wastewater Treatment Plant. Currently, BBARWA has a 10-inch sewer force main located within the shoulder along the south side of State Route 38 (SR-38) that traverses the project site. This force main conveys raw sewage from CSA 53B to the Regional Wastewater Treatment Plant.

Solid Waste

Solid waste collection within the project area would most likely be provided by Big Bear Disposal, Inc. Waste would be transported to the Big Bear Transfer Station, located on Holcomb Valley Road in Big Bear City, approximately 1.5 miles north of Highway 18. The transfer station is owned and operated by the County of San Bernardino Waste Management Division. From the transfer station, solid waste is transferred to the Barstow Landfill; a County of San Bernardino owned and operated facility. The landfill is currently permitted to receive 750 tons of waste per day. The landfill is currently at approximately 25 percent of the original capacity of 3.58 million cubic yards. Closure is scheduled for May 1, 2012. However, as part of the County's strategy for long-range solid waste disposal, the Barstow Landfill could be expanded onto adjacent county-owned property.

Natural Gas

The project site is located entirely within the Southwest Gas Corporation (SGC) utility service territory. A natural gas pipeline is currently installed on the project within the SR-38 right-of-way, very near Big Bear Lake. However, since the site is vacant, no service currently extends onto the site.

SGC is principally engaged in the business of purchasing, transporting and distributing natural gas to residential, commercial and industrial customers in the southwestern United States. SGC serves approximately 1.8 million customers in Arizona, Nevada and portions of California. The company added 71,000 customers in 2006, maintaining its status as one of the fastest-growing natural gas distribution companies in the nation (excluding mergers and acquisitions).

Electricity

Bear Valley Electric Service (BVE) is the local provider of electricity. BVE provides electric power to more than 20,000 customers in the communities surrounding Big Bear Lake, including the Fawnskin area.

BVE recently constructed a local power generating station to provide backup power and peak power to supplement the two power lines that feed the valley. An overhead power line traverses the project site in an east/west direction and is adjacent to and along SR-38.

4.9.2 - Thresholds of Significance

The following criteria for establishing the significance of potential impacts on public services resources were derived from Appendix G of the California Environmental Quality Act (CEQA) Guidelines. The proposed project would result in potentially significant impacts to public services if the project would:

a.) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board (RWQCB);

b.) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

c.) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

d.) Have insufficient water supplies available to serve the project from existing entitlements and resource, or are new or expanded entitlements needed;

e.) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;

f.) Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; and

g.) Not comply with federal, state, and local statutes and regulations related to solid waste.

4.9.3 - Project Impact Analysis

Projected Utility Use

Table 4.9-1 estimates the utilities consumed/generated by the Proposed Alternative Project.

Table 4.9-1: Projected Utility Use

Utility	Average Usage	Moon Camp Total/Day*	Moon Camp Total/Year*
Water			
Consumption Rate	250gallons/day/unit	12,500 gallons/day	14 acre-feet/year([1])
Sewer			
Generation Rate	215 gallons/day/unit	10,750 gallons/day	3.9 million/gallons/year([2])
Electricity			
Consumption Rate	16.66 kWh /unit/day	833 kWh/day	304 thousand kWh/year
Natural Gas			
Consumption Rate	219.12 cubic feet/unit/day	10,956 cubic feet/day	4 million cubic feet/year
Solid Waste			
Generation Rate	20 pounds/day/household	1,000 pounds/day	182.5 tons/year

Source - Water Feasibility Study([1]) (Alda, 2007); Sewer Feasibility Study([2])(So, 2007).
* Based on 116 residents (50 units at 2.31 persons/unit; persons/unit).
Note: Totals could be slightly off due to rounding.

4.9.4 - Water Service Alternatives

Although water service is not presently provided to the project site, the site is immediately adjacent to the jurisdiction of the DWP and annexation to the DWP's authorized service area is one of three

possible water service alternatives. DWP has conducted a Water Feasibility Study (Alda, 2007), and provided a conditional will serve letter to the Applicant. However, the majority of the project site is outside of the DWP authorized service area as well as the City's Sphere of Influence. DWP cannot provide water service without first complying with the provisions of Government Code Section 56133, which pertains to the LAFCO annexation process. In order for the DWP to provide water service to the project site and to own and operate the Proposed Alternative Project's water system, LAFCO would have to approve an expansion of the City of Big Bear Lake's Sphere of Influence (SOI) to include the entire existing DWP Water Service Area in Fawnskin as well as the entire project site. The developer would be required to construct the on-site and off-site facilities as described in the DWP's Water Feasibility Study (Alda, 2007). This is Water Service Alternative #1 (see below for details).

Water Service Alternative #2 (see below for details) would not require LAFCO's approval and would not create the expansion of the City's Sphere of Influence around Fawnskin and the project site. Instead, County Service Area 53C (CSA 53C) would own and operate the water facilities within the project site and contract with the DWP for a water interconnection to the existing Fawnskin water system. The developer would be required to construct the same on-site and off-site facilities as described in the DWP's Water Feasibility Study (Alda, 2007).

Water Service Alternative #3 (see below for details) would not require LAFCO's approval and would not create the expansion of the City's Sphere of Influence around Fawnskin and the project site. Alternative #3 would involve the developer constructing an independent water system completely within the project site. The developer would construct the same on-site water lines as in Water Alternatives #1 and #2, and, in addition the required water reservoir and water booster station would be constructed by the developer on the project site (rather than constructing the off-site water facilities identified in the DWP's Water Feasibility Study). CSA 53C would own and operate this independent water system.

Water Service Alternative #1

According to the Water Feasibility Study prepared by Alda Engineering Inc. (Appendix G), water service to the project site could be provided from the DWP's Upper Fawnskin pressure zone (*Water Feasibility Study*, Appendix G, Alternative B). However, significant transmission improvements in the Fawnskin system would be needed to provide fire flow to the project site. The closest DWP pipeline within the Upper Fawnskin system is a single six-inch-diameter pipeline located near the intersection of Flicker Road and Chinook Road, approximately 2,000 feet from the westerly boundary of the project site.

The Upper Fawnskin pressure zone has an operating hydraulic grade of 7,113 feet set by the high water level of the existing 0.25-million gallon Racoon Reservoir. Based on this hydraulic elevation, static pressures within the project site would range from a low of 71 psi at the highest point in Lot 18 to 157 psi near the lake. Therefore, individual pressure regulators would be required for all lots with

static pressures exceeding 80 psi. The future home owners would install and fund the individual pressure regulators as required for specific lots.

Projected water demand for the Proposed Alternative Project, Moon Camp 50-lot subdivision, is based on the DWP's Water Feasibility Study consumption rate of 250 gallons per day (gpd) per connection. Exhibit 2-6, Proposed Water Facilities, shows the proposed water system. Maximum day demand is estimated based on information provided in the recently completed DWP Water Master Plan and it is equivalent to 1.76 times the average day demand. Therefore, the average and maximum day demands for the Proposed Alternative Project's 50-lot subdivision are estimated as follows:

- Average Day Demand (ADD) = 12,500 gpd or 8.68 gallons per minute (gpm); and
- Maximum Day Demand (MDD) = 15.27 gpm.

Based on an estimated average day demand of 12,500 gallons, the annual water demand for the Proposed Alterative Project (50 lots) is estimated at 4.56 million gallons or 14 acre-feet per year. Required fire flow and water storage for the Proposed Alternative Project are identified in the Alda Water Feasibility Study (Appendix G) as 1,750 gpm with a 2-hour duration, and 238,600 gallons of storage.

Currently there are three groundwater wells on-site (constructed by the project's property owner and developer), Wells FP2, FP3 and FP4. Alternative #1 involves wells FP2, FP3, and FP4 being deeded to the DWP at the time the tract map is recorded.

The Water Feasibility Study provides two options (A and B) for expanding the existing Fawnskin Water System infrastructure. Option B has been chosen by DWP and the Applicant as the preferred Water Feasibility Study alternative for Water Service Alternative #1. In either case, the Applicant would install all common infrastructures, including fire hydrants, and would also install the water main lines within the project site. The water improvements will primarily occur within existing paved roads. Nearby residents are not required to tie into the proposed DWP water system. The impacts related to the installation of the off-site and on-site water improvements would be temporary and are considered less than significant. See Exhibit 2-6 for the proposed water facilities and improvements.

Water Service Alternative #2

This Alternative assumes the City does not wish to expand its Sphere of Influence, or that LAFCO does not approve an expansion of the City of Big Bear Lake's Sphere of Influence to include the entire existing DWP Water Service Area in Fawnskin as well as the entire project site (Water Service Alternative #1). The existing County Service Area 53C (CSA 53C) is authorized to own and operate water systems, and currently CSA 53C encompasses the entire project site. No LAFCO action would be required for CSA 53C to own and operate the Proposed Alternative Project's Water System.

Alternative #2 would include the developer constructing the on-site and off-site water facilities contained in the DWP's Water Feasibility Study (Alda, 2007); CSA 53C owning and operating the Proposed Alternative Project's Onsite Water System (the three water wells and the water main lines); DWP owning and operating the water facilities constructed by the developer within the DWP's Fawnskin Water System; and CSA 53C contracting with the DWP for a water interconnect between the DWP's existing Fawnskin Water System and the Proposed Alternative Project's Onsite Water System.

All of the water demand calculations for the Proposed Alternative Project, water system descriptions, and the Water Feasibility Study Option B described in Water Service Alternative #1, apply to Water Service Alternative #2.

The water improvements for Water Service Alternative #2 would primarily occur within existing paved roads. The impacts related to the installation of the off-site and on-site water improvements would be temporary and are considered less than significant. See Exhibit 2-6 for the proposed water facilities and improvements.

Water Service Alternative #3

Instead of constructing the off-site water facilities (within the Fawnskin Water System) identified in the DWP's Water Feasibility Study Option B (Alda, 2007, which is the basis for Water Service Alternatives #1 and #2, above), the Proposed Alternative Project's developer would construct an on-site reservoir (238,600 gallons) and an on-site booster station capable of providing the daily water supply flow and the required 1,750 gallons per minute fire flow. The reservoir and booster station would be sized based upon the same demand calculations contained in the Water Feasibility Study and Water Service Alternatives #1 and #2:

- Average Day Demand (ADD) = 8.68 gpm.
- Maximum Day Demand (MDD) = 15.27 gpm;
- Fire Flow = 1,750 gpm with a 2 hour duration;
- Operational Storage = 30% of MDD (15.27 gpm) = 6,600 gallons;
- Emergency Storage = 100% of MDD (15.27 gpm) = 22,000 gallons;
- Fire Flow Storage for 1,750 gpm (2 hour duration) = 210,000 gallons; and
- Total Storage Requirement per the Alda Water Feasibility Study = 238,600 gallons.

The developer would also construct the same on-site (within the project site) water facilities (water main lines, fire hydrants, etc) identified in the Alda Water Feasibility Study. Existing water wells FP2 and FP4 would be connected to the on-site water system and pump their water into the 238,600 gallon on-site reservoir. The on-site booster station would produce the Average and Maximum Daily Demand flows (8.68 gpm and 15.27 gpm) and the Fire Flow of 1,750 gpm for the 2-hour duration. The booster station would include an emergency electrical generator to allow the station to operate during a power outage.

The water improvements for Water Service Alternative #3 will primarily occur within the Proposed Alternative Project's paved roads and at the Proposed Alternative Project's reservoir site. The construction of the reservoir would include grading an approximately 75-foot-diameter pad for the reservoir. The impacts related to the installation of the on-site water improvements would be temporary and are considered less than significant.

4.9.5 - Proposed Alternative Project - Water Demand and Water Supply

The Water Feasibility Study calculates the Water Demand for the Proposed Alternative Project as:

- 250 gallons per day per connection x 50 lots = 12,500 gallons per day;
- 12,500 gallons per day x 365 days/year = 4,562,500 gallons per year; and
- 4,562,500 gallons per year is equal to 14 acre-feet per year.

The water supply for the Proposed Alternative Project's 14 acre-feet per year demand will come from two groundwater basins. Based on two separate reports prepared by Geoscience in 2000 and 2003 (included as appendices to the 2005 Final EIR), the annual groundwater recharge for Subarea A of the North Shore Subunit is between 14 and 44 acre-feet per year, with an estimated annual Maximum Perennial Yield of 29 acre-feet per year. In order to be as conservative as possible, the "minimum recharge" of 14 acre-feet per year will be utilized for Subarea A. There are also existing private, homeowner wells that withdraw their water supply from Subarea A. Table 4-2 of the DWP's 2006 Water Master Plan, prepared by CDM Engineering, shows the "Private Wells Production" within Subarea A as 5 acre-feet per year of groundwater production. Subtracting the 5 acre-feet of groundwater production from the minimum recharge for Subarea A of 14 acre-feet leaves 9 acre-feet available to supply the Proposed Alternative Project. Existing Project Well FP-2 is capable of pumping the 5.6 gallons per minute that will produce the 9 acre-feet per year of groundwater production from Subarea A and will also produce the Maximum Day Demand of 15.27 gpm (Geoscience Support Services Inc, 2008, Results of Rehabilitation and Aquifer Testing Moon Camp Well FP2).

The remaining 5 acre-feet per year of Proposed Alternative Project Demand will be supplied from the Grout Creek Groundwater Subunit, Subarea D. Project Well FP-4, which was drilled by the developer in the northwest corner of the project site, will supply the 5 acre-feet per year of groundwater production, which is 3.1 gallons per minute (Harich Enterprises, 2009, Well FP-4 Driller's Report). Thomas Harder Groundwater Consulting noted in its report that the only potential impact from FP-4 would be the draw-down influence onto neighboring private wells as indicated from pump test data. The data indicated that FP-4, at a sustained rate of 3.5 gpm, would result in a 2-foot draw-down in groundwater level for the nearest private well, which is located approximately 250 feet from Well FP-4. The available data on private wells suggests that the nearest private well has a saturated thickness that would be able to accommodate the additional 2-foot draw-down and that pumping from Well FP-4 would not significantly impact the private well's routine operations. Based on these data, mitigation (per the 2009 Water Supply Report) shall be incorporated into the Proposed

Project Alternative that will limit the Proposed Alternative Project's allocation of water supply from Well FP-4 to a maximum of 5 acre-feet per year.

Geoscience (2003) reports the groundwater annual recharge of Grout Creek Subarea D to be between 32 and 99 acre-feet per year, with an estimated annual Maximum Perennial Yield of 66 acre-feet per year. At present, the only groundwater production in this subarea is from 11 private wells and is calculated to be 3 acre-feet per year. The additional 5 acre-feet per year of annual groundwater production from Well FP-4, combined with the existing 3 acre-feet per year of annual groundwater production, results in 8 acre-feet per year of total annual groundwater production, well below the low end of the annual recharge for Subarea D, which is 32-acre-feet per year, and also well below the estimated Maximum Perennial Yield for Subarea D which is 66 acre-feet per year.

Project Well FP-2 was cleaned, rehabilitated and test pumped by Roadrunner Drilling, under the supervision of Geoscience, in July of 2008. Geoscience's August 2008 Report concluded that:

- Well FP-2 has successfully been rehabilitated and its specific capacity restored to near original levels;
- Well FP-2 can yield up to 35 gpm on a long term basis with less than 10 ft of drawdown;
- At the 35 gpm discharge rate, pumping interference with the nearest private well (910 feet to the east of FP2) is expected to be less than 0.3 ft (less than 3.6 inches);
- Groundwater quality data from Well FP-2 indicates the water from the well is suitable for municipal supply; and
- There is no evidence from the Microscopic Particulate Analysis that the ground water produced by Well FP-2 is under the direct influence of surface water in Big Bear Lake.

Thomas Harder, Groundwater Consulting (formerly with Geoscience), stated in his May 1, 2009, letter (Appendix C) that the potential impact of pumping Project Well FP-2 on the surface water of Big Bear Lake would be minimal. The top of perforations for Project Well FP-2 (the area of the well where water is withdrawn from the surrounding soil) occur (begin) approximately 60 feet below ground surface, at an elevation of approximately 6,686 feet above mean sea level (msl). The high surface water elevation in the lake is 6,743 feet msl and the average depth of the lake is 30 feet. Thus, the elevation of the bottom of Big Bear Lake is approximately 27 feet above the top of perforations for Project Well FP-2. The geologic log for Project Well FP-2 shows multiple silt and clay layers between the land surface and top of perforations. If the silt and clay layers extend beneath the lake, they would provide some hydraulic separation between the lake water and aquifer system. While it is possible that some vertical leakage could occur from the lake into the aquifer system of FP-2, the majority of groundwater produced by FP-2 would be from the aquifer underlying Subarea A.

The third existing, on-site well, FP-3, located to the east of the FP-2 well, would not be equipped nor pumped, but will be used as a monitoring well to record groundwater levels.

Groundwater Recharge

Impacts from Project Wells FP-2 and FP-4 will be less than significant as long as mitigation measures established in the Thomas Harder Groundwater Consulting Report are implemented to ensure that annual groundwater production limits for FP-2 are 9 acre-feet per year; and FP-4 are 5 acre-feet per year.

In summary, the Proposed Alternative Project demand is 14 acre-feet per year. Well FP-2 is capable of producing the 5.6 gallons per minute, which is 9 acre-feet per year from North Shore Subunit, Subarea A, and Well FP-4 will produce the 3.1 gallons per minute, which is 5 acre-feet per year from Grout Creek Subunit, Subarea D. Therefore, there is sufficient water available to serve the Proposed Alternative Project, and the impacts in regard to water supply for the Proposed Alternative Project are considered less than significant.

Wastewater

So and Associates Engineers Inc. prepared a wastewater feasibility study for the Proposed Alternative Project (So, April 2007; Appendix G). According to So and Associates, the project would generate approximately 10,750 gallons of effluent per day, with an estimated peak flow of 43,000 gallons per day. According to the study, the existing sewer system has the capacity to service the Proposed Alternative Project.

Before service can be extended to the site, both on and off-site improvements would be necessary. The improvements include an extension of 1,200 linear feet along North Shore Drive to connect to the existing 8-inch collector sewer southwest of the property. Other requirements include that 1) all gravity facilities must be minimum 8-inch diameter; 2) all on-site facilities must meet CSA 53B standards and specifications and construction plans must be submitted for plan check and approval by the District Engineer; and 3) the Applicant will be required to construct 4,400 lineal feet of on-site collector sewer mainlines as shown in Exhibit 2-7, Proposed Sewer Facilities.

The Proposed Alternative Project would convey part of the wastewater flow via gravity sewer to the existing Pump Station B, southeast of the property, as shown in Exhibit 2-7. However, depending upon where houses are built on each lot, some of the lots may require individual, on-site, household pump stations. This will depend on the individual lot design and will be decided at the time each lot is developed. The future homeowner will fund and install the lot-specific sewer improvements.

The Applicant would construct and pay for all common sewer infrastructure required for implementing the Proposed Alternative Project. The future homeowners will fund the lot-specific improvements. The future homeowners will pay for the associated connection fees to CSA 53B and BBARWA. The County's local fee for connecting to CSA-53B is $1,358.72 per dwelling unit. This

represents $67,936 in local connection fees for the 50 residential lots in the Proposed Alternative Project. Regional fees are also imposed by BBARWA for sewage treatment and disposal. These fees are assessed at $2,704.99 per dwelling unit, which represents $135,249.50 in regional connection fees for the 50 residential lots in the Proposed Alternative Project.

The sewer line design and connection details must be submitted to the County's Special Districts Department (SDD) for plan check and approval. The Applicant will pay the sewer line design and inspection fees that are related to the common infrastructure. Individual lot owners / home builders do not pay any of these fees. Individual home builders would pay an inspection fee to CSA 53B for the inspection of their house lateral connection to the common infrastructure.

The future residents would pay monthly user fees that offset the sewer system maintenance. Therefore, all project related costs would be paid for by the Applicant and/or the future residents, and the utility providers would not be financially impacted by the future residential development.

The existing sewer system has the capacity to service the 50 residential lots in the Proposed Alternative Project, and the cost of providing service will not impact BBARWA, the County or existing Fawnskin residents. The impacts in regard to sewer service are considered less than significant and no mitigation is required.

Solid Waste

According to the website of the California Integrated Solid Waste Management Board, local residents generate an average of 20.0 pounds of solid waste per household per day. Since the Proposed Alternative Project would have 50 single-family residences, the Proposed Alternative Project could generate as much as 1,000 pounds or one-half ton of solid waste per day.

Solid waste collection within the project area would be provided by Big Bear Disposal, Inc. Waste would be transported to the Big Bear Transfer Station, located on Holcomb Valley Road in Big Bear City, approximately 1.5 miles north of Highway 18. The transfer station is owned and operated by the County of San Bernardino Waste Management Division. From the transfer station, solid waste is transferred to the Barstow Landfill; a County of San Bernardino owned and operated facility. The landfill is currently permitted to receive 750 tons of waste per day. The landfill is currently at approximately 25 percent of the original capacity of 3.58 million cubic yards. Closure is scheduled for May 1, 2012. However, as part of the County's strategy for long-range solid waste disposal, the Barstow Landfill could be expanded onto adjacent county-owned property.

County landfills do not accept hazardous wastes. The County operates regular programs/operations to routinely collect hazardous wastes from residential sources (i.e., residential round-ups, once a month collection locations, etc.). Each new residence is expected to generate approximately 50 pounds of hazardous waste per year, according to data from the State Integrated Waste

Management Board website. All residents, including those within the project site, are expected to take advantage of these programs to a similar degree as existing County residents.

Since the cost is passed down to the residents via monthly service fees and because the landfill has adequate storage capacity, no significant impacts are anticipated with regard to solid waste collection or disposal.

Natural Gas

SGC has indicated that natural gas main pipelines are installed in the right-of-way of SR-38. According to the 2005 Final EIR, the Southwest Gas Corporation has concluded that there is sufficient capacity in their facilities to provide natural gas service to the project area without any significant impact on the environment. As such, extensions to existing facilities would be required in order to provide service to the Proposed Alternative Project. Service would be provided in accordance with SGC's policies and extension rules on file with the California Public Utilities Commission. Future natural gas service to the project area would require coordination with the company's engineering department for a comprehensive plan as to levels of service required.

Because the larger (92-lot) Original Proposed Project would not cause significant impacts, the Proposed Alternative Project, with 46 percent fewer residential units, would also not cause significant impacts. Therefore, implementation of the Proposed Alternative Project would result in a less than significant impact with respect to natural gas service.

There is a natural gas line underneath Big Bear Lake, located to the east of the proposed marina. There has been some public concern regarding this natural gas line and the potential for it to rupture during construction activities in the lake, associated with the construction of the boat launch ramp and placement of the floating docks. The gas line does not pose a threat to public safety, as it is buried, and, therefore, protected from boating activities during low lake levels. Furthermore, no dredging of the lake is proposed for the marina. The only proposed construction that would interfere with the lake is the proposed ramp. However, the ramp would not be located in the area of the natural gas line. Additionally, prior to any excavation, Underground Service Alert must be called and all utilities respond and mark the location of their underground lines. The impacts in this regard are therefore considered less than significant.

Electricity

The Proposed Alternative Project would result in an increased demand for electrical service. Based on a daily average of 16.66 kilowatts per unit, at project buildout the Proposed Alternative Project would utilize 833 kilowatts per day. BVE recently constructed a local power generating station to provide backup power and peak power to supplement the two power lines that feed the valley. According to BVE, service is available and of adequate supplies.

The Applicant will construct and fund all infrastructure related to the Proposed Alternative Project. In addition, the future residents of the site will pay monthly user fees that offset the cost of service and maintenance. Therefore, the impacts in this regard are considered less than significant and no mitigation is required.

4.9.6 - Standard Conditions and Uniform Codes

All utility improvements constructed as part of the Proposed Alternative Project will meet applicable uniform codes (i.e., plumbing, fire, and building), including potable water and sewer systems, electrical cables and wiring, natural gas lines, solid waste containers and enclosures, and telephone/cable lines. The County's development review and construction inspection processes would assure that these improvements are constructed according to appropriate standards.

Water conservation measures recommended by the California Department of Water Resources must be incorporated as appropriate, including but not limited to: (a) low flush toilets of no greater than 1.6 gallons per flush; (b) insulation of hot water lines to provide hot water faster with less waste; and (c) keeping water pressure at 55 pounds psi or less. Some portion of the landscaping, especially shrubs and trees, may be native species or species that are adapted to drought conditions.

The project must comply with energy conservation standards contained in Titles 20 and 24 of the California Code of Regulations, Section 2-5307(b), which is the California Energy Conservation (CEC) Standard for New Buildings. These regulations prohibit the installation of fixtures unless the manufacture has certified to the CEC compliance with the flow rate standards. Title 24, California Code of Regulations Sections 2-5452(i) and (j) addresses pipe installation requirements, which can reduce water use before hot water reaches equipment or fixtures. Title 20, California Code of Regulations Section 1604(f) and 1606(b) are Applicable Efficiency Standards that set the maximum flow rates of all plumbing fixtures and prohibit the sale of non-conforming fixtures.

The Applicant or individual property owners would also be responsible for paying applicable utility impact fees charged by various service providers. Payment of these fees helps the local agencies anticipate future demand and establish plans and construct new facilities to serve growth.

4.9.7 - Project Design Features

The Proposed Alternative Project includes master water and sewer plans that will provide comprehensive utility systems. All utility improvements will be constructed to the satisfaction of the County Public Works Department; and SWG, Bear Valley Electric and BBARWA, CSA 53B, CSA 53C and Big Bear Lake Department of Water and Power will maintain their respective utility lines within the public right-of-way, as appropriate. The Applicant will install all common infrastructures necessary to support the proposed residential development, including the required wastewater improvements, water mains, and fire hydrants.

4.9.8 - Mitigation Measures

Project design features and standard conditions and uniform code reduce many potential impacts to less than significant levels. However, the following mitigation measures are recommended in order to mitigate utility impacts associated with the Proposed Alternative Project to the maximum extent feasible.

Water

U-1a The Moon Camp Home Owners Association shall create a "conservation guidelines" booklet that outlines the following measures:

- All indoor water fixtures shall be low flow / low flush.
- Landscape shall not be irrigated between the hours of 9:00 a.m. and 6:00 p.m.
- Residences, buildings, and premises shall be limited to watering landscaping every other day.
- Water from landscape irrigation shall not be allowed to run off into streets or other paved areas.
- Water leaks are not permitted and must be repaired as soon as practicable.
- Sidewalks, paved driveways, and parkways shall not be washed off with hoses, except as required for sanitary purposes.
- Washing non-commercial vehicles (cars, boats RVs) is permitted; however, it shall only be permitted with an automatic shut-off nozzle on a hose, or with a bucket.
- Turf landscaping shall be limited to 500 square feet on a parcel or lot unless the water purveyor's regulations allow additional turf area.
- Turf irrigation shall include an automatic controller that incorporates evapo-transpiration and rain shutoff features.
- Sprinklers are only allowed on turf. All other landscape plantings must be irrigated with efficient, low water use devices, such as, drip systems or bubblers.
- All outdoor irrigation systems shall be shut off and winterized between November 1st and April 1st of each year.
- A model landscaping and irrigation guide shall be prepared for the tract and required by homeowner association rules. The guide shall identify the following conservation measures: Landscaping shall include a plant palate that emphasizes Xeriscape, native plants and cultivars that are suitable for the mountain climate. Plant materials shall be low water consuming and fire

resistant. Irrigation shall limit aerial spray methods and shall emphasize drip and bubbler type emitters. The landscaping guidelines shall be reviewed and approved by the Land Use Services Department. In addition, the project shall comply with the local water agency's Model Landscape and Irrigation Ordinance'.

- The Project shall comply with the local water agency's "Model Landscape and Irrigation" ordinance.

U-1b Pumping and extraction of groundwater shall be limited to 9 acre-feet per year for Well FP-2, 0 acre-feet per year for Well FP-3, and 5 acre-feet per year for Well FP-4. If the water purveyor desires to extract groundwater from Well FP-2 in excess of 9 acre-feet per year, the purveyor shall conduct an independent environmental analysis to identify and consider potential impacts at that time.

U-1c The grant deeds transferring ownership of Wells FP-2, FP-3 and FP-4 shall include the pumping and extraction limitations included in Mitigation Measure U-1b. The grant deeds shall also state that the water purveyor, on January 1st of each year, shall report the amount of the prior year's annual groundwater production from Wells FP-2, FP-3 and FP-4 to the County Land Use Services Department and the County Health Department.

Wastewater

U-2 Prior to issuance of building permits, the Applicant shall fund all on-site and off-site sewer improvements required to support development of the project site. Such improvements shall be to the satisfaction of the County Service Area (CSA)53B.

U-3 Prior to issuance of building permits, the Applicant shall provide evidence to the County of San Bernardino that the BBARWA has sufficient transmission and treatment plant capacity to accept sewage flows from the project site.

4.9.9 - Level of Significance after Mitigation

The utility impacts of the Proposed Alternative Project would be less than significant with mitigation.

SECTION 5: CUMULATIVE IMPACTS

5.1 - Introduction

California Environmental Quality Act (CEQA) Guidelines (Section 15130) require identification of related projects, both public and private, that together with a proposed project could have cumulative impacts on the environment. There are several development projects in the general vicinity of the Proposed Alternative Project that may produce a cumulative impact on the community. These projects may produce community-wide and area-wide cumulative impacts related to traffic, noise, and air quality, in addition to various site-specific impacts.

CEQA Guidelines Section 15604(i), which is the same as CEQA Statute Section 21083(b), includes a vague definition of "cumulatively considerable." Project contributions to cumulative impacts are "considerable" when viewed in connection with the effects of past, current, and "probable future projects." This information will be used as guidance in evaluating the cumulative impacts of planned growth and the Proposed Alternative Project's contributions to those impacts. For all environmental issues, the area of consideration of potential cumulative impacts will be specified so the contribution of the Proposed Alternative Project to cumulative impacts can be clearly identified.

5.2 - Cumulative Projects

CEQA Guidelines Section 15130 requires identification of related projects, both public and private, that together with a proposed project could have cumulative impacts on the environment. The County of San Bernardino and City of Big Bear Lake have identified 17 development projects, in addition to the Proposed Alternative Project, that are either pending or recently approved, or in process of being constructed within the Proposed Alternative Project area. These "cumulative" projects represent a total of 957 residential units, 146 hotel rooms, approximately 40,000 square feet of retail space, 6,300 square feet of office space, a 20,000 square-foot church, and 3 acres of mini-storage. Table 5-1, Cumulative Project List, summarizes the projects within the study area that could have a direct or connected indirect impact or influence on the project site or surrounding area.

If approved and constructed, these projects could introduce an additional 2,110 residents into the Big Bear Valley. This estimate is based on an average household size of 2.31 persons per household for standard single-family units based on data from the federal census.

Table 5-1: Cumulative Project List

Project Type	Description	Number of Units/Size	Population
County of San Bernardino			
TT 16771	SFR	242	559
TT 16934	SFR	228	527
TT 17217 &TT17022	SFR	53	122
TT 16036	SFR	116	268
TT 14916	SFR	51	118
TT 16980	SFR	15	35
TT 1776H	SFR	10	23
TT 16749	SFR	86	199
TT 17201	SFR	66	152
Total (County of San Bernardino)		**867 Residential Lots**	**2,003**
City of Big Bear Lake			
Hilton Garden Inn	Hotel	91 Rooms	- -
Mixed use Development	Retail	22,500 square feet	9
	Office	6,300 square feet	
	Residential	10 acres/4 lots	
Residential	SFR	8 lots	18
Residential	Condominiums	78 dwelling units	180
Mixed use Development	Hotel	55 rooms	- -
	Retail	10,000 square feet	- -
	Fast Food	2,500 square feet	- -
World Harvest Faith Center	Church	20,000 square feet	- -
Boat Parts Retail & Service	Boat/Auto Care Center	4,375 square feet	- -
Storage Yard	Mini Storage	3 acres	- -
Total (Big Bear)		**12 SFR/78 MFR, 65,675 square feet of mixed use, 3 acres of storage, 149 hotel rooms**	**207**
TOTAL		**879 SFR 78 MFR 65,675 square feet of mixed use 3 acres of storage 146 hotel rooms**	**2,210**

The potential cumulative impacts of these developments are evaluated herein. Each environmental issue analyzed previously in Sections 4.1 through 4.9 of this Revised and Recirculated Draft Environmental Impact Report (EIR) is also evaluated here in terms of cumulative impacts.

5.3 - Cumulative Impacts Analysis

Cumulative impacts related to Geology and Soils, Public Safety, and Cultural Resources were determined to have been adequately addressed in the 2005 Final EIR and are not re-analyzed in this Revised and Recirculated Draft EIR. Please refer to the 2005 Final EIR for a discussion of cumulative impacts to these areas.

5.3.1 - Aesthetics/ Light and Glare

Build-out of the Proposed Alternative Project, together with cumulative projects, may alter the nature and appearance of the area and contribute to the loss of undeveloped areas. As development occurs in the Fawnskin area as well as the broader Big Bear Valley, residents and visitors in the area would notice the visual effects of development projects. Construction of currently approved and pending projects in the vicinity would permanently alter the nature and appearance of the area through the loss of undeveloped properties. Security and street lighting would introduce some light and glare to the area; however with adherence to development code requirements, these impacts can be minimized. The significance of these visual/aesthetic changes is difficult to determine, since aesthetic value is subjectively determined and potential impacts are site-specific, and impacts are typically evaluated on a project-by-project basis.

The County of San Bernardino identifies the Proposed Alternative Project site within a Scenic Resources (SR) Overlay District and SR-38 as a County Scenic Highway. The State of California has also designated this portion of SR-38 as a "Scenic Highway" and the U.S. Forest Service (USFS) has designated SR-38 as a "scenic byway." The intent of the SR Overlay District is to "provide development standards that will protect, preserve, and enhance the aesthetic resources of the County." Thus, cumulative impacts in this area can be mitigated to less than significant levels by following the development standards of the SR Overlay District for building and structure placement, project design, access drives, landscaping, roads, undergrounding of utilities, grading and signs, in addition to the use of building materials that are consistent with the general character of the area, and proper lighting techniques to direct light on-site and away from adjacent properties. Although no mitigation measures were specifically recommended to reduce cumulative impacts, Mitigation Measures A-1a through A-4f are required to further reduce the Proposed Alternative Project's impacts to Aesthetics/Light and Glare.

Project-specific impacts to Aesthetics/Light and Glare will be reduced to less than significant levels by the incorporation of mitigation measures, along with standard conditions and Conditions, Covenants & Restrictions (CC&Rs). Similarly, the Proposed Project Alternative's contribution to

Aesthetics/Light and Glare is less than significant when considered in connection with cumulative projects and will not result in a significant cumulative impact.

5.3.2 - Air Quality

The requirement for the assessment of cumulative impacts to Air Quality has evolved recently and now includes discussions of greenhouse gas emissions and global warming. There are no published thresholds for measuring the significance of a project's cumulative contribution to global climate change. Global climate change is an international phenomenon; the regulatory background and scientific data are changing rapidly. However, it is reasonable to apply the same requirements used for criteria pollutants; that significance is when a project results in a cumulatively considerable net increase of greenhouse gases (GHG).

The following four-tiered approach was used to assess cumulative air quality impacts.

- Consistency with the South Coast Air Quality Management District (SCAQMD) project specific thresholds for construction and operation;
- Project consistency with existing air quality plans;
- Assessment of the cumulative health effects of the pollutants; and
- Cumulative impact of global climate change.

Cumulative Health Impacts

The South Coast Air Basin is in non-attainment for ozone, 10-micron or less particulate matter (PM_{10}), Fine particulate matter ($PM_{2.5}$), and Carbon monoxide (CO), which means that the background levels of those pollutants are at times higher than the ambient air quality standards. The air quality standards were set to protect the health of sensitive individuals (i.e., elderly, children, and the sick). Therefore, when the concentration of those pollutants exceed the standard, it is likely that some of the sensitive individuals of the population experience health effects.

The localized significance analysis (Section 4.2, Air Quality) demonstrated that during construction activities, no localized significance threshold was expected to be exceeded; therefore, the emissions of particulate matter, primarily in the form of fugitive dust, would not result in a significant cumulative health impact.

Long-term operational emissions are not expected to exceed SCAQMD's significance thresholds. Reactive organic gases (ROG) and Nitrogen oxides (NO_X) are precursors to ozone; and because ozone is a secondary pollutant (it is not emitted directly but formed by chemical reactions in the air), it can be formed miles downwind of the project site. Proposed Alternative Project emissions of VOC and NO_X may still contribute to the background concentration of ozone but such contributions would not be considered cumulatively considerable.

The combination of ozone and PM_{10} can aggravate health effects. $PM_{2.5}$ is a component of PM_{10}. The ambient air quality standard for both PM_{10} and $PM_{2.5}$ are exceeded in the Basin. Operational

emissions of PM_{10} and $PM_{2.5}$ are not expected to exceed the regional significance threshold. Therefore, Proposed Alternative Project emissions may contribute to the background of those pollutants, but such contributions would not be considered cumulatively considerable.

Long-term health effects from residential woodburning are not expected to create a significant impact. Implementation of Mitigation Measures AQ-3 and AQ-4 (identified in Section 4.2, Air Quality) would create an environment where woodburning activities may contribute to the local wood smoke, but such contribution would not be considered cumulatively considerable. Thus, the Proposed Alternative Project's impact to Air Quality is less than significant when considered in connection with cumulative projects.

Greenhouse Gas (GHG) Emissions/Global Climate Change

As demonstrated in the Project Air Quality Analysis (refer to Appendix A) and the information presented in Section 4.2, the Proposed Alternative Project would not conflict with the attainment of the state's goals of reducing greenhouse gas emissions as dictated by AB 32. In addition, the Proposed Alternative Project will include design features that will further reduce the Proposed Alternative Project's contribution to global climate change. As such, the Proposed Alternative Project's potential to contribute considerably (either individually or cumulatively) to a global climate change impact through GHG emissions is less than significant.

5.3.3 - Biological Resources

Significant and unavoidable impacts from development of the Proposed Alternative Project related to Biological Resources have been identified for impacts to bald eagle. Mitigation Measure BR-4 requires that eagle perch locations be preserved in place upon completion of the Proposed Alternative Project, and that any development that may occur within the Proposed Alternative Project site and in the individual lots must avoid impacts to trees larger than 24 inches dbh and their root structures. Still, even with the implementation of Mitigation Measure BR-4 and the establishment of nearly 6 acres of Conservation/Open Space set aside, some trees will still need to be removed from the Proposed Alternative Project site to allow for the development of the 50 residential lots. This is considered a significant and unavoidable project-specific, as well as cumulative, impact.

Six special status plant species have been observed on the Proposed Alternative Project site: ash-gray Indian paintbrush; Parish's rock cress; Big Bear Valley woollypod; Bear valley phlox; purple monkeyflower; and silver-haired ivesia. Impacts to special status plants and plant communities will be reduced by implementation of Mitigation Measures BR-1a and BR-1b, which require creation of a 4.91-acre on-site conservation easement to preserve the 0.69-acre Pebble Plain and 4.91 acres of occupied ash-grey Indian paintbrush habitat, and creation of the 10-acre Dixie Lee Lane Pebble Plain Habitat conservation easement that will mitigate the remaining impacts to ash-grey Indian paintbrush at a 3:1 ratio. Implementation of these Mitigation Measures will reduce impacts to plant species to less than significant levels. When considered in connection with the development of the cumulative

projects, the impacts of the Proposed Alternative Project on special status plant species are less than significant.

A total of 0.69 acres of pebble plain habitat occurs within the Proposed Alternative Project site; however, all of this habitat would be permanently preserved in an Open Space/Conservation easement consisting of a 4.91-acre easement (Lot A) at the westerly end of the Proposed Alternative Project site. The 0.69-acre site is near the center of the easement area, which would be buffered from future development of adjacent residential lots. Approximately 1,511 acres of pebble plain are known to exit in the San Bernardino Mountains (Krantz, 2008), 60 percent (906 acres) of which occurs on public lands. Development of the site would not result in the removal of any of the pebble plain that occurs on the project site. Further, in addition to the 0.69 acre of pebble plain habitat that will be preserved by Proposed Alternative Project implementation, an additional 10 acres of pebble plain habitat will be preserved through the purchase of the off-site mitigation area. When considered in connection with the development of the cumulative projects, the impacts of the Proposed Alternative Project on pebble plain habitat are less than significant.

A total of 50.72 acres of Jeffrey pine forest, including 13.81 acres of open Jeffrey pine forest, would be impacted by Proposed Alternative Project implementation. Approximately 58,526 acres of Jeffrey pine forest occurs in the San Bernardino National Forest and 141,604 acres in the Cleveland, San Bernardino, Angeles and Los Padres National Forests, collectively. Approximately 4.2 acres of open Jeffrey pine forest will be permanently preserved by a conservation easement. Impacts on this vegetation type would be considered cumulatively less than significant since this vegetation type is common throughout the San Bernardino Mountains and other mountain ranges in the region.

A total of 4.0 acres of ruderal lake shoreline would be impacted by Proposed Alternative Project implementation. Man-made lakes are essentially distinct ecosystems, with an aquatic fauna and flora that bears little resemblance to what naturally occurs in the streams that formed them. Impacts on this vegetation type would be considered less than significant.

A total of 2.82 acres of disturbed vegetation in developed areas (SR-38) would be impacted by Proposed Alternative Project implementation. Impacts on this vegetation type would not be considered significant since this vegetation type is considered to have a low biological value.

In sum, when considered in conjunction with the other cumulative projects, the Proposed Alternative Project would add incrementally to the cumulative significant impact on the bald eagle. Accordingly, cumulative impacts to the bald eagle are considered significant. The Proposed Alternative Project would not result in a significant cumulative impact to any other biological resource.

5.3.4 - Hydrology and Water Quality

For purposes of the drainage and water quality analysis, cumulative impacts are considered for projects in the same watershed as the project site, which would also drain into Big Bear Lake. For

purposes of this discussion, it is assumed that the list of cumulative proposed projects would all drain into the lake. The County of San Bernardino follows State standards for water quality. During construction, projects will be required to obtain coverage under the State's General Permit for Construction Activities that is administered by the California Regional Water Quality Control Board (RWQCB). The Proposed Alternative Project will obtain coverage under the statewide National Pollutant Discharge Elimination System (NPDES) permit for construction activities and develop and implement a Stormwater Pollution Prevention Program (SWPPP) to control erosion and protect water quality during the construction phase of the Proposed Alternative Project, as well as operate under an approved WQMP. The SWPPP must also implement other applicable BMPs as needed to keep pollutants away from stormwater. The SWPPP must also identify additional applicable measures taken during the storm season and when storms are anticipated.

It is assumed that any of the cumulative proposed projects would be required to comply with the same standards for urban runoff as outlined in the Santa Ana Region's NPDES Permit and Water Discharge Requirements, as a condition of approval. Each project would be required to prepare and implement a SWPPP for construction and a Water Quality Management Plan (WQMP) for long-term conditions after construction. Therefore, with adherence to the requirements of each project's respective NPDES permit and SWPPP requirements, no cumulative impacts would occur as a result of the Proposed Alternative Project.

5.3.5 - Land Use and Planning

Development of the site under the Proposed Alternative Project would not result in any cumulative significant land use impacts. The Proposed Alternative Project involves a request for a General Plan Amendment from Rural Living – 40 (minimum 40-acre lot sizes) (RL-40) to Single Family Residential with 20,000-square-foot minimum lot sizes (RS-20M). Upon approval of the General Plan Amendment, the Proposed Alternative Project will be developed consistent with the goals and policies of the Bear Valley Community Plan and the San Bernardino National Forest Land Use Management Plan and does not conflict with any applicable Habitat Conservation Plan (HCP) or any Community Conservation Plan.

The current land use designation of the Proposed Alternative Project site, RL-40, is a remnant of the previous General Plan. It appears that subsequent development on adjacent and nearby private properties in the Fawnskin community has converted to a higher density on a tract by tract basis, and now the Proposed Alternative Project site is bordered on the west, northwest and southeast by development with a typical residential lot density of 7,200 square feet or greater. Thus, the Proposed Alternative Project will have a lower density than other residential uses in the immediate area.

It is assumed that as other projects are implemented in the area, each new project will undergo the same review process as the Proposed Alternative Project, in order to preclude potential land use compatibility issues and planning policy conflicts. It is further assumed that cumulative development will progress in accordance with the City of Big Bear Lake and County of San Bernardino General

Plan and Development Code, and that each individual project would be analyzed independent of other land uses, as well as within the context of existing and planned developments, to ensure that the goals, objectives and policies of the General Plans are consistently upheld. Thus, the Proposed Project Alternative's impacts on Land Use and Planning are less than significant when considered in connection with cumulative projects, and will not result in a significant cumulative impact.

5.3.6 - Noise

Implementation of the Proposed Alternative Project, when combined with development of cumulative projects, would contribute to ambient noise levels in the vicinity. This increase would be due to both vehicular traffic noises along local roadways; noise associated with boating activities on the lake; and stationary noise sources from residences and other proposed land uses. The Proposed Alternative Project is required to reduce noise impacts to comply with County noise standards and to adhere to Development Code and General Plan requirements. The analysis of the Proposed Alternative Project showed that development of the project site would not contribute to ambient noise in excess of County noise standards and, therefore, does not contribute to a significant cumulative noise impact. The evaluation of noise impacts is typically determined on a project-by-project basis in order to focus mitigation on a particular noise source. As such, future development proposals within the County would require separate discretionary approval and CEQA assessment, which would address potential noise impacts and identify appropriate attenuation measures where appropriate. Thus, the Proposed Project Alternative's contribution to Noise is less than significant when considered in connection with cumulative projects, and will not result in a significant cumulative impact.

5.3.7 - Public Services

The Proposed Alternative Project site is located in an area that is served by existing public services. Service providers have indicated that the Proposed Alternative Project's incremental impacts can be sufficiently mitigated through various fire protection measures, design features, an Emergency Operations plan, implementation of mitigation measures and the payment of development impact fees and property taxes by future homeowners. Therefore, the Proposed Alternative Project would not result in a significant impact to Public Services when considered in connection with cumulative projects and will not result in a significant cumulative impact.

5.3.8 - Traffic and Circulation

The Proposed Alternative Project would generate approximately 51 trips during AM peak hours, 51 trips during PM peak hours, and a total of 479 daily trips. The San Bernardino County Congestion Management Program (CMP) does not require analysis for projects that generate less than 250 peak hour trips; however, a long-range traffic analysis has been prepared for the Proposed Alternative Project.

A total of 17 cumulative projects were identified by the County of San Bernardino and City of Big Bear staff as affecting the study intersections. Other developments are projected to generate 15,111

trip-ends per day, with 1,455 vehicles per hour during the AM peak hour and 1,455 vehicles per hour during the PM peak hour.

For 2010 With Project traffic conditions, including traffic generated by cumulative projects, no new traffic signals are projected to be warranted as compared to 2010 Without Project conditions. The following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday mid-day peak hours:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

These intersections will continue to operate at unacceptable levels without improvements, but will improve to acceptable levels with the addition of traffic signals with no significant impact due to the Proposed Alternative Project.

For General Plan Buildout With Project Conditions, the following study area intersections would operate at an unacceptable level of service during both Friday PM and Sunday mid-day peak hours without improvements:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

Driveway #1 (NS) at:

- North Shore Drive (SR-38) (EW)

Driveway #2 (NS) at:

- North Shore Drive (SR-38) (EW)

Traffic improvements are needed for existing conditions and projected conditions whether or not this Proposed Alternative Project is implemented. If needed improvements are installed, implementation of this Proposed Alternative Project will not significantly reduce the level of service off-site. Nevertheless, fair share costs for off-site improvements have been calculated in the amount of $48,921 and will be paid as required by Mitigation Measure T-2.

The installation of on-site improvements as required by Mitigation Measure T-1, and the payment of fair share costs of improvements to impacted off-site roadway intersections will reduce traffic and circulation impacts related to the Proposed Alternative Project to a less than significant level. According to the traffic study, all study intersections are expected to operate at a level of service C or better during peak hours for the scenario analyzed with improvements installed. Other cumulative projects would also presumably be subject to fair share costs for necessary intersection improvements; thus, when considered in connection with cumulative projects, the Proposed Alternative Project's cumulative impact on traffic and circulation is less than significant and will not result in a significant cumulative impact.

5.3.9 - Utilities

The Proposed Alternative Project site is located in an area that is served by utilities and has its own water wells on-site that, when developed, will be turned over to the Department of Water and Power (DWP) or County Service Area 53C to administer. Although water service is not presently provided to the project site, the site is immediately adjacent to the Fawnskin Water System, which is owned and operated by the Big Bear Lake Department of Water and Power (DWP). DWP has conducted a Water Feasibility Study (Alda, 2007) and has provided a conditional will-serve letter to the Applicant. Annexation to the DWP's authorized service area is one of three possible water service alternatives. Other alternatives include ownership and operation of the Proposed Alternative Project's water facilities by County Service Area 53C, or the construction of an on-site, 238,600 gallon reservoir and on-site booster station.

The Water Feasibility Study calculates the Water Demand for the Proposed Alternative Project (50-lot subdivision) as:

- 250 gallons per day per connection x 50 lots = 12,500 gallons per day;
- 12,500 gallons per day x 365 days/year = 4,562,500 gallons per year; and
- 4,562,500 gallons per year is equal to 14 acre-feet per year.

The Water Supply for the Proposed Alternative Project's 14 acre-feet per year demand will come from two groundwater basins. Based on two separate reports prepared by Geoscience in 2000 and 2003 (which are appended to the 2005 Final EIR) the annual groundwater recharge for Subarea A of the North Shore Subunit is between 14 and 44 acre-feet per year. In order to be as conservative as possible, the minimum recharge of 14 acre-feet per year will be utilized for Subarea A. There are also existing private wells that withdraw their water supply from Subarea A. Table 4-2 of DWP's 2006 Water Master Plan, prepared by CDM Engineering, shows the "Private Wells Production" within Subarea A as 5 acre-feet per year. Subtracting the 5 acre-feet from the minimum recharge for Subarea A of 14 acre-feet leaves 9 acre-feet available to supply the Proposed Alternative Project. Existing Project Well FP-2 is capable of pumping the 5.6 gallons per minute that will produce the 9-acre-feet per year from Subarea A and will also produce the Maximum Day Demand of 15.27 gpm

(Geoscience Support Services Inc, 2008, Results of Rehabilitation and Aquifer Testing Moon Camp Well FP2).

The remaining 5 acre-feet of Project Demand will be supplied from the Grout Creek Groundwater Subunit, Subarea D. Well FP-4, which was drilled by the developer in the northwest corner of the project site, will produce the 5 acre-feet per year, which is 3.1 gallons per minute (Harich Enterprises, 2009, Well FP4 Driller's Report). Geoscience (2003) reports the groundwater recharge of Grout Creek Subarea D to be between 32 and 99 acre-feet per year, with a midpoint of 66 acre-feet per year. At present, the only groundwater production in this subarea is from 11 private wells and is calculated to be 3 acre-feet per year. The additional 5 acre-feet per year of pumping from Well FP-4, combined with the existing 3 acre-feet per year of pumping, results in 8 acre-feet per year of total pumping, well below the low end of the recharge for Subarea D, which is 32 acre-feet per year.

The third existing, on-site well, FP-3, located to the east of the FP2 well, would not be equipped nor pumped, but will be used as a monitoring well to record groundwater levels.

In summary, the Proposed Alternative Project demand is 14 acre-feet per year. Well FP-2 is capable of producing 5.6 gallons per minute, which is 9 acre-feet per year from North Shore Subunit, Subarea A, and Well FP-4 will produce the 3.1 gallons per minute, which is 5 acre-feet per year from Grout Creek Subunit, Subarea D. Impacts to groundwater levels from pumping from FP-2 and FP-4 will be less than significant, with implementation of Mitigation Measure U1-b, which establishes annual groundwater production limits for FP-2 as 9 acre-feet per year, and FP-4 as 5 acre-feet per year, and implementation of Mitigation Measure U1-c, which stipulates that the grant deeds transferring ownership of Wells FP-2, FP-3 and FP-4 must include the pumping and extraction limitations included in Mitigation Measure U-1b. In addition, if the water purveyor desires to extract groundwater from Well FP-2 in excess of 9 acre-feet per year, the purveyor must conduct an independent environmental analysis and consider potential impacts at that time. Therefore, there is sufficient water available to serve the Proposed Alternative Project, and the impacts in regard to water supply for the project are considered less than significant with mitigation, when considered in connection with the development of other cumulative projects.

In addition to project design features and standard conditions and uniform code requirements that will be incorporated into the Project, Mitigation Measures U-1 through U-3 will be implemented to further mitigate utility impacts in the areas of solid waste, wastewater, natural gas, and electricity to the maximum extent feasible, which are less than significant with mitigation. Therefore, the Proposed Alternative Project would not add incrementally to a significant cumulative impact to utilities when considered in connection with the development of other cumulative projects and will not result in a significant cumulative impact.

5.3.10 - Summary

The evaluation of cumulative impacts has shown that all impacts associated with the Proposed Alternative Project can be reduced to less than significant levels except for Biological Resources, due to impacts to the bald eagle. When considered in conjunction with the other reasonably foreseeable cumulative projects, the Proposed Alternative Project would add incrementally to the cumulative significant impact to the bald eagle.

SECTION 6: OTHER CEQA ANALYSIS

This section includes a discussion of the following issues required by California Environmental Quality Act (CEQA) to be analyzed in a project Environmental Impact Report (EIR): Significant Environmental Effects Which Cannot be Avoided if the Proposed Project is Implemented; Significant Irreversible Environmental Changes Which Would be Caused by the Proposed Project Should it be Implemented; and Growth Inducing Impacts.

6.1 - Significant Environmental Effects Which Cannot Be Avoided If the Proposed Project Is Implemented

CEQA Guidelines Section 15126.2 (b) requires that an EIR identify any significant environmental impacts that cannot be avoided. The analysis of potential environmental effects that could occur with implementation of the Proposed Alternative Project were addressed in Section 4, Environmental Impact Analysis, of the Revised and Recirculated Draft EIR. The findings of that analysis were that the Proposed Alternative Project - Moon Camp Residential Subdivision, consisting of 50 residential lots on approximately 62.43 acres, including approximately 8.6 acres of open space and other non-residential uses such as flood control and well sites, would have a significant impact on Biological Resources. Specifically, significant and unavoidable impacts to the bald eagle population were identified. Mitigation Measure BR-4 would mitigate impacts by requiring replacement of perch trees at a ratio of 5:1 with the creation of artificial perch trees along the shoreline designated open space. In addition, any development that may occur within the project site and in the individual lots must avoid impacts to these trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. However, because the Proposed Alternative Project would result in a permanent change in existing conditions under which the bald eagle currently occupies the site and vicinity, impacts would remain significant and unavoidable.

No other impacts were identified that could not be mitigated to a less than significant level.

6.2 - Significant Irreversible Environmental Changes Which Would be Caused by the Proposed Project Should it be Implemented

CEQA Guidelines Section 15126.2(c) requires that an EIR include a discussion of Significant Irreversible Environmental Changes associated with the use of non-renewable resources during the initial and continued phases of a project. Approval of the Proposed Alternative Project would cause irreversible environmental changes, as follows:

- Commitment of land, which would be physically altered by the proposed development of the 50 residential lots and related infrastructure;

- Alteration of the project site through the removal of some trees and other vegetation to accommodate grading and construction;
- Commitment to residential and recreational uses which intensify land uses on the project site, thus causing incremental increases in vehicular activity in the surrounding circulation system, resulting in associated increases in air emissions and noise levels; and
- Utilization of various new raw materials, such as lumber, sand and gravel for construction. Some of these resources are already being depleted worldwide. The energy consumed in development and maintaining the site may be considered a permanent investment.

6.3 - Growth Inducing Impacts

CEQA Guidelines Section 15126.2(d) requires the evaluation of growth-inducing impacts of a proposed project. This discussion must address ways a project could encourage economic and population growth, or construction of additional housing in the surrounding area, either directly or indirectly. Also required is a discussion of project characteristics, which may encourage or facilitate other activities that could significantly affect the environment, either individually or cumulatively.

Growth inducement can take many forms. A project can remove barriers, provide access, or eliminate other constraints, which encourage growth that has already been approved and anticipated through the General Plan process. The "planned" growth would be reflected in land use plans that have been developed and approved with underlying assumptions that adequate supporting infrastructure will be built. This is perhaps best described as accommodating or facilitating growth, but for the purpose of this section, the term "inducing" is used.

Implementation of the Proposed Alternative Project would result in the development of up to 50 residential lots. Using the City of Big Bear Lake average household size multiplier of 2.31 persons per household, the Proposed Alternative Project has the potential to increase Fawnskin's population by approximately 115 persons at buildout, or approximately 100 less than under the Original Proposed Project (92 Lots). The potential population growth under the Proposed Alternative Project represents an approximate 28 percent increase over the Community's permanent population estimate of 409 persons (2000) and an approximately 8 percent increase over the Community's peak weekend/holiday period population of 1,428 persons. Implementation of the Proposed Alternative Project, like the Original Proposed Project, would be considered growth inducing inasmuch as it would result in the construction of additional housing, consequentially fostering population growth. However, based on the findings of the Environmental Impact Analysis (Section 4 of the Revised and Recirculated Draft EIR), the Proposed Alternative Project would not require the extension of new infrastructure, since infrastructure is available adjacent to the project site, and utility providers have indicated the ability to serve the site.

Overall, development under the Proposed Alternative Project would not require the substantial development of unplanned/unforeseen support uses and services. As a result, the Proposed Alternative Project would not result in significant growth-inducing impacts.

SECTION 7: ALTERNATIVES TO THE PROPOSED PROJECT

7.1 - Development of Alternatives

California Environmental Quality Act (CEQA) Guidelines Section 15126.6 requires consideration of alternatives to the Original Proposed Project in the Environmental Impact Report (EIR). More specifically, Section 15126.6 prescribes the following:

> **Alternatives to the Proposed Action -** Describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives.
>
> **Purpose -** Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21001.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objective, or would be more costly.
>
> **Selection of a Range of Reasonable Alternatives -** The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination.
>
> **Evaluation of Alternatives -** The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed but in less detail than the significant effects of the project as proposed.
>
> **Rule of Reason -** The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. The EIR need examine in detail only those

alternatives that the lead agency determines could feasibly attain most of the basic objectives of the project while reducing one or more potential significant environmental impacts of the project to less than significant levels.

7.2 - Summary of the Original Proposed Project

In this section, the Original Proposed Project is evaluated against a range of alternatives, including the Proposed Alternative Project that is the subject of this Revised and Recirculated Draft EIR. Table 7-1 shows a summary of the components of the Original Proposed Project.

Table 7-1: Moon Camp Residential Development Project as Originally Proposed

Land Use	Land Plan	
	Acres	Dwelling Units
Residential	60.84	92
Roads to be Developed for the Project[1]	1.97	
Parking	0.45	
Water Wells	0.11	
Open Space/Conservation[2]	0.0	
Minimum Lot Size/land use designation	7,200 sf RS-1	
Marina		103 slips
1-In the Original Proposed Project, all project roads would be private with the exception of SR-38. 2-No conservation areas are associated with the Original Proposed Project.		

7.2.1 - Project Objectives

The range of potential alternatives to the Original Proposed Project must include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The following objectives were identified for the Original Proposed Project:

- Provide up to 92 single-family residential lots to be developed as custom lots in the future;
- Establish single-family residential lots that are part of a planned development;
- Realign State Route 38 (SR-38) to improve the design of the roadway. More specifically, eliminate existing sharp curves of the roadway to minimize conflicts on SR-38 and Project access roads. The proposed roadway realignment would also create the opportunity for lakefront residential lots; and
- Provide marina facilities for residents of Moon Camp to access Big Bear Lake.

7.2.2 - Significant Environmental Impacts of the Original Proposed Project

In evaluating the Original Proposed Project, the 2005 Final EIR concluded that there would be a number of project-related impacts that remained significant and unavoidable. Sections 4.1 through 4.16 of the 2004 Draft EIR evaluated the Original Proposed Project summarized in Table 7-1. The conclusion of the environmental analysis was that the Original Proposed Project would produce significant and unavoidable impacts to the following:

Aesthetics/Light and Glare

Significant and unavoidable impacts related to Aesthetics/Light and Glare were identified for viewshed alterations involving existing residents to the north, east and west of the project site. The proposed 92 dwelling units would adversely impact existing views of the lake and surrounding mountain peaks from some existing adjacent residences. Additionally, significant and unavoidable impacts were identified for views from SR-38, a scenic highway, to the south and from the south shore of Big Bear Lake.

Air Quality

Air quality impacts that would remain significant and unavoidable following mitigation were:

- Construction Activities: Reactive organic gases (ROG) and Nitrogen oxides (NO_x) emissions during site preparation and construction from equipment and vehicles would be significant in the short-term; and

- Project Operations: Long-term use of the project site would result in an overall increase in the local and regional pollutant load due to direct impacts from vehicle emissions, and indirect impacts from electricity and natural gas consumption. Combined mobile and area source emissions would exceed South Coast Air Quality Management District (SCAQMD) thresholds of ROG, Carbon monoxide (CO) and 10-micron or less particulate matter (PM_{10}).

Biological Resources

Project implementation would affect species identified as special status. Implementation of recommended mitigation measures would reduce impacts to less than significant levels with the exception of the bald eagle. Impacts to this species were considered to be significant and unavoidable due to short-term construction noise and long-term residential noise, as well as the removal of potential perch trees, particularly in the westerly portion of the project site.

Hydrology and Drainage

Due to potential overdraft conditions (resulting from the 92 lots) for the groundwater basin associated with the North Shore Hydrologic Subunit, project and cumulative impacts were considered to be significant and unavoidable.

Public Services and Utilities

Due to the inability of water providers to confirm service to the Original Proposed Project, the project impacts, as well as cumulative impacts, were considered to be significant and unavoidable. This conclusion was further supported by the significant and unavoidable conclusion cited in Section 5.11, Hydrology and Drainage, due to potential overdraft conditions for the groundwater basin associated with the North Shore Hydrologic Subunit.

Based on the aforementioned guidelines, several alternatives were developed to reduce or eliminate these significant impacts. In addition to a "No Project" alternative, several different land use alternatives are evaluated in the 2005 Final EIR. Each intended to reduce potential project impacts that are of greatest concern to local residents and local governing agencies.

Subsequent to the circulation of the 2005 Final EIR, and partially in response to public comments received on the document, the Applicant made the decision to consider an alternative that would reduce the impacts that remained significant and unavoidable, and to address other concerns raised in comments received on the 2005 Final EIR. The Proposed Alternative Project, which is the subject of this Revised and Recirculated Draft EIR, is considered herein along with the other alternatives evaluated in the relation to the Original Proposed Project.

7.3 - No Project / No Development Alternative

7.3.1 - Description of Alternative

CEQA requires that a specific "No Project" alternative shall be evaluated along with its impacts compared to the proposed project. The "No Project" analysis essentially evaluates existing conditions on the site. Under this alternative, existing uses on the property would remain as is and the site would not be developed. Assuming that the site remains undeveloped, all significant project-specific impacts will be avoided. However, according to CEQA, if the environmentally superior alternative is the "No Project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

7.3.2 - Evaluation of Impacts Compared to the Original Proposed Project

Aesthetics

The aesthetic impacts associated with the Original Proposed Project would be significant and unavoidable. With the No Project alternative, the visual character of the site, which consists of undeveloped forested land, would remain unchanged, and no site grading would occur. Existing views of Big Bear Lake and the distant mountain ranges to the south would not be obstructed from the project site, which includes views from SR-38. The highway would not be realigned and no lakefront lots that would disrupt views of the lake from the highway would be developed. In addition, there would be no lighting impacts, as no new light sources would be introduced onto the project site.

Therefore, compared to the Original Proposed Project, the No Project/No Development Alternative would be considered environmentally superior.

Agricultural Resources

Impacts to agricultural resources would be less than significant with the Original Proposed Project, because no agricultural use of the site has previously occurred and the site is not designated as prime farmland. Similar to the Original Proposed Project, the No Project / No Development Alternative would not affect agricultural resources.

Air Quality

The air quality impacts (short-and long-term) associated with the Original Proposed Project would be significant and unavoidable. With the No Project Alternative, air quality impacts would be eliminated, as no new emissions sources would be introduced onto the project site via increased traffic, wood burning fireplaces/stoves, etc.

Biological Resources

The Original Proposed Project would have significant and unavoidable impacts related to biological resources, specifically for bald eagle perch sites. There would be no impacts to biological resources with the No Project/No Development Alternative, because no habitat would be disturbed. Therefore, the No Project/No Development Alternative would be considered environmentally superior to the Original Proposed Project.

Cultural Resources

Although with the Original Proposed Project the impacts to cultural resources would be less than significant with mitigation, there would be no impacts to cultural resources with the No Project/No Development Alternative. Therefore, the No Project/No Development Alternative would be considered environmentally superior to the Original Proposed Project.

Geology and Soils

With implementation of mitigation measures, standard regulations and Uniform Building Code (UBC), the impacts to geologic resources would be less than significant for the Original Proposed Project. The No Project/No Development Alternative would not involve development within the project area. Consequently, no new structures would be subject to seismic hazards, such as ground shaking or seismically induced settling, and no grading impacts could occur. Compared to the Original Proposed Project, the No Project/No Development Alternative would be considered environmentally superior.

Hazards

Although the hazards and hazardous materials impacts would be less than significant with the Original Proposed Project, there would be no hazards and hazardous materials impacts with the No Project/No Development Alternative.

Hydrology (Drainage and Water Quality)

The impacts to hydrology would be significant for the Original Proposed Project. The No Project/No Development Alternative would not develop the project area. Thus, no groundwater source would be extracted and no new sources of stormwater runoff would be created. Compared to the Original Proposed Project, the No Project/No Development Alternative would be environmentally superior.

Land Use and Relevant Planning

The land use impacts would be less than significant for the Original Proposed Project. According to the County of San Bernardino General Plan Map, the project site is designated as Rural Living (RL-40). Under the No Project/No Development Alternative, no development would occur onsite. The existing General Plan designation (RL-40) would remain and an amendment to the Official Land Use District would not be required. With no development occurring within the project site, it would remain in its existing undeveloped condition.

Mineral Resources

The site is not within an area designated by the State for locally important mineral resources and it does not lie within the County of San Bernardino's Mineral Resource Zone. No impacts to mineral resources would occur as a result of the project's implementation.

Noise

The noise impacts associated with the Original Proposed Project would be less than significant with mitigation. However, the noise increases created by project-related traffic and watercraft on Big Bear Lake would not occur under the No Project Alternative.

Population and Housing

Although the impacts to Population and Housing would be less than significant with the Original Proposed Project, there would be no impacts with the No Project/No Development Alternative.

Public Services

The public services impacts associated with the Original Proposed Project would be less than significant.

Fire and Police Protection. The No Project/No Development Alternative would not involve new residences; thus, no new demand for fire and police protection services over existing conditions would be required.

Schools. The No Project/No Development Alternative would not generate additional schoolchildren and would not place demands on the school district serving the site. Thus, the No Project Alternative would not strain current educational resources.

Libraries. The No Project/No Development Alternative would not generate additional residents and would not place demands on libraries serving the project site. Thus, the No Project Alternative would not impact current resources.

Recreation

Although the recreation impacts would be less than significant with the Original Proposed Project, there would be no recreation impacts with the No Project/No Development Alternative. Since no new residents would be generated by the No Project Alternative, no new demands would be placed on Big Bear Lake or local and regional park facilities in the area. The No Project Alternative would retain existing on-site paths/trail, although as the project site is private property, these paths/trails are unauthorized and public access on the site and to the lakefront would not be assured since the project site is private property.

Traffic and Circulation

The traffic impacts associated with the Original Proposed Project would be less than significant with mitigation. The No Project/No Development Alternative would not result in the realignment of SR-38 and would not create new roads within the project area. The No Project Alternative would not increase project-related traffic above current levels.

Utilities

Water. The utility impacts associated with the Original Proposed Project would be significant and unavoidable for water services. Under the No Project/No Development Alternative the project site would not be developed. Consequently, the need to develop a water source on-site and extend water lines to the project site would not occur under the No Project Alternative.

Sewer. The utility impacts associated with the Original Proposed Project would be less than significant for sewer services. Under the No Project/No Development Alternative the project site would not be developed. Consequently, the need to extend sewer lines to the project site would not occur under the No Project Alternative.

Solid Waste. The utility impacts associated with the Original Proposed Project would be less than significant for solid waste services. The No Project/No Development Alternative would not produce any solid waste that could not impact existing County landfills. The No Project/No Development Alternative would be considered environmentally superior to the Original Proposed Project.

Utilities. The utility impacts associated with the Original Proposed Project would be less than significant for other utility services, like natural gas and electricity services. The No Project/No Development Alternative would not increase the demand for utility services beyond existing levels.

7.3.3 - Ability to Meet Project Objectives

The No Project/No Development Alternative would not have an impact on the environment because no development of the site would occur. The No Project Alternative would avoid any potential impacts resulting from construction and operation of the Original Proposed Project. However, the No Project Alternative is not consistent with the primary project objectives, which are to provide single-family residential lots to be developed with custom homes and to realign SR-38 to allow lakefront homes and a private marina for homeowners use.

7.3.4 - Summary

The No Project Alternative is the environmentally superior to the Original Proposed Project, as all project specific impacts would be avoided. However, according to CEQA, if the environmentally superior alternative is the "no project" alternative, an EIR shall also identify an environmentally superior alternative among the other alternatives.

7.4 - No Project / Existing Designation Alternative

7.4.1 - Description of Alternative

Implementation of the No Project/Existing Designation Alternative would be in accordance with the existing Official Land Use District Rural Living-40 (40-acre minimum lot size). At 62.43 acres, the site could be developed with up to 1.5 residential lots. Although only one dwelling unit could be realized within the site, for the purpose of this discussion, 1.5 units will be used. This Alternative would be less intensive than the Original Proposed Project. Approximately three persons (1.5 housing units x 2.31 persons/household) would be added to the population of the Community of Fawnskin. It is further noted that in addition to a single-residential structure, other uses can be allowed including those in the "Additional Uses" section of the County Development Code, subject to a Conditional Use Permit. The following discussion evaluates the potential environmental impacts associated with the No Project/Existing Designation Alternative as compared to impacts from the Original Proposed Project.

7.4.2 - Evaluation of Impacts Compared to the Original Proposed Project

Aesthetics

The aesthetic impacts associated with the Original Proposed Project would be significant and unavoidable. The visual character of the site, which consists of undeveloped forest land, would be slightly modified under the No Project/Existing Designation Alternative. Given that this Alternative proposes only 1.5 residential lots, no marina and no realignment of SR-38, fewer impacts are anticipated with respect to landform alteration, aesthetics, light and glare. This Alternative would remove substantially fewer trees. With the No Project/Existing Alternative, SR-38 would not be realigned and the area would largely maintain the views of Big Bear Lake and distant mountain

ranges to the south. Big Bear Lake would remain in its current aesthetic condition, as no recreational facilities on the lake would occur with this Alternative.

Agricultural Resources

Impacts to agricultural resources would be less than significant with the Original Proposed Project, because no agricultural use of the site has previously occurred and the site is not designated as prime farmland. Therefore, this Alternative would similarly not affect agricultural resources.

Air Quality

The air quality impacts (short-and long-term) associated with the Original Proposed Project would be significant and unavoidable. With this Alternative, fewer vehicular trips would be generated, which would also produce less mobile and energy source emissions. With fewer homes and residents, fewer emissions would be generated. This Alternative would result in less local and regional air pollutant emissions. Additionally, construction-related emissions from the realignment of SR-38 would not occur with this Alternative.

Biological Resources

The Original Proposed Project would have significant and unavoidable impacts related to biological resources, specifically for bald eagle perch sites. With the development of only 1.5 residential lots, the No Project/Existing Designation Alternative would slightly impact existing biological resources. This Alternative would substantially reduce the impacts to habitat (perch trees for the bald eagle).

Cultural Resources

Although with the Original Proposed Project, the impacts to cultural resources would be less than significant with mitigation, and there would be even fewer impacts to cultural resources with the No Project/Existing Designation Alternative because less land would be disturbed.

Geology and Soils

With implementation of mitigation measures, standard regulations and UBC, the impacts to geologic resources would be less than significant for the Original Proposed Project. Under this Alternative, less residents and structures would be exposed to seismic hazards. The Original Proposed Project would involve grading for the realignment of SR-38 and for structures to the north and south (lakefront) of SR-38. Grading required for this Alternative would occur on a much smaller scale and only for development of 1.5 residential lots.

Hazards and Hazardous Materials

Although the hazards and hazardous materials impacts would be less than significant with the Original Proposed Project, there would be even fewer hazards and hazardous materials impacts with the No Project/Existing Designation Alternative.

Hydrology (Drainage and Water Quality)

The impacts to hydrology would be for the Original Proposed Project. The No Project/Existing Designation Alternative would involve less development in the project area. Therefore, the amount of impermeable surface area (i.e., roads, rooftops, driveways, etc) would be greatly reduced with this Alternative. Additionally, this Alternative would involve fewer residences and vehicles on-site, thus reducing sources of stormwater pollution runoff. Compared to the Original Proposed Project, the No Project/Existing Designation Alternative would be considered environmentally superior.

Land Use and Relevant Planning

The land use impacts would be less than significant for the Original Proposed Project with adherence to development standards associated with the land use designation of low-density residential (7,200-square-foot lots). Currently, the project site is designated as RL-40, with minimum 40-acre lots. Under the No Project/Existing Designation Alternative, only 1.5 dwelling units would be allowed. Under this Alternative, the existing General Plan designation (RL-40) would remain and an amendment to the Official Land Use District would not be required.

Mineral Resources

The site is not within an area designated by the State for locally important mineral resources and it does not lie within the County of San Bernardino's Mineral Resource Zone. No impacts to mineral resources would occur if the site was developed. Therefore, there would be no impact to resources under either development scenario.

Noise

The noise impacts associated with the Original Proposed Project would be less than significant with mitigation. Given that approximately 90 fewer residential lots would occur under this Alternative, long-term noise levels associated with occupancy and vehicular traffic would be less than the noise levels under the Original Proposed Project. This Alternative does not include new marina facilities, which in turn, would not produce new noise sources from watercraft utilizing Big Bear Lake. Additionally, construction-related noise from site development and realignment of SR-38 would not occur with this Alternative.

Population and Housing

Although the impacts to Population and Housing would be less than significant with the Original Proposed Project, the impacts would be even less with the No Project/Existing Designation Alternative.

Public Services

The public services impacts associated with the Original Proposed Project would be less than significant.

Fire and Police Protection. The No Project/Existing Designation Alternative would result in development of 1.5 residential lots on the project site; thus, a nominal increase in the demand for fire and police protection services would occur over existing conditions. Similar to the Original Proposed Project, this Alternative would not result in the need for expansion or construction of police or fire protection facilities. However, compared to the Original Proposed Project, the number of service calls would decrease with this Alternative.

Schools. The No Project/Existing Designation Alternative would generate approximately one school child (.21 students x 1.5 dwelling units). This is substantially fewer students that would be generated with the Original Proposed Project. Since the No Project/Existing Designation Alternative would generate fewer students, fewer impacts would be placed on existing educational resources.

Libraries. The No Project/Existing Designation Alternative would generate approximately three additional residents; however, as with the Original Proposed Project, the addition of new residents would not significantly impact libraries serving the project site.

Recreation

Impacts to recreation would be less than significant with the Original Proposed Project. Approximately three new residents would be added to the Fawnskin area with this Alternative. This nominal increase in population would not adversely affect park facilities in the area. Unlike the Original Proposed Project, this Alternative would not include the construction of the marina. This Alternative would retain existing on-site paths/trails. However, public access on the project site and to the lakefront would not be assured since the Project site is private property.

Traffic and Circulation

The traffic impacts associated with the Original Proposed Project would be less than significant with mitigation. This Alternative would greatly reduce project related trips. In addition, the No Project/Existing Designation Alternative does not propose realignment of SR-38. Therefore, the General Plan Circulation Element would not have to be amended. Similar to the Original Proposed Project, this Alternative would contribute to the existing intersection deficiency at Stanfield Cutoff and Big Bear Boulevard, but to an insignificant degree, since it would likely generate less than 10 trips per day. This Alternative would result in substantially fewer new trips on the local road system when compared to the Original Proposed Project.

Utilities

Water. The utility impacts associated with the Original Proposed Project would be significant and unavoidable for water services. Given that the No Project/Existing Designation Alternative would result in development of only 1.5 residential lots on the project site, and would place a reduced demand on water resources.

Sewer. The utility impacts associated with the Original Proposed Project would be less than significant for sewer services. Given that the No Project/Existing Designation Alternative would result in development of 1.5 residential lots on the project site, the need to extend sewer lines to the project site would be less of an impact than with the Original Proposed Project. Alternatively, the 1.5 units that could be built would likely use septic instead of a tying into the sewer system. This Alternative would require a reduced demand on sewer services.

Solid Waste. The utility impacts associated with the Original Proposed Project would be less than significant for solid waste services. The No Project/Existing Designation Alternative would produce less solid waste when compared to the Original Proposed Project. However, this Alternative, as with the Original Proposed Project, would not result in significant impacts to existing landfills. Nonetheless, 1.5 residents would generate substantially less solid waste.

Utilities. The utility impacts associated with the Original Proposed Project would be less than significant for other utility services, like natural gas and electricity services. The No Project/Existing Designation Alternative would result in a nominal increase in demand for utility services (i.e., gas, electric) beyond existing levels and at levels less than those of the Original Proposed Project. The need for modification and addition of utilities into the project site would be less than for the Original Proposed Project.

7.4.3 - Ability to Meet Project Objectives

The No Project/Existing Designation Alternative would substantially decrease the intensity of the environmental impacts associated development of the Original Proposed Project. By not realigning SR-38, the project site would maintain the majority of its existing visual character. The No Project/Existing Designation Alternative would substantially reduce all environmental impacts associated with the Original Proposed Project. However, this Alternative does not meet the objectives established for the Original Proposed Project, which are to provide a marina, realign SR-38 to allow lakefront homes and up to 92 single-family residential lots that would ultimately be developed with custom homes.

7.4.4 - Summary

Although the No Project/ Existing Designation Alternative would in no way fulfill the project objectives, it is considered to be an environmentally superior alternative because it would eliminate the significant unavoidable impacts associated with the Original Proposed Project.

7.5 - Reduced Density, Without Road Realignment and Without Marina Alternative

7.5.1 - Description of Alternative

For the Reduced Density, Without Road Realignment and Without Marina Alternative, development of 62 residential lots and associated infrastructure would occur on the north side of the existing

SR-38. SR-38 would not be realigned and no residential development would occur to the south of the highway. The land area south of SR-38, along the lakefront, would be retained in its current state. Approximately 143 persons (62 housing units x 2.31 persons/household) would be added to the population of the Community of Fawnskin.

7.5.2 - Evaluation of Impacts Compared to the Original Proposed Project

Aesthetics

The aesthetic impacts associated with the Original Proposed Project would be significant and unavoidable. As with the Original Proposed Project, the visual character of the site, which consists of undeveloped forest land, would be modified under the Reduced Density, Without Road Realignment and Without Marina Alternative. Given that this Alternative involves development to the north of SR-38 and no realignment of SR-38, fewer Aesthetic impacts are anticipated with respect to landform alteration, aesthetics, light and glare. Since this Alternative does not include development south of SR-38, views of Big Bear Lake from SR-38 would be retained. Although some existing views of the Lake and mountains to the south, from Flicker Road, may still be obstructed with this Alternative, surrounding uses to the east and west would retain views of the Lake and mountains. The scaled back nature of this Alternative would also reduce, but not eliminate the light and glare impacts.

Agricultural Resources

Impacts to agricultural resources would be less than significant with the Original Proposed Project, because no agricultural use of the site has previously occurred and the site is not designated as prime farmland. Therefore, the Reduced Density, With Project Redesign Alternative would similarly not affect agricultural resources.

Air Quality

The air quality impacts (short-and long-term) associated with the Original Proposed Project would be significant and unavoidable. Under the Reduced Density, Without Road Realignment and Without Marina Alternative, fewer residences would be generated. Therefore, less mobile (vehicular trips) and energy source emissions would be generated over the Original Proposed Project. In addition, with fewer homes, less particulate emissions would be generated. Overall, this Alternative would result in fewer local and regional air pollutant emissions. Additionally, construction-related emissions from the realignment of SR-38 would not occur with this Alternative.

Biological Resources

The Original Proposed Project would have significant and unavoidable impacts related to biological resources, specifically for bald eagle habitat. With this Alternative, the conversion of undeveloped forest land and impacts to biological resources north of SR-38 would be similar to those of the Original Proposed Project. However, this Alternative would not modify existing habitat to the south of SR-38. Therefore, no physical impacts to biological resources would occur south of SR-38.

Because less land disturbance would occur with this Alternative, compared to the Original Proposed Project, fewer trees would be removed.

Cultural Resources

Although with the Original Proposed Project the impacts to cultural resources would be less than significant with mitigation, there would be fewer impacts to cultural resources with the Reduced Density, Without Road Realignment and Without Marina Alternative because less land would be disturbed.

Geology and Soils

With implementation of mitigation measures, standard regulations and UBC, the impacts to geologic resources would be less than significant for the Original Proposed Project. Although the geologic impacts would be less than significant with the Original Proposed Project, there would be even fewer geological impacts with the Reduced Density, Without Road Realignment and Without Marina Alternative because less land would be disturbed. Under this Alternative, fewer residents and structures would be exposed to seismic hazards. This Alternative does not propose realignment of SR-38; therefore, the grading associated with the realignment would not occur. Additionally, the area south of SR-38 would not be developed, which further reduces that amount of required grading. Grading required for this Alternative would occur for development of approximately 62 residential lots north of SR-38. The grading associated with this Alternative would create similar potential impacts from slope stability as the Original Proposed Project, since both the Original Proposed Project and this Alternative would allow the development of homes on the steepest portions (northern half) of the site.

Hazards and Hazardous Materials

Although the hazards and hazardous materials impacts would be less than significant with the Original Proposed Project, there would be even fewer hazards and hazardous materials impacts with the Reduced Density, Without Road Realignment and Without Marina Alternative.

Hydrology (Drainage and Water Quality)

The impacts to hydrology would be significant for the Original Proposed Project. The Reduced Density, Without Road Realignment and Without Marina Alternative would involve less development within the project area and the amount of impermeable surface area (i.e., roads, driveways, etc) would be less than the Original Proposed Project. Additionally, this Alternative would involve fewer residences and vehicles on-site, thus reducing pollution sources of stormwater runoff.

Land Use and Relevant Planning

The land use impacts would be less than significant for the Original Proposed Project with adherence to the development standards established for the Low Density Residential (RS) land use designation. Currently, the project site is designated as RL-40. Like the Original Proposed Project, under the

Reduced Density, Without Road Realignment and Without Marina Alternative, development onsite would not be consistent with the RL-40 land use designation and a general plan amendment would be required. Development of the Reduced Density, Without Road Realignment and Without Marina Alternative would include 62 residential lots and associated infrastructure and would also be developed under the Single Residential (RS-7200) land use designation.

This Alternative would not include realignment of SR-38, thus no amendment to the Circulation Element of the General Plan would occur. Similar to the Original Proposed Project, development standards under this Alternative would be required to be consistent with the provisions of the Geologic Hazard, Fire Safety, Biotic Resources and Scenic Resources Overlay District provisions/requirements in the San Bernardino Development Code. Per the provisions of the Geologic Hazard, Fire Safety, and Biotic Resources Overlay Districts, either the Original Proposed Project or this Alternative would result in less than significant impacts, with compliance of the development standards outlined in the Development Code and mitigation measures referenced in the applicable technical reports (i.e., geology/soils and biological reports). This Alternative would not result in obstructed views of Big Bear Lake and distant mountain ranges from the lakefront and/or SR-38. Hence, this Alternative would be consistent with development standards set forth in the Scenic Resources Overlay District.

Mineral Resources

The site is not within an area designated by the State for locally important mineral resources and it does not lie within the County of San Bernardino's Mineral Resource Zone. No impacts to mineral resources would occur as a result of the project's implementation.

Noise

The noise impacts associated with the Original Proposed Project would be less than significant with mitigation. Given that approximately 30 fewer residential lots would occur under this Alternative, long-term noise levels associated with vehicular traffic would be less than the noise levels under the Original Proposed Project. Additionally, construction-related noise from the realignment of SR-38 would not occur with this Alternative.

Population and Housing

Although the impacts to Population and Housing would be less than significant with the Original Proposed Project, the impacts would be even less with the Reduced Density, Without Road Realignment and Without Marina Alternative.

Public Services

The public services impacts associated with the Original Proposed Project would be less than significant.

Fire and Police Protection. The Reduced Density, Without Road Realignment and Without Marina Alternative would result in development of 62 residential lots, as compared to 92 residential lots with the Original Proposed Project. Any development of the site would increase the demand for fire and police protection services over existing conditions. Similar to the Original Proposed Project, this Alternative would not result in the need for expansion or construction of police or fire protection facilities. However, compared to the Original Proposed Project, the number of service calls would be less with this Alternative.

Schools. The Reduced Density, Without Road Realignment and Without Marina Alternative would generate approximately 13 schoolchildren (.21 x 62 dwelling units). This is substantially fewer students than would be generated with the Original Proposed Project. Since this Alternative would generate fewer students, less impacts would be placed on existing educational resources.

Libraries. The Reduced Density, Without Road Realignment and Without Marina Alternative would generate approximately 133 residents; however, as with the Original Proposed Project, the addition of these new residents would not significantly impact libraries serving the project site.

Recreation

Although the recreation impacts to would be less than significant with the Original Proposed Project, there would be even less recreation impacts with the Reduced Density, Without Road Realignment and Without Marina Alternative. This Alternative does not include residential development along the lakefront, so the lakefront would remain in its existing condition. Public access on the site and to the lakefront would not be assured since the Project site is private property. Neither this Alternative, nor the Original Proposed Project would increase the use of existing parks or recreational facilities such that substantial physical deterioration would occur.

Traffic and Circulation

The traffic impacts associated with the Original Proposed Project would be less than significant with mitigation. The Reduced Density, Without Road Realignment and Without Marina Alternative does not include realignment of SR-38. Therefore, no amendment to the County's Circulation Element would be required. Because of the reduction in the number of residential lots, this Alternative would result in fewer new trips on the local road system when compared to the Original Proposed Project. However, both the Original Proposed Project and this Alternative would contribute to the existing intersection deficiency at Stanfield Cutoff and Big Bear Boulevard. Both the Original Proposed Project and this Alternative would be required to pay "fair-share" fees to mitigate respective contributions to the existing intersection deficiency.

Utilities

Water: The utility impacts associated with the Original Proposed Project would be significant and unavoidable for water services. Given that the Reduced Density, Without Road Realignment and

Without Marina Alternative would result in development of 62 residential lots on the project site, the need to increase water supply and storage facilities would be less of an impact than with the Original Proposed Project, but the impact would still be potentially significant. Because this Alternative proposes a reduction in the number of residential lots proposed, this Alternative would result in a reduced impact on existing water resources. In addition, because this Alternative includes a substantial reduction in the number of residential lots that would be developed, compared to the Original Proposed Project, the Reduced Density, Without Road Realignment and Without Marina Alternative would be considered environmentally superior.

Sewer. The utility impacts associated with the Original Proposed Project would be less than significant for sewer services. Given the substantial reduction in the number of residential lots that would be developed under this Alternative, this Alternative would place a reduced demand on sewer services.

Solid Waste. The utility impacts associated with the Original Proposed Project would be less than significant for solid waste services. The Reduced Density, Without Road Realignment and Without Marina Alternative would produce less solid waste when compared to the Original Proposed Project. However, this Alternative, as with the Original Proposed Project, would not create impacts to existing landfills.

Utilities. The utility impacts associated with the Original Proposed Project would be less than significant for other utility services, like natural gas and electricity services. The Reduced Density, Without Road Realignment and Without Marina Alternative would increase the demand for utility services (i.e., gas, electric) beyond existing levels, but at levels less than those of the Original Proposed Project. The need for modification and addition of utilities would be less than for the Original Proposed Project.

7.5.3 - Ability to Meet Project Objectives

The Reduced Density, Without Road Realignment and Without Marina Alternative would decrease the intensity of the environmental impacts associated with the proposed construction and operation of the Original Proposed Project. By not realigning SR-38, with this Alternative, the site would maintain the existing forested nature and visual character south of SR-38. Views of the Lake and mountain ranges would be retained from SR-38 and from uses to the east and west of the project site. This Alternative does not meet the primary objectives for the proposed Project, to provide a marina facility and realignment of North Shore Drive in order to improve the design of the roadway, which would also allow for lakefront lots to be developed. Therefore, this Alternative partially meets the project objectives, but falls short with only 62 residential lots, no realignment of SR-38 to create lakefront lots and no marina.

7.5.4 - Summary

The Reduced Density, Without Road Realignment and Without Marina Alternative would reduce but not eliminate all environmental impacts associated with the Original Proposed Project. However, because some impacts can be eliminated or substantially reduced under this alternative, it is considered to be environmentally superior to the Original Proposed Project.

7.6 - Reduced Density, Utilizing Proposed Project Redesign Alternative

7.6.1 - Description of Alternative

For the Reduced Density, utilizing the proposed Project Redesign Alternative, development of 66 residential lots and associated infrastructure would occur on the project site and SR-38 would be realigned. Under this Alternative, 45 lots would be developed north of the repositioned SR-38, and 21 lots would be developed on the south of the highway. This Alternative would include a marina facility, with 72 boat slips. Approximately 153 persons (66 housing units x 2.31 persons/household) would be added to the population of the Community of Fawnskin.

7.6.2 - Evaluation of Impacts Compared to the Proposed Project

Aesthetics

The aesthetic impacts associated with the Original Proposed Project would be significant and unavoidable. As with the Original Proposed Project, the visual character of the site, which consists of undeveloped forest land, would be modified under the Reduced Density, With Project Redesign Alternative. Given that this Alternative proposes development to the north and south of SR-38 and includes the realignment of SR-38, similar impacts are anticipated with respect to landform alteration, aesthetics and light and glare. Since this Alternative would involve decreased residential densities to the south of SR-38, views of Big Bear Lake and the distant mountain ranges from SR-38 would not be as obstructed when compared to the Original Proposed Project. Residential lot development associated with this Alternative, as well as the Original Proposed Project, would limit public access to the lakefront and change the visual character of the site. However, since the project site is privately owned, public access is not assured under existing conditions. As with the Original Proposed Project, this Alternative would alter the visual character of the lake with implementation of the marina facilities. Thus, similar to the Original Proposed Project, the Reduced Density, With Project Redesign Alternative would change the visual character of the project area and adversely impact views of the lake and the distant mountain ranges.

Agricultural Resources

Impacts to agricultural resources would be less than significant with the Original Proposed Project, because no agricultural use of the site has previously occurred and the site is not designated as prime farmland. Therefore, the Reduced Density, With Project Redesign Alternative would similarly not affect agricultural resources.

Air Quality

The air quality impacts (short-and long-term) associated with the Original Proposed Project would be significant and unavoidable. Because of the reduction in the number of residential lots that would be developed, fewer vehicular trips would be generated under this Alternative, which would produce less mobile and energy source emissions. Additionally, with fewer homes, less particulate emissions would be generated. This Alternative would result in fewer local and regional air pollutant emissions.

Biological Resources

The Original Proposed Project would have significant and unavoidable impacts related to biological resources, specifically for bald eagle habitat. The Reduced Density, With Project Redesign Alternative would impact existing on-site biological resources similar to the Original Proposed Project but to a lesser degree. Both the Original Proposed Project and this Alternative involves tree removal during individual lot development and construction of custom homes. Additionally, both the Original Proposed Project and this Alternative would remove approximately one-fourth of the existing 2,760 trees for realignment of SR-38. However, because fewer lots will be created that could impact bald eagle habitat, the Reduced Density, With Project Redesign Alterative is considered environmentally superior to the Original Proposed Project.

Cultural Resources

Although with the Original Proposed Project the impacts to cultural resources would be less than significant with mitigation, there would be fewer impacts to cultural resources with the Reduced Density, With Project Redesign Alternative because less land disturbance would occur. Therefore, the Reduced Density, With Project Redesign Alternative would be considered environmentally superior to the proposed Project.

Geology and Soils

With implementation of mitigation measures, standard regulations and UBC, the impacts to geologic resources would be less than significant for the Original Proposed Project. Under this Alternative, fewer residents and structures would be exposed to seismic hazards than would with the Original Proposed Project. Both this Alternative and the Original Proposed Project would involve grading for the realignment of SR-38 and for structures to the north and south (lakefront) of SR-38. Grading required for this Alternative would occur for development of approximately 66 residential lots to the north and south of SR-38. The amount of grading associated with this Alternative would create similar potential impacts from slope stability as the Original Proposed Project, since both would develop homes on the steepest portions (northern half) of the site.

Hazards and Hazardous Materials

Although the hazards and hazardous materials impacts would be less than significant with the Original Proposed Project, there would be even fewer hazards and hazardous materials impacts with the Reduced Density, With Project Redesign Alternative.

Hydrology (Drainage and Water Quality)

The impacts to hydrology would be significant for the Original Proposed Project. The Reduced Density, With Project Redesign Alternative would involve less development in the project area than the Original Proposed Project. The amount of impermeable surface area (i.e., residences, driveways, etc) would be reduced with this Alternative because fewer homes will cover the same amount of land. Additionally, this Alternative would involve fewer residences and vehicles onsite, which would reduce pollution sources of stormwater runoff.

Land Use and Relevant Planning

The land use impacts would be less than significant for the Original Proposed Project. As with the Original Proposed Project, this Alternative would require a general plan amendment. Currently, the project site is designated as RL-40. Under the Reduced Density, With Project Redesign Alternative, as well as the Original Proposed Project, development onsite would not be consistent with the RL-40 land use designation. Development of this Alternative would include 66 residential lots and associated infrastructure under the RS-7200 land use designation. This Alternative would include realignment of SR-38, thus an amendment to the Circulation Element of the General Plan would be required. Similar to the Original Proposed Project, development standards under this Alternative would be required to be consistent with the provisions of the Geologic Hazard, Fire Safety, Biotic Resources and Scenic Resources Overlay Districts in the San Bernardino Development Code. Per the provisions of the Geologic Hazard, Fire Safety, and Biotic Resources Overlay Districts, either Alternative would result in similar less than significant impacts with compliance of the development standards outlined in the Development Code and identified mitigation measures in the appropriate technical reports (i.e., geology/soils and biological reports). Similar to the Original Proposed Project, this Alternative would result in obstructed views of Big Bear Lake. Thus, this Alternative would not be consistent with the developments standards set forth in the Scenic Resources Overlay District. Therefore, impacts associated with this Alternative would be similar to those of the Original Proposed Project.

Mineral Resources

The site is not within an area designated by the State for locally important mineral resources and it does not lie within the County of San Bernardino's Mineral Resource Zone. No impacts to mineral resources would occur as a result of the project's implementation.

Noise

The noise impacts associated with the Original Proposed Project would be less than significant with mitigation. Given that 26 fewer residential lots would occur under this Alternative, long-term noise levels associated with vehicular traffic would be reduces with this Alternative. Additionally, this Alternative would include a 72-boat slip marina facility, compared to a 100-boat slip marina with the Original Proposed Project, which in turn, would produce less new noise sources from watercraft utilizing Big Bear Lake.

Population and Housing

Although the impacts to Population and Housing would be less than significant with the Original Proposed Project, there would be even fewer impacts to Population and Housing with the Reduced Density, With Project Redesign Alternative.

Public Services

The public services impacts associated with the Original Proposed Project would be less than significant.

Fire and Police Protection. The Reduced Density, With Project Redesign Alternative would result in development of 66 residential lots, as compared to 92 residential lots within the Original Proposed Project. Any development of the site would result in a nominal increase in the demand for fire and police protection services over existing conditions. Similar to the Original Proposed Project, this Alternative would not result in the need for expansion or construction of police or fire protection facilities. However, compared to the Original Proposed Project, the number of service calls would decrease with this Alternative.

Schools. The Reduced Density, with Project Redesign Alternative would generate approximately 14 schoolchildren (.21 x 66 dwelling units). This is substantially fewer students than would be generated with the Original Proposed Project. Since this Alternative would generate fewer students, less impacts would be placed on existing educational resources.

Libraries. The Reduced Density, With Project Redesign Alternative would generate approximately 153 residents; however, as with the Original Proposed Project, the addition of these new residents would not significantly impact libraries serving the project site.

Recreation

Impacts to recreation would be less than significant with the Original Proposed Project. Similar to the Original Proposed Project, this Alternative would include residential development along the lakefront. The shoreline/lakefront would be developed with residential uses (21 dwelling units) and would include marina facilities which would be located south of SR-38. However, public access on the site and to the lakefront would not be assured since the Project site is a private property. This Alternative would include a 72-boat slip marina facility. Neither this Alternative nor the Original Proposed Project would increase the use of existing parks or recreational facilities such that substantial physical deterioration would occur.

Traffic and Circulation

The traffic impacts associated with the Original Proposed Project would be less than significant with mitigation. This Alternative also includes realignment of SR-38. As compared to the Original Proposed Project, the Reduced Density, With Project Redesign Alternative would generate less project-related traffic. This Alternative would result in fewer new trips on the local road system when

compared to the Original Proposed Project. However, both the Original Proposed Project and this Alternative would contribute to the existing intersection deficiency at Stanfield Cutoff and Big Bear Boulevard. The Original Proposed Project and this Alternative would be required to pay "fair-share" fees to mitigate their respective contribution to the existing intersection deficiency.

Utilities

Water. The utility impacts associated with the Original Proposed Project would be significant and unavoidable for water services. Given that the Reduced Density, With Project Redesign Alternative would result in development of 66 residential lots on the project site, the need to increase water supply and storage facilities would be less of an impact than with the Original Proposed Project. Because this Alternative proposes a reduction in the number of residential lots that would be developed, this Alternative would result in a reduced impact on water resources.

Sewer. The utility impacts associated with the Original Proposed Project would be less than significant for sewer services. Given the reduction in the number of residential lots that could be developed with this Alternative, this Alternative would place a reduced demand on sewer services over the Original Proposed Project.

Solid Waste. The utility impacts associated with the Original Proposed Project would be less than significant for solid waste services. The Reduced Density, With Project Redesign Alternative would produce less solid waste when compared to the Original Proposed Project.

Utilities. The utility impacts associated with the Original Proposed Project would be less than significant for other utility services, like natural gas and electricity services. The Reduced Density, With Project Redesign Alternative would increase the demand for utility services (i.e., gas, electric) beyond existing levels but, at levels less than those of the Original Proposed Project, but the impact would still be potentially significant. Given the density of this Alternative, the need for modification and addition of utilities would be less than for the Original Proposed Project.

7.6.3 - Ability to Meet Project Objectives

The Reduced Density, With Project Redesign Alternative would decrease the intensity of the environmental impacts associated with the construction and development of the Original Proposed Project. This Alternative would involve decreased residential densities to the south of SR-38, views of Big Bear Lake and the distant mountain ranges from SR-38 would be less obstructed, when compared to the Original Proposed Project. The Reduced Density, With Project Redesign Alternative would reduce but not eliminate all environmental impacts associated with the Original Proposed Project. However, this Alternative does not meet the primary objectives for the Original Proposed Project, which proposes 92 single-family residential custom lots. Therefore, this Alternative partially meets the project objectives, but falls short with only 66 residential lots.

7.6.4 - Summary

The Reduced Density, With Project Redesign Alternative would reduce but not eliminate some environmental impacts associated with the Original Proposed Project. Other impacts such as those related to aesthetics, biological resources would be similar because although the number of residential lots would be reduced by 26, the development of the site would be similar. So although some impacts can be eliminated or substantially reduced under this Alternative, it is not considered an environmentally superior alternative.

7.7 - Proposed Project Alternative

7.7.1 - Description of Alternative

The Proposed Project Alternative is the subdivision of the site into 57 lots, 50 numbered lots (residential lots) to be sold individually and developed into custom homes and 7 lettered lots, one would be designated as Open Space/Conservation easement; one would be designated as Open Space/Conservation and Neighbor Lake Access easement; three are the well sites; one would be potentially developed for an on-site reservoir, and one would be developed as the marina parking lot with a boat ramp. The Marina lot also includes some open space for the preservation of existing trees; however, because of the development of the parking lot and boat ramp, the lot would not be considered Open Space. Exhibit 2-4, Original Proposed Project, and Exhibit 2-5, Proposed Project Alternative, in Section 2, Project Description, show the following differences between the plans:

- The Tentative Tract Map has been revised to reduce the number of lots from 95 lots to 57 lots by: 1) proposing larger lot sizes (minimum 20,000-square-foot lots – BV/RS-20M); 2) eliminating all residential development along the shoreline; and 3) creating two distinct conservation areas – one covering a portion of the shoreline south of SR-38 (this lot includes Neighborhood Lake Access), and the other encompassing the pebble plain habitat and bald eagle perches on the west end of the site. A third lettered lot consists of the parking lot/boat launch ramp, which also includes some open space, but because of the proposed use, cannot be referred to as Open Space/Conservation. Finally, there are three lettered lots for the existing water well sites and one lettered lot for the potential reservoir site. In addition, a 10-acre offsite pebble plain habitat would be purchased and dedicated as an off-site Conservation Easement.

- The request for a General Plan Amendment has been revised to reflect the larger minimum lot size and to re-designate the site from BV/RL-40 (minimum lot size 40 acres) to BV/RS-20M (minimum lots size 20,000 square feet) instead of the Original Proposed Project's BV/RS (minimum lot size 7,200 square feet).

- The proposed marina has been moved from the lake shore near the west side of the site to the east side of the site, and the size of the marina has been reduced from 103 slips to 55 slips, to

reflect the proposed reduction in the number of residential lots to be developed. For the proposed marina parking lot, direct access from SR-38 is required, whereas under the Original Proposed Project, access to the marina parking lot was from private street A.

- The realignment of a segment of SR-38 has been deleted from the Proposed Alternative Project and no changes in the SR-38 configuration are now proposed. Because the road segment would not be realigned, the proposed removal of approximately 665 trees of the 2,760 trees identified on site would not occur. The incidence of tree removal to develop lots would also be reduced because larger lot sizes would allow homebuilders greater options in siting the homes to avoid trees. No direct access to SR-38 from individual lots is proposed. Access to individual lots would be from the proposed public streets (A and B). Also, with the deletion of all lakefront residential lots south of SR-38, the need for five points of ingress/egress from the south side has been reduced to two for the marina parking lot (refer to Exhibits 2-4 and 2-5), to allow traffic through the marina parking lot to flow. Residents' access from the project site north of SR-38 has been reduced from three streets to two, with the third street shown on the original site plan now proposed to be used for emergency access only.

7.7.2 - Evaluation of Impacts Compared to the Proposed Project

Aesthetics

The aesthetic impacts associated with the Original Proposed Project would be significant and unavoidable. As with the Original Proposed Project, the existing visual character of the site would be modified under the Proposed Project Alternative. However, the level of aesthetic impacts would be reduced with this Alternative. With this Alternative, no residential use is proposed south of SR-38 and the highway would not be realigned. Therefore, views of Big Bear Lake and the distant mountain ranges from SR-38 would not be obstructed with structures. In addition, 5.73 acres would be preserved for open space/conservation/Neighborhood Lake Access, and would therefore, be aesthetically superior and more inline with the existing conditions than would the Originally Proposed Project. Since this Alternative proposes no residential development along the lakeshore and less dense residential use (50 lots, with minimum 20,000-square-foot lots), fewer light and glare impacts would occur, and the area would retain its mountain community ambiance. Therefore, the Proposed Project Alternative would be considered environmentally superior to the Original Proposed Project.

Agricultural Resources

Impacts to agricultural resources would be less than significant with the Original Proposed Project, because no agricultural use of the site has previously occurred and the site is not designated as prime farmland. Therefore, the Proposed Project Alternative would similarly not affect agricultural resources.

Air Quality

The air quality impacts (short-and long-term) associated with the Original Proposed Project would be significant and unavoidable. Because of the reduction in proposed number of residential lots that could be developed, fewer vehicular trips would be generated under this Alternative, which would produce less mobile and energy source emissions. Additionally, with fewer homes, less particulate emissions would be generated. This Alternative would result in fewer local and regional air pollutant emissions. Therefore, the Proposed Project Alternative would be considered environmentally superior to the Original Proposed Project.

Biological Resources

The Original Proposed Project would have significant and unavoidable impacts related to biological resources, specifically for bald eagle habitat. The Proposed Project Alternative would preserve 5.73 acres of open space/conservation, which would preserve habitat for the bald eagle and pebble plain, and would acquire a 10-acre off-site Conservation Easement for Pebble Plain habitat preservation. In addition, fewer lots would be developed for residential use, and SR-38 would not be realigned from its current location, which would also reduce impacts to bald eagle habitat. However, tree removal and mitigation would still be required and some loss of habitat would occur, but not to the same degree as the Original Proposed Project.

Cultural Resources

Although with the Original Proposed Project, the impacts to cultural resources would be less than significant with mitigation, there would be fewer impacts to cultural resources with the Proposed Alternative Project because less land disturbance would occur. Therefore, the Proposed Project Alternative would be considered environmentally superior to the Original Proposed Project.

Geology and Soils

With implementation of mitigation measures, standard regulations and UBC, the impacts to geologic resources would be less than significant for the Original Proposed Project. Compared to the Original Proposed Project, under this Alternative, fewer residents and structures would be exposed to seismic hazards. This Alternative would not involve grading for the realignment of SR-38. The amount of grading associated with this Alternative would create similar potential impacts from slope stability as the Original Proposed Project, since both would develop homes on the steepest portions (northern half) of the site. However, because this alternative includes 42 fewer homes, and larger lot sizes, with 12 lots over 1 acre in size, this Alternative represents an opportunity to reduce the amount of grading that would be required to develop lots by being able to avoid steeper portions of lots and still develop building pads. Thus, less land disturbance and less potential to develop on steep slopes would occur.

Hazards and Hazardous Materials

Although the hazards and hazardous materials impacts would be less than significant with the Original Proposed Project, there would be even fewer hazards and hazardous materials impacts with the Proposed Project Alternative.

Hydrology (Drainage and Water Quality)

The impacts to hydrology would be significant for the Original Proposed Project due to the water supply issues. The Proposed Project Alternative would involve less development in the project area over the Original Proposed Project. The amount of impermeable surface area (i.e., residences, driveways, etc) would be reduced with this Alternative because substantially fewer homes would cover the same gross amount of land. Additionally, this Alternative would involve fewer residences and vehicles on-site, thus reducing pollution sources of stormwater runoff.

Land Use and Relevant Planning

The land use impacts would be less than significant for the Original Proposed Project. As with the Original Proposed Project, this Alternative would require an amendment to the Official Land Use District designation of the project site, per the County of San Bernardino General Plan. Currently, the project site is designated as RL-40, yet the Proposed Project Alternative includes 50 residential lots with minimum 20,000 square feet (BV/RS-20M). This Alternative would not include realignment of SR-38, thus an amendment to the Circulation Element of the General Plan would not be required. Similar to the Original Proposed Project, development standards under this Alternative would be required to be consistent with the provisions of the Geologic Hazard, Fire Safety, Biotic Resources and Scenic Resources Overlay Districts in the San Bernardino Development Code. Per the provisions of the Geologic Hazard, Fire Safety, and Biotic Resources Overlay Districts, both the Original Project and the Proposed Alternative Project will result in less than significant impacts with compliance of the development standards outlined in the Development Code and identified mitigation measures in the appropriate technical reports (i.e., geology/soils and biological reports).

Contrary to the Original Proposed Project, this Alternative would not result in obstructed views of Big Bear Lake and the distant mountain ranges from the portion of the lakefront and/or SR-38 that traverses the project site. Thus, this Alternative would be consistent with the developments standards set forth in the Scenic Resources Overlay District.

Mineral Resources

The site is not within an area designated by the State for locally important mineral resources and it does not lie within the County of San Bernardino's Mineral Resource Zone. No impacts to mineral resources would occur as a result of the Proposed Alternative Project's implementation.

Noise

The noise impacts associated with the Original Proposed Project would be less than significant with mitigation. Given that 42 fewer residential lots would occur under this Alternative, long-term noise levels associated with vehicular traffic would be reduced with this Alternative. Additionally, this Alternative would include a 55-boat slip marina facility, compared to a 103-boat slip marina with the Original Proposed Project, which in turn, would produce less new noise sources from watercraft utilizing Big Bear Lake.

Population and Housing

Although the impacts to Population and Housing would be less than significant with the Original Proposed Project, the impacts would be even less with the Proposed Project Alternative.

Public Services

The public services impacts associated with the Original Proposed Project would be less than significant.

Fire and Police Protection. This Alternative would result in development of 50 residential lots, as compared to 92 residential lots within the Original Proposed Project. Development under this Alternative or the Original Proposed Project would result in a nominal increase in the demand for fire and police protection services over existing conditions. Similar to the Original Proposed Project, this Alternative would not result in the need for expansion or construction of police or fire protection facilities. However, compared to the Original Proposed Project, the number of service calls would decrease with this Alternative.

Schools. The Proposed Project Alternative would generate approximately 11 schoolchildren (.21 x 50 dwelling units), which is eight fewer schoolchildren than the Original Proposed Project.

Libraries. The Proposed Project Alternative would generate approximately 116 new residents. However, as with the Original Proposed Project, the addition of these new residents would not significantly impact libraries serving the project site.

Recreation

Impacts to recreation would be less than significant with the Original Proposed Project. This Alternative includes 55 marina boat slips and 5.73 acres of open space/conservation/Neighborhood Lake Access, but because development would occur on the site, there would be a loss of trails and access to the forested areas to the north from the project site. However, since the trails on-site are unauthorized and not part of a public trail system, they are not guaranteed under existing conditions and access could be precluded at any time. Neither this Alternative, nor the Original Proposed Project would increase the use of existing parks or recreational facilities such that substantial physical deterioration would occur.

Traffic and Circulation

The traffic impacts associated with the Original Proposed Project would be less than significant with mitigation. Because this Alternative proposes substantially fewer residential lots, the Proposed Project Alternative would generate less project-related traffic. However, both the Original Proposed Project and this Alternative would contribute to the existing intersection deficiency at Stanfield Cutoff and Big Bear Boulevard, and either project would be required to pay "fair-share" fees to mitigate their respective contribution to the existing intersection deficiency.

Utilities

Water: The utility impacts associated with the Original Proposed Project would be significant and unavoidable for water services. In order to match the number of lots developed to the available onsite water supply, this Alternative proposes 50 residential lots. A Water Feasibility Study and Water Supply Report prepared specifically for this Alternative has shown that two of the three wells on-site can provide an adequate water supply for the proposed 50 residential lots. The wells will be deeded to County Service Area 53C or the Department of Water and Power (DWP) upon recordation of the final tract map. Therefore, under this Alternative, the Proposed Project Alternative has a secure water source. Coupled with the fact that this Alternative proposes substantially fewer residents, the Proposed Project Alternative is considered environmentally superior to the Original Proposed Project.

Sewer. The utility impacts associated with the Original Proposed Project would be less than significant for sewer services. Given the substantial reduction in the number of residential lots that could be developed with this Alternative, this Alternative would require a reduced demand on sewer services.

Solid Waste. The utility impacts associated with the Original Proposed Project would be less than significant for solid waste services. The Proposed Project Alternative would produce less solid waste when compared to the Original Proposed Project. This Alternative, as with the Original Proposed Project, would not create impacts to existing landfills. However, because this Alternative would generate substantially fewer residents, it would be considered environmentally superior to the Original Proposed Project.

Utilities. The utility impacts associated with the Original Proposed Project would be less than significant for other utility services, like natural gas and electricity services. The Proposed Project Alternative would increase the demand for utility services (i.e., gas, electric) beyond existing levels, but at levels less than those of the Original Proposed Project. Given the density of this Alternative, the need for modification and addition of utilities would be less than for the Original Proposed Project.

7.7.3 - Ability to Meet Project Objectives

Although the Proposed Project Alternative would result in reduced impacts to each environmental impact issue and is environmentally superior compared to the Original Proposed Project, this Alternative does not fully meet the objectives established for the Original Proposed Project. The Proposed Project Alternative includes only 50 residential lots instead of 92; it proposes only 55 marina boat slips, and it would not realign SR-38 and create lakefront lots. However, it will meet the objective of establishing a single-family residential subdivision on the project site that would be developed with custom homes and will also provide a marina for homeowner use as originally planned.

7.7.4 - Summary

The Proposed Project Alternative would significantly reduce, but not eliminate, the environmental impacts associated with the construction and operation of the Original Proposed Project. Because this Alternative proposes a 46 percent reduction in residential density, with no lakefront residential development south of SR-38, and no realignment of SR-38, views of Big Bear Lake and the distant mountain ranges from SR-38 would not be obstructed when compared to the proposed 92-lot Project. In addition, fewer biological impacts would occur because less land would be disturbed and because 5.73 acres of the site would be reserved for open space/conservation; in addition, 10 acres of offsite Pebble Plain habitat would be preserved through a Conservation Easement. The water feasibility study prepared for this Alternative has concluded that on-site wells can adequately provide water for the 50 residential lots proposed in this Alternative. The Proposed Project Alternative is environmentally superior to the Original Proposed Project and meets most of the primary project objectives, but not to the same degree as the Original Proposed Project.

7.8 - Comparison of Alternatives

Table 7-2 summarizes and compares the project characteristics and anticipated impacts of the alternatives compared to those of the Original Proposed Project. The Original Proposed Project has significant and unavoidable impacts to aesthetics, air quality, both short- and long-term, and biological resources, primarily for the impacts to bald eagle habitat, and utilities (water supply).

7.9 - Environmentally Superior Alternative

Based on the analysis of each alternative, the No Project – No Development alternative is the most environmentally superior alternative because it eliminates all of the significant impacts of the proposed project. However, CEQA Guidelines Section 15126.6 (e)(2) states the following:

> *If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.*

As shown in Table 7-1, project related impacts could be substantially reduced, by not realigning SR-38. Furthermore, the impacts could also be reduced by decreasing the overall density and reducing the number of residential lots. The Applicant has amended the Tentative Tract Map (TTM) to the standards of the Proposed Project Alternative. While several of the alternatives are environmentally superior to the Original Proposed Project, the Proposed Project Alternative evaluated in detail in this Revised Draft EIR is the preferred alternative and the environmentally superior alternative for the following reasons:

- The Proposed Project Alternative has the fewest number of residential lots, and the largest minimum lot size, with 12 of the lots over 1 acre in size;
- The Proposed Project Alternative includes 5.73 acres for conservation/open space and 10 acres of offsite Pebble Plain habitat would be preserved through a Conservation Easement. In addition, an area with the easternmost drainage that will be set aside for southern rubber boa habitat;
- The Proposed Project Alternative lessens the impacts of each impact area, and reduces significant impacts to Aesthetics Air Quality, and Water Supply to less than significant levels; and
- The Proposed Project Alternative would reduce the impacts to the greatest extent practicable, while maintaining a sound and fiscally feasible project.

Therefore, the Proposed Project Alternative is the Environmentally Superior alternative.

Table 7-2: Comparison of Alternatives

Issue	Original Proposed Project	No Project/No Development	No Project/ Existing Designation	Reduced Density, Without Road Realignment, Without Marina	Reduced Density, With Project Redesign	Proposed Project Alternative
Project Description	92 residential lots, 103-slip marina, realignment of SR-38, lake side properties, GP amendment required.	No development, site remains as is, no GP amendment required.	40-acre minimum lots, 1.5 lots could be developed, no marina, no GP amendment required.	62 residential lots, no marina, no SR-38 realignment, no development south of SR-38, GP amendment required.	66 residential lots, 72-slip marina, realignment of SR-38, residential development south of SR-38, GP amendment required.	50 residential lots, 55-slip marina, 5.73 acres of open space, no road realignment, no lake side properties, GP amendment required.
Aesthetics	**Significant**	No Impacts	Less Than Significant	**Potentially Significant**	**Significant, but not to the same degree as the Original Proposed Project**	Less Than Significant
Air Quality	**Significant**	No Impacts	Less Than Significant	**Significant, but not to the same degree as the Original Proposed Project**	**Significant, but not to the same degree as the Original Proposed Project**	Less Than Significant
Agriculture	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Biology	**Significant**	No Impacts	Less Than Significant	**Significant, but not to the same degree as the Original Proposed Project**	**Significant, but not to the same degree as the Original Proposed Project**	**Significant, but not to the same degree as the Original Proposed Project**
Cultural Resources	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Geology	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Hazards	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Hydrology [1]	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Land Use	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant

Table 7-2 (cont.): Comparison of Alternatives

Issue	Original Proposed Project	No Project/No Development	No Project/ Existing Designation	Reduced Density, Without Road Realignment, Without Marina	Reduced Density, With Project Redesign	Proposed Project Alternative
Mineral Resources	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Noise	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Pop and Housing	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Public Services	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Recreation	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Traffic	Less Than Significant	No Impacts	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant
Utilities	**Significant (water supply)**	No Impacts	Less Than Significant	**Potentially Significant**	**Potentially Significant**	Less Than Significant
Achieves Project Objectives?	Yes, completely	No	No	Housing: Yes, but not to the same degree. No lakefront lots. Marina: No.	Housing: Yes, but not to the same degree. Yes, lakefront lots. Marina: Yes, but not to the same degree.	Housing: Yes, but not to the same degree. No lakefront lots. Marina: Yes, but not to the same degree.
Feasible?	Yes	Yes	Yes	Yes	Yes	Yes

[1] Hydrology refers to drainage and water quality. Water supply is addressed under Utilities heading.
Note: "Less Than Significant" may or may not include mitigation. See detailed analysis for clarification.

SECTION 8: REPORT PREPARATION RESOURCES

8.1 - EIR Preparation Personnel

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Draft
Revised and Recirculated
Environmental Impact Report
Moon Camp 50-Lot Residential Subdivision, TT No. 16136
(Based on the Revised Site Plan)
Big Bear Lake, San Bernardino County, CA
SCH # 2002021105

APPENDICES

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Appendix A:
Air Quality Assessment

Air Quality Analysis Report
Moon Camp Tentative Tract
Community of Fawnskin
San Bernardino County, California

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July 6, 2007
Revised October, 2008 for Climate Change

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SECTION 1: INTRODUCTION

1.1 - Purpose and Methods of Analysis

The following air quality analysis was prepared to evaluate whether the expected criteria air pollutant emissions generated from the proposed project would cause significant impacts to air resources in the project area. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000 et seq.). The methodology follows the CEQA Air Quality Handbook prepared by the South Coast Air Quality Management District (SCAQMD) for quantification of emissions and evaluation of potential impacts to air resources. As recommended by SCAQMD staff, URBEMIS 2002 version 8.7.0, developed and approved by the California Air Resources Control Board (CARB), was used to quantify some project-related emissions.

1.2 - Executive Summary

1.2.1 - Site Location

The Moon Camp Tentative Tract Project (Project) site is located adjacent to the northwest shore of Big Bear Lake, in the relatively undeveloped eastern portion of Fawnskin. More specifically, the site is located in the northern half of Section 13, Township 2 North, Range 1 West, San Bernardino Base and Meridian. The Project site is generally situated between Flicker Road to the north, Big Bear Lake to the south, Polique Canyon Road to the east, and Oriole Lane/Canyon Road to the west.

1.2.2 - Development Description

The Project is a proposed subdivision consisting of 50 residential lots and 3 lettered lots for open space and common area, on approximately 62.43 acres. Proposed lot sizes range from one-half acre to over two acres, and the subdivision will be developed for custom lot sales.

1.2.3 - Findings

The study found that with mitigation measures all emissions are below the applicable SCAQMD thresholds during construction and operation of the proposed project. The analysis supports the following findings:

- The project is in compliance with the SCAQMD Air Quality Management Plan (AQMP);
- The project-generated emissions will not contribute to a violation of Federal and/or State ambient air quality standards;
- The project's contribution to cumulative impacts is not significant;
- The project will not expose sensitive receptors to substantial pollutant concentrations; and
- Project-generated odors will not affect a substantial number of people.

1.2.4 - Mitigation Measures

The following mitigation measures are considered feasible, practical, and effective and would be implemented to reduce emissions from the proposed project:

AQ – 1 Fugitive Dust Control Plan

Prior to construction, the project proponent will provide a Fugitive Dust Control Plan that will describe the application of standard best management practices to control dust during construction. The Fugitive Dust Control Plan shall be submitted to the County and SCAQMD for approval and approved prior to construction. Best management practices will include, but not limited to:

- For any earth moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
- For all disturbed surface areas (except completed grading areas), apply dust suppression in a sufficient quantity and frequency to maintain a stabilized surface; any areas which cannot be stabilized, as evidenced by wind driven dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
- For all inactive disturbed surface areas, apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind-driven fugitive dust, excluding any areas that are inaccessible due to excessive slope or other safety conditions.
- For all unpaved roads, water all roads used for any vehicular traffic once daily and restrict vehicle speed to 15 mph.
- For all open storage piles, apply water to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust.

AQ – 2 Emission Reductions from Construction Equipment

To reduce emissions from the construction equipment within the project site, the construction contractor will:

- To the extent that equipment and technology is available and cost effective, the contractor shall use catalyst and filtration technologies.
- All diesel-fueled engines used in construction of the project shall use ultra-low sulfur diesel fuel containing no more than 15-ppm sulfur, or a suitable alternative fuel.
- All construction diesel engine, which have a rating of 50 hp or more, shall meet the Tier II California Emission Standards for off-road compression-ignition engines, unless certified by the contractor that such engine is not available for a particular use. In the event that a Tier II engine is not available, Tier I compliant or 1996 or newer engines will be used preferentially. Older engines will only be used if the contractor certifies that compliance is not feasible.
- Heavy duty diesel equipment will be maintained in optimum running condition.

AQ – 3 Reduce Woodburing Emissions

To reduce the emissions from woodburning apparatus; the following requirement will be placed on all new residences constructed on the proposed project's lots:

- No open-hearth fireplace will be allowed in new construction, only Environmental Protection Agency (EPA) Phase II Certified fireplaces and wood stoves, pellet stoves, and natural gas fireplaces shall be allowed.

AQ – 4 Good Neighbor Policy for Burning

To establish a "Good Neighbor Policy for Burning" that will further help reduce the potential for localized nuisance complaints related to woodburning; the proponent shall distribute an informational flyer to each purchaser of lots. At a minimum, the flyer will say:

- Know When To Burn
  - Monitor all fires; never leave a fire unattended.
  - Upgrade an older woodstove to one with a catalytic combustor that burns off excess pollutants.
  - Be courteous when visitors come to your home. Wood smoke can cause problems for people with developing or sensitive lungs (i.e. children, the elderly) and people with lung disease.
- Know What To Burn
  - Split large pieces of wood into smaller pieces and make sure it has been seasoned (allowed to dry for a year). Burning fresh cut logs = smoky fires.
  - When buying wood from a dealer, do not assume it has been seasoned.
  - Small hot fires are more efficient and less wasteful than large fires.
  - Never burn chemically treated wood or non-wood materials.
  - Manufactured firelogs provide a nice ambience, have the least impact to air quality, and are a good choice for homeowners who use a fireplace infrequently.
- Know How To Burn
  - Proper combustion is key. Make sure your wood fire is not starved; if excess smoke is coming from the chimney or stack, the fire isn't getting enough air.
  - Visually check your chimney or stack 10 to 15 minutes after you light a fire to ensure it is not emitting excess amounts of smoke.
  - Homeowners should have woodstoves and fireplaces serviced and cleaned yearly to ensure they are working properly.

1.3 - Project Description and Location

The proposed Moon Camp Tentative Tract #16136 Residential Subdivision ("Moon Camp") encompasses approximately 62.43 currently vacant acres along the northwest shore of Big Bear Lake, in the community of Fawnskin, County of San Bernardino (refer to Exhibit 1, *Regional Vicinity*).

The Project site is located adjacent to the northwest shore of Big Bear Lake, in the relatively undeveloped eastern portion of Fawnskin (refer to Exhibit 2, *Local Vicinity*). More specifically, the site is located in the northern half of Section 13, Township 2 North, Range 1 West, San Bernardino Base and Meridian. The Project site is generally situated between Flicker Road to the north, Big Bear Lake to the south, Polique Canyon Road to the east, and Oriole Lane/Canyon Road to the west. Regional access to the site is provided via State Route 38, which currently bisects the property.

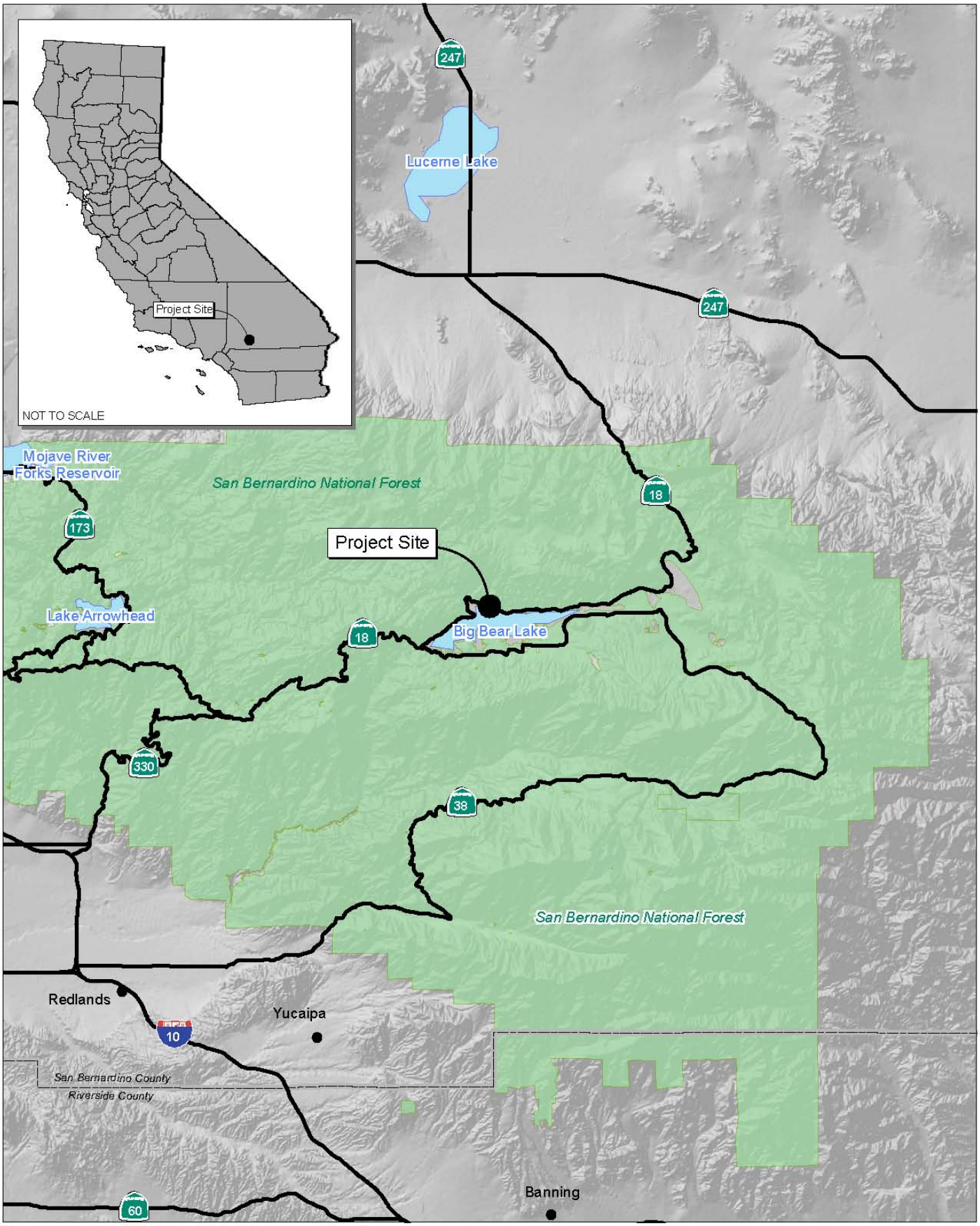
The Project is a proposed subdivision consisting of fifty (50) residential lots and three (3) lettered lots for open space and common area, on approximately 62.43 acres. Proposed lot sizes range from one-half acre to over two acres, and the subdivision will be developed for custom lot sales. Overall density of the project is 0.90 dwelling units per acre. Even though for this Project-specific grading will be limited to the construction of the interior streets and infrastructure and no grading of individual lots is proposed, for the purposes of determining the reasonably foreseeable impacts associated with full construction, this Report assumes the construction of the homes.

1.4 - Sensitive Receptors

Those who are sensitive to air pollution include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. For purposes of CEQA, the SCAQMD considers a sensitive receptor to be a location where a sensitive individual could remain for 24 hours, such as residences, hospitals, or convalescent facilities. Commercial and industrial facilities are not included in the definition because employees do not typically remain onsite for 24 hours. However, when assessing the impact of pollutants with 1-hour or 8-hour standards (such as nitrogen dioxide and carbon monoxide), commercial and/or industrial facilities would be considered sensitive receptors for those purposes.

Existing sensitive receptors within the vicinity of the project site include residential uses to the east along Highway 38, to the west along Canyon Road and to the north along Flicker Road. Other sensitive receptors include the following:

- Schools
    - 2.5 miles east – North Shore Elementary School (765 N. Stanfield Cutoff)
    - 2 miles southeast – Big Bear Middle School (41275 Big Bear Boulevard)
- Hospitals
    - 2.4 miles east southeast – Big Bear Valley Community Hospital (41870 Garstin Road)



Source: Census 2000 Data, The CaSIL, MBA GIS 2007.

NORTH

5 2.5 0 5 Miles

Michael Brandman Associates

Exhibit 1-1
Regional Location Map

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SAN BERNARDINO COUNTY
MOON CAMP 50-LOT RESIDENTIAL SUBDIVISION

Source: National Agriculutre Imagery Program, San Bernardino County (2005).

NORTH

2,000 1,000 0 2,000

Feet

Michael Brandman Associates

Exhibit 1-2
Project Vicinity Map - Aerial Base

SECTION 2: SETTING

2.1 - Regulatory Setting

Air pollutants are regulated at the national, state, and air basin level; each agency has a different degree of control. The United States Environmental Protection Agency (EPA) regulates at the national level. CARB regulates at the state level and the SCAQMD regulates at the air basin level.

2.1.1 - Federal and State Regulatory Agencies

EPA handles global, international, national, and interstate air pollution issues and policies. EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans (SIP), provides research and guidance in air pollution programs, and sets National Ambient Air Quality Standards (NAAQS), also known as federal standards. There are NAAQS for six common air pollutants, called criteria air pollutants, which were identified resulting from provisions of the Clean Air Act of 1970. The six criteria pollutants are:

- Ozone
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Nitrogen dioxide
- Carbon monoxide (CO)
- Lead
- Sulfur dioxide

The NAAQS were set to protect the health of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

CARB has overall responsibility for statewide air quality maintenance and air pollution prevention. The SIP for the State of California is administered by CARB. A SIP is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain NAAQS. CARB also administers California ambient air quality standards, or state standards, for the ten air pollutants designated in the California Clean Air Act (CCAA). All of the national criteria pollutants are also regulated by the state but California adds 4 pollutants. The additional state air pollutants are:

- Visibility reducing particulates
- Hydrogen sulfide
- Sulfates
- Vinyl chloride

The national and state ambient air quality standards and the most relevant effects are summarized in Table 1.

Table 1: Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard	Most Relevant Effects
Ozone	1 Hour	0.09 ppm	—	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage
	8 Hour	0.070 ppm	0.075 ppm	
Carbon Monoxide (CO)	1 Hour	20 ppm	35 ppm	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
	8 Hour	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm	—	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
	Mean	0.030 ppm	0.053 ppm	
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm	—	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
	24 Hour	0.04 ppm	0.14 ppm	
	Mean	—	0.030 ppm	
Particulate Matter (PM_{10})	24 hour	50 µg/m^3	150 µg/m^3	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in the elderly
	Mean	20 µg/m^3	—	
Particulate Matter ($PM_{2.5}$)	24 Hour	—	35 µg/m^3	
	Mean	12 µg/m^3	15.0 µg/m^3	
Sulfates	24 Hour	25 µg/m^3	—	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	30-day	1.5 µg/m^3	—	(a) Learning disabilities; (b) Impairment of blood formation and nerve conduction
	Quarter	—	1.5 µg/m^3	

Abbreviations:
ppm = parts per million µg/m^3 = micrograms per cubic meter
Mean = Annual Arithmetic Mean 30-day = 30-day average Quarter = Calendar quarter

Source: South Coast Air Quality Management District, 2007 AQMP. CARB, Ambient Air Quality Standards, 2007.

2.1.2 - South Coast Air Quality Management District

The air pollution control agency for the South Coast Air Basin (Basin) is the SCAQMD. SCAQMD is responsible for controlling emissions primarily from stationary sources. SCAQMD maintains air quality monitoring stations throughout the Basin. SCAQMD, in coordination with the Southern

California Association of Governments (SCAG), is also responsible for developing, updating, and implementing the AQMP for the Basin. An AQMP is a plan prepared by an air pollution control district for a county or region designated as a nonattainment area for bringing the area into compliance with the requirements of the national and/or California ambient air quality standards. The term nonattainment area is used to refer to an air basin where ambient air quality standards are exceeded. The current AQMP for SCAQMD is the 2007 AQMP. The 2007 AQMP was adopted by the SCAQMD Governing Board on June 1, 2007 with the exception of the Transportation Conformity Budgets. The SCAQMD Governing Board adopted the 2007 AQMP Transportation Conformity Budgets at their July 13, 2007 meeting. The AQMP is designed to meet the state and federal Clean Air Act planning requirements and focuses on ozone and $PM_{2.5}$. The AQMP incorporates significant new emissions inventories, ambient measurements, scientific data, control strategies, and air quality modeling.

Rules Applicable to the Project

The rules and regulations that apply to this project include but are not limited to the following:

- SCAQMD Rule 403, which governs emissions of fugitive dust. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour (mph), sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites.

- SCAQMD Rule 1108 governs the sale, use, and manufacturing of asphalt and limits the ROG content in asphalt used in the South Coast Air Basin. Although this rule does not directly apply to the project, it does dictate the ROG content of asphalt available for use during the construction.

- SCAQMD Rule 1113 governs the sale, use, and manufacturing of architectural coating and limits the ROG content in paints and paint solvents. Although this rule does not directly apply to the project, it does dictate the ROG content of paints available for the use during the construction of buildings.

- SCAQMD Rule 402 governs the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

2.1.3 - Local Government

The local government with jurisdiction over the Project area is the County of San Bernardino. In 2007, the County of San Bernardino adopted a General Plan (SBC 2007). The General Plan contains the goals, policies, and implementing actions for a variety of issues including natural and man-made hazards and natural and man-made resources; sets the framework for decision-making regarding the County's long-term development and utilization of resources; provides the data and analyses to support that decision-making framework; provides the rules by which land can be developed (what, where, and under what conditions); provides a consensus vision of what the citizens and Board of Supervisors want for the County's future; and establishes the operating rules for achieving that vision. Listed below are policies and programs contained in the General Plan that are pertinent to the protection of air quality.

Land Use Element

- **LU 8.1** – Potentially polluting, hazardous, and other health risk facilities should be located no closer than one-quarter mile to a sensitive receptor and vice versa.
- **LU 8.2** – Review development proposals to minimize impacts, such as air emissions, on sensitive receptors.
- **LU 9.2** – Discourage leap-frog development and urban sprawl by restricting the extension or creation of new urban services or special districts to areas that cannot be sustained in a fiscally responsible manner.

Circulation and Infrastructure Element

- **CI 3.1** – Encourage the reduction of automobile usage through various incentive programs.
- **CI 4.2** – To reduce the dependence on the automobile for local trips, integrate transportation and land use planning at the community and regional levels by promoting transit-oriented development (TOD), where appropriate and feasible.
- **CI 6.1** – Require safe and efficient pedestrian and bicycle facilities in residential, commercial, industrial, and institutional developments to facilitate access to public and private facilities and to reduce vehicular trips. Install bicycle lanes and sidewalks on existing and future roadways, where appropriate and as funding is available.
- **CI 6.3** – Retain residual road dedication that may result whenever a road is changed to a lower highway designation, thus reducing the required right-of-way, until it is determined that such dedication will not be needed for bicycle, pedestrian or equestrian trail purposes.
- **M/CI 1.10** – Support the development of park and ride transit service in the mountain communities.
- **M/CI 1.11** – When population and residential densities permit or warrant, develop shuttle services from residential neighborhoods to recreational areas and major commercial centers

Housing Element

- **H 2.5** – Continue to evaluate residential developments with emphasis on energy-efficient design and siting options that are responsive to local climatic conditions and applicable laws.
- **H 2.10** – Encourage the use of energy conservation features in residential construction, remodeling, and existing homes.

Conservation Element

- **CO 4.1** – Because developments can add to the wind hazard (due to increased dust, the removal of wind breaks, and other factors), the County will require either as mitigation measures in the appropriate environmental analysis required by the County for the development proposal or as conditions of approval if no environmental document is required, that developments in areas identified as susceptible to wind hazards to address site-specific analysis of:

  a) Grading restrictions and/or controls on the basis of soil types, topography, or season.
  b) Landscaping methods, plant varieties, and scheduling to maximize successful revegetation.
  c) Dust-control measures during grading, heavy truck travel, and other dust generating activities.

- **CO 4.2** – Coordinate air quality improvement technologies with the SCAQMD and the Mojave Air Quality Management District (MAQMD) to improve air quality through reductions in pollutants from the region.

- **CO 4.3** – The County will continue to ensure through coordination and cooperation with all airport operators a diverse and efficient ground and air transportation system, which generates the minimum feasible pollutants.

- **CO 4.4** – Because congestion resulting from growth is expected to result in a significant increase in the air quality degradation, the County may manage growth by insuring the timely provision of infrastructure to serve new development.

- **CO 4.5** – Reduce emissions through reduced energy consumption.

- **CO 4.6** – Provide incentives such as preferential parking for alternative-fuel vehicles (e.g., CNG or hydrogen).

- **CO 4.8** – Replace existing vehicles in the County fleet with the cleanest vehicles commercially available that are cost-effective and meet the vehicle use needs.

- **CO 4.9** – Manage the County's transportation fleet fueling standards to improve the number of alternative fuel vehicles in the County fleet.

- **CO 4.10** – Support the development of alternative fuel infrastructure that is publicly accessible.

- **CO 4.11** – Establish programs for priority or free parking on County streets or in County parking lots for alternative fuel vehicles.

- **CO 4.12** – Provide incentives to promote siting or use of clean air technologies (e.g., fuel cell technologies, renewable energy sources, UV coatings, and hydrogen fuel).

- **CO 8.6** – Fossil fuels combustion contributes to poor air quality. Therefore, alternative energy production and conservation will be required, as follows:

    a) New developments will be encouraged to incorporate the most energy-efficient technologies that reduce energy waste by weatherization, insulation, efficient appliances, solar energy systems, reduced energy demand, efficient space cooling and heating, water heating, and electricity generation.

    b) All new subdivisions for which a tentative map is required will provide, to the extent feasible, for future natural heating or cooling opportunities in the subdivision. This can be accomplished by design of lot size and configuration for heating or cooling from solar exposure or shade and breezes, respectively.

    c) For all new divisions of land for which a tentative map is required, a condition of approval will be the dedication of easements, for the purpose of assuring solar access, across adjacent parcels or units.

- **CO 8.8** – Promote energy-efficient design features, including appropriate site orientation, use of lighter color roofing and building materials, and use of deciduous shade trees and windbreak trees to reduce fuel consumption for heating and cooling.

- **CO 8.9** – Promote the use of automated time clocks or occupant sensors to control central heating and air conditioning.

2.1.4 - Global Climate Change

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). The effect is analogous to the way a greenhouse retains heat. Common GHGs include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, Perfluorocarbons, and sulfur hexafluoride. Both natural processes and human activities emit GHGs. However, it is believed that emissions from human activities, such as electricity production and vehicle exhaust, have elevated the concentration of these gases in the atmosphere, leading to a trend of unnatural warming of the Earth's climate, known as global warming or climate change.

Global climate change alleged to be caused by GHGs is currently one of the most important and widely debated scientific, economic, and political issues in the United States. Global climate change

is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages. Some data indicates that the current temperature record differs from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of GHGs at 400-450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below 2 degrees Celsius, which is assumed to be necessary to avoid dangerous climate change (IPCC 2001).

The State of California is a substantial contributor of global GHGs as it is the second largest contributor in the U.S. and the sixteenth largest in the world (CEC 2006). The California Energy Commission calculated that in 2004 California produced 492 million metric tons of carbon dioxide equivalent (CEC 2006).

Federal Regulation

The EPA currently does not regulate GHG emissions from motor vehicles. Massachusetts v. EPA (Supreme Court Case 05-1120) was argued before the United States Supreme Court on November 29, 2006, in which it was petitioned that EPA regulate four GHGs, including carbon dioxide, under Section 202(a)(1) of the Clean Air Act. A decision was made on April 2, 2007, in which the Court held that petitioners have a standing to challenge the EPA and that the EPA has statutory authority to regulate emissions of GHGs from new motor vehicles.

State Regulation

There has been significant legislative activity regarding global climate change and GHGs in California. California Assembly Bill 1493 (Pavley), enacted on July 22, 2002, required the CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Regulations adopted by the CARB would apply to 2009 and later model year vehicles. The CARB estimates that the regulation would reduce climate change emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S 3-05, the following GHG emission reduction targets:

1) by 2010, reduce GHG emissions to 2000 levels;
2) by 2020, reduce GHG emissions to 1990 levels; and
3) by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Climate Action Team

To meet these targets, the Governor directed the Secretary of the Cal EPA to lead a Climate Action Team (CAT) made up of representatives from the Business, Transportation and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the Air Resources Board; the Energy Commission; and the Public Utilities Commission. The CAT's Report to the Governor in 2006 (2006 CAT Report) contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

AB 32

Also in 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006, which charged the CARB to develop regulations on how the state would address global climate change. AB 32 focuses on reducing GHG emissions in California. Greenhouse gases, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, HFCs, PFCs, and SF6. AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. The CARB is the state agency charged with monitoring and regulating sources of emissions of GHGs that cause global warming in order to reduce emissions of GHGs. AB 32 requires that by January 1, 2008, the CARB must determine what the statewide GHG emissions level was in 1990, and it must approve a statewide GHG emissions limit so it may be applied to the 2020 benchmark. The CARB adopted the 1990 GHG emission inventory/2020 emissions limit of 427 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) on December 6, 2007.

The 2006 CAT Report contains baseline emissions as estimated by the CARB and the California Energy Commission. The emission reduction strategies reduce GHG emissions to the targets contained in AB 32; the 2006 CAT Report is consistent with AB 32.

SB 97

SB 97 was passed in August 2007. SB 97 indicates that Section 21083.05 will be added to the Public Resources Code, "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)" (SB 97). Section 21097 is also added to the Public Resources Code and indicates that the failure to analyze adequately the effects of GHGs in a document related to the environmental review of a transportation project funded under the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 does not create a cause of action for a violation. However, SB 97 does not safeguard non-transportation funded projects from being challenged in court for omitting a global climate change analysis.

OPR

The Governor's Office of Planning and Research (OPR) published a technical advisory on CEQA and Climate Change, as required under SB 97, on June 19, 2008. The guidance did not include a suggested threshold, but stated that the OPR has asked CARB to, "recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state." The OPR does recommend that CEQA analyses include the following components:

- • Identify GHG emissions;
- • Determine Significance; and
- • Mitigate Impacts.

The OPR has also started tracking environmental documents that contain GHG analysis and mitigation measures. The website "www.ceqamap.com" contains the list of documents in electronic form and is maintained by CEQAdocs.com.

CARB

Under AB 32, the CARB published its Final Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California. Discrete early action measures are currently underway or are enforceable by January 1, 2010. Early action measures are regulatory or non-regulatory and are currently underway or to be initiated by the CARB in the 2007 to 2012 timeframe. The CARB has 44 early action measures that apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. Of the 44 early action measures, nine are considered discrete early action measures, as they are regulatory and enforceable by January 1, 2010. The CARB estimates that implementation of all 44 recommendations will to result in reductions of at least 42 $MMTCO_2e$ by 2020, representing approximately 25 percent of the 2020 target. Note that the CARB currently defers measures involving General Plans and CEQA.

Under AB 32, the CARB has the primary responsibility for reducing GHG emissions. However, the CAT Report contains strategies that many other California agencies can take. The CAT published a public review draft of Proposed Early Actions to Mitigate Climate Change in California. Most of the strategies were in the 2006 CAT Report or are similar to the 2006 CAT strategies.

California is also exploring the possibility of cap and trade systems for GHGs. The Market Advisory Committee to the CARB published draft recommendations for designing a GHG cap and trade system for California.

Executive Order S-01-07

Executive Order S-01-07 was enacted by the Governor on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels

by at least 10 percent by 2020. It also requires that a Low Carbon Fuel Standard for transportation fuels be established for California.

California Air Pollution Control Officers Association White Paper

The California Air Pollution Control Officers Association has released a white paper entitled "CEQA & Climate Change," which discussed three alternative thresholds, including a no significance threshold, a zero increase threshold, and a non-zero threshold, as well as multiple analysis options. The white paper is a resource guide developed to support local governments, and details tools for GHG assessment, emission models, and mitigation strategies to reduce potentially significant GHG emissions from a project.

SCAQMD

The SCAQMD is currently in the process of developing a threshold of significance for GHG emissions. The SCAQMD's GHG CEQA Significance Thresholds Working Group released a draft threshold methodology in August 2008 (SCAQMD 2008b). The proposed threshold methodology is a "Tiered Decision Tree" approach based on the concept of business-as-usual (BAU). This approach contains a series of tiers to evaluate a project, starting with exemptions (Tier 1), continuing through consistency with regional plan GHG budgets (Tier 2), quantitative screening level threshold (Tier 3), performance standards (Tier 4), to application of emission offsets (Tier 5).

Local Public Agencies

The California Attorney General sued San Bernardino County based on the County's General Plan Update EIR. That case resulted in a settlement agreement between the County and the California Attorney General's office, filed with the Central District Superior Court of San Bernardino County on August 28, 2007. Under the settlement agreement, the County agreed to prepare an amendment to the General Plan to add a policy that describes the County's goal of reducing GHG attributable to the County's discretionary land use decisions and internal government operations. The County also agreed to prepare a Greenhouse Gas Emissions Reduction Plan. The settlement agreement details the contents of the Greenhouse Gas Emission Reduction Plan, including GHG inventories and emission reduction targets. Both the General Plan amendment and the Greenhouse Gas Emission Reduction Plan should be completed within 30 months of the execution of the settlement agreement. The settlement agreement also contains provisions for diesel engine exhaust control measures to be implemented by the County.

2.2 - Pollutants

Criteria air pollutants are those pollutants that have been determined by EPA or CARB to have detrimental health effects for "sensitive" populations such as people with asthma, children, and older adults and for which health criteria have been established. Criteria air pollutants have historically been reported in three main categories – stationary sources, areawide sources, and mobile sources. Stationary sources are those that generate emissions from a stationary location, usually associated

with manufacturing and industrial sources. Areawide sources are sources of emissions which are widely distributed and produce many emissions, individually small but collectively significant, such as consumer products, fireplaces, and solvent evaporation. Mobile source emissions are associated with motor vehicles and include on-road and off-road sources. On-road sources are emissions from vehicles, trucks, motorcycles, buses, etc. Off-road sources include equipment and vehicles in the following sectors: recreational, construction, mining, industrial, lawn and garden, farm, airport service, and rail. A brief summary of the criteria pollutants of concern follows.

2.2.1 - Carbon Monoxide

Description and Properties: Carbon monoxide (CO) is a colorless, odorless toxic gas produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). CO is a primary pollutant, which means that it is emitted directly into the air (unlike secondary pollutants like ozone that are formed by the reactions of other pollutants). CO levels tend to be highest during the winter months when the meteorological conditions favor the accumulation of the pollutants. This occurs when relatively low inversion levels trap pollutants near the ground and concentrate the CO. Because CO is somewhat soluble in water, normal winter conditions of rainfall and fog can suppress CO conditions.

Health Effects: CO is essentially inert to plants and materials but can have significant effects on human health. CO gas enters the body through the lungs, dissolves in the blood, and creates a solid bond to hemoglobin, not allowing it to form a loose bond with CO_2, which is essential to the CO_2/O_2 exchange to occur. This firm binding therefore reduces available oxygen in the blood and oxygen delivery to the body's organs and tissues. Effects on humans range from slight headaches to nausea to death from asphyxiation. Elevated levels of CO can also cause visual impairments, reduced manual dexterity, poor learning ability, reduced work capacity, and trouble performing complex tasks.

Sources: The primary source of CO is from on-road motor vehicles. It is a component of on-road motor vehicle exhaust, which contributes about 47 percent of all CO emissions in the Basin portion of San Bernardino County. Other non-road engines and vehicles (such as construction equipment and recreational boats) contribute about 28 percent. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust.

2.2.2 - Ozone

Description and Physical Properties: Ozone is what is known as a photochemical pollutant. Ozone is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between volatile organic compounds (VOC), NO_X, and sunlight. VOC and NO_X are emitted from automobiles, solvents, and fuel combustion. In order to reduce ozone, it is necessary to control emissions of these ozone precursors. Significant ozone formation generally requires an adequate

amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight. A reduction of ozone precursors reduces ozone. Ozone is a regional pollutant and is generated over a large area and is transported and spread by the wind. The conditions conducive to the formation of ozone include extended periods of daylight (solar radiation) and hot temperatures. These conditions are prevalent during the summer when thermal inversions are most likely to occur. As a result, summertime conditions of long periods of daylight and hot temperatures form ozone in the greatest quantities. During the summer, thermal inversions trap ozone from dispersing vertically, and high concentrations of this pollutant are prevalent.

Health Effects: Health effects of ozone can include the following: respiratory system irritation, reduction of lung capacity, asthma aggravation, inflammation, and damage to lung cells, aggravated cardiovascular disease, and permanent lung damage. The greatest health risk is to those who are more active outdoors during smoggy periods, such as children, athletes, and outdoor workers. Ozone also damages natural ecosystems such as forests and foothill communities, and damages agricultural crops and some man-made materials such as rubber, paint, and plastics.

Sources: Ozone is a secondary pollutant, thus is not emitted directly into the lower level of the atmosphere. The ozone precursors are NO_X and VOC. Sources of NO_X and VOC are addressed below.

2.2.3 - Nitrogen Oxides

Description and Physical Properties: During combustion of fossil fuels, oxygen reacts with nitrogen to produce NO_X (NO, NO_2, NO_3, N_2O, N_2O_3, N_2O_4, and N_2O_5). This occurs primarily in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. NO_X is also an ozone precursor, which means that when it is emitted into the atmosphere, it forms or causes ozone to be formed. When NO_X and VOC are released in the atmosphere, they can chemically react with one another in the presence of sunlight to form ozone. NO_X can also be a precursor to PM_{10} and $PM_{2.5}$.

Health Effects: EPA has concluded that the only form of NO_X that exists at a level high enough to cause public health concerns is nitrogen dioxide (NO_2). Nitrogen dioxide is a brown gas with a strong odor. NO_X can react with moisture, ammonia, and other compounds to form nitric acid and related particles. The main human health concerns of nitrogen dioxide include lung damage, increased incidence of chronic bronchitis, eye and mucus membrane damage, negative effects on the respiratory system, pulmonary dysfunction, and premature death. Small particles can penetrate deeply into the sensitive tissue of the lungs and can cause or worsen respiratory disease such as emphysema, asthma, and bronchitis, and can also aggravate existing heart disease.

Because NO_X is an ozone precursor, the health effects associated with ozone (as discussed above) are also indirect health effects associated with unhealthful levels of NO_X emissions.

Sources: Natural sources of NO_X include lightning, soils, wildfires, stratospheric intrusion, and the oceans, but natural sources only accounted for approximately two percent of emissions of NO_X in the Basin portion of San Bernardino County. The primary sources of NO_X in this area are heavy-duty diesel trucks, construction equipment and other off-road vehicles, and trains.

2.2.4 - Particulate Matter (PM_{10} and $PM_{2.5}$)

Description and Physical Properties: Particulate matter is a generic term that defines a broad group of chemically and physically different particles (either liquid droplets or solids) that can exist over a wide range of sizes. Examples of atmospheric particles include those produced from combustion (diesel soot or fly ash), light produced (urban haze), sea spray produced (salt particles), and soil-like particles from resuspended dust. In discussions of air pollution, particulate matter is typically divided into two size categories: PM_{10} and $PM_{2.5}$ because of the adverse health effects associated with the smaller sized particles. PM_{10} refers to particulate matter that is 10 microns or less in diameter (1 micron is one-millionth of a meter) and is conventionally known as Inhalable Particulate Matter. $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter and is conventionally known as Fine Particulate Matter. Soil dust consists of the minerals and organic material found in soil being lifted up into the air by winds. Fugitive dust is entrained particulate matter caused by anthropogenic (grading, road dust) or natural (windblown dust) activities.

Health Effects: Particulate matter can be inhaled directly into the lungs where it can be absorbed into the bloodstream. It is a respiratory irritant and can cause direct pulmonary effects such as coughing, bronchitis, lung disease, respiratory illnesses, increased airway reactivity, and exacerbation of asthma. Particulate matter is also thought to have direct effects on the heart. Relatively recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health effects include reduced visibility and soiling of property.

Sources: Particulate matter originates from a variety of stationary and mobile sources but in the Basin portion of San Bernardino County, the majority of PM_{10} emissions are from paved road dust and construction equipment. For $PM_{2.5}$, the same categories are major with the added category of wildfires.

Diesel Particulate Matter

A subset of particulate matter that is a matter of concern is Diesel Particulate Matter (DPM). Diesel exhaust is a mixture of many particles and gases that is produced when an engine burns diesel fuel. Many compounds found in diesel exhaust are carcinogenic, including sixteen that are classified as possibly carcinogenic by the International Agency for Research on Cancer. DPM includes the particle-phase particles in diesel exhaust. Components of DPM include elemental and organic carbon. Elemental carbon is carbon that has had hydrogen taken from it. Organic carbon contains molecules containing carbon and hydrogen, and can also contain oxygen, sulfur, and nitrogen.

Exposure to diesel exhaust can cause immediate health effects. Some of the health effects include eye, nose, and throat irritation as well as cough, nausea, and phlegm. The elderly, children, people with allergies, and those with asthma, emphysema, and chronic heart and lung disease are more susceptible to the effects of DPM.

2.2.5 - Volatile Organic Compounds and Reactive Organic Gases

Description and Physical Properties: VOC, or ROG, are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. VOC consist of nonmethane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. Nonmethane hydrocarbons are hydrocarbons that do not contain the unreactive hydrocarbon, methane. Oxygenated hydrocarbons are hydrocarbons with oxygenated functional groups attached.

It should be noted that there are no state or national ambient air quality standard for VOC because they are not classified as criteria pollutants. They are regulated, however, because a reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOC are also transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} and lower visibility.

Health Effects: Although health-based standards have not been established for ROG, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, concentrations of VOC are suspected to cause eye, nose, and throat irritation; headaches, loss of coordination, nausea, damage to liver, kidney, and the central nervous system.

Sources: VOC emissions result primarily from incomplete fuel combustion and the evaporation of chemical solvents and fuels. On-road mobile sources are the largest contributor to VOC emissions in the Basin portion of San Bernardino County, with most of that coming from light-duty vehicles, construction equipment and other off-road vehicles, and recreational boats. Areawide VOC sources in the area are primarily from consumer products.

2.2.6 - Greenhouse Gases

Gases that trap heat in the atmosphere are often called GHGs, analogous to a greenhouse. Greenhouse gases are emitted by natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without these natural GHGs, the Earth's surface would be about 61degrees Fahrenheit cooler (CA 2006). Emissions from human activities such as electricity production and vehicles have elevated the concentration of these gases in the atmosphere.

The California State Legislature adopted the California Global Warming Solutions Act of 2006 (AB-32), which requires CARB to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020. Greenhouse gases as defined under AB-32 include:

carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

Carbon Dioxide: Carbon dioxide (CO_2) is an odorless, colorless natural GHG. Outdoor levels of CO_2 are not high enough to result in negative health effects. However, CO_2 can be a concern as a GHG. CO_2 is emitted from natural and anthropocentric (human) sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood. CO_2 can also be removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks.

Methane: Methane (CH_4) is an extremely effective absorber of radiation, though its atmospheric concentration is less than CO_2 and its lifetime in the atmosphere is brief (10 to 12 years), compared to other GHGs. Methane has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen (anaerobic) environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane. Other anthropocentric sources include fossil-fuel combustion and biomass burning.

Nitrous Oxide: Nitrous oxide (N_2O), also known as laughing gas, is a colorless GHG. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used as an aerosol spray propellant, i.e., in whipped cream bottles. It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars.

Chlorofluorocarbons: Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in methane or ethane (C2H6) with chlorine and/or fluorine atoms. CFCs are no longer being used; therefore, it is not likely that health effects would be experienced. CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants, and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful, so much so that levels of the major CFCs are now remaining level or declining. The proposed project is not expected to generate or be exposed to CFCs because of the ban on chlorofluorocarbons. Therefore, it is not assessed in this report.

Hydrofluorocarbons: Hydrofluorocarbons (HFCs) are synthetic man-made chemicals that are used as a substitute for CFCs. Of all the GHGs, they are one of three groups with the highest global warming potential. Most HFCs do not have health effects associated with their direct emissions. HFCs are man made for applications such as automobile air conditioners and refrigerants. The project may emit a small amount of HFC emissions from leakage and service of refrigeration and air

conditioning equipment and from disposal at the end of the life of the equipment. However, the quantity is expected to be minimal because of the relative small size of the project and is not further evaluated.

Perfluorocarbons: Perfluorocarbons (PFCs) have stable molecular structures and do not break down though the chemical processes in the lower atmosphere. High-energy ultraviolet rays about 60 kilometers above Earth's surface are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. The two main sources of PFCs are primary aluminum production and semiconductor manufacture. Since PFCs are typically used in industrial applications, it is not anticipated that the project would emit any of these GHGs.

Sulfur Hexafluoride: Sulfur hexafluoride (SF6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection. Since sulfur hexafluorides are typically used in industrial and specialized manufacturing applications, it is not anticipated that the project would emit any of these GHGs.

2.3 - Physical Setting

2.3.1 - Local Climate

The project is located near the community of Fawnskin, on the north shore of Big Bear Lake in San Bernardino County. This region is located within the South Coast Air Basin (Basin). Regional and local air quality is impacted by dominant airflows, topography, atmospheric inversions, location, season, and time of day.

The presence and intensity of sunlight are necessary prerequisites for the formation of ozone. Under the influence of the ultraviolet radiation of sunlight, certain primary pollutants (mainly VOC and NO_X) react to form a secondary pollutant – ozone. Since this process is time dependent, ozone can be formed many miles downwind from the emission sources. Because of the prevailing daytime winds and time-delayed nature of ozone, concentrations are highest in the inland areas of Southern California. However, a majority of the smog in the Big Bear Valley is created by the transport of pollutants from Los Angeles, Riverside, and San Bernardino Counties as opposed to local sources.

The climate in the Basin is characterized by moderate temperatures and comfortable humidities with precipitation limited to a few storms during the winter season (November through April). The average annual temperature varies little throughout the Basin, averaging 75 degrees Fahrenheit (ºF). More specifically, the Community of Fawnskin enjoys an Alpine climate. The Community is located in an area that intercepts water-laden clouds that can result in rainfall and/or snow. Precipitation at Big Bear Lake's National Weather Service station from 1960 to 2006 averaged about 18 inches for the six-month period from November to April and the average snowfall for January, February, and March is above 14 inches per month. The area's watershed is mountainous with steep upper slopes

leading to a mildly sloping valley. The coolest month of the year is January with a mean monthly temperature of 33.7 ºF. The warmest month is July with a mean monthly temperature of 63.9 ºF.

Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. The mountains surrounding the Los Angeles region form natural horizontal barriers to the dispersion of air contaminants. Air pollution created in the coastal areas and around the Los Angeles area is transported inland until it reaches the mountains where the combination of mountains and inversion layers generally prevent further dispersion. The area in which the Community of Fawnskin is located offers approximately 300 days/year of clear skies and sunshine and is above the typical inversion altitudes of the Los Angeles area; however, it is still susceptible to air inversions. This traps a layer of stagnant air near the ground where it is further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, wood stoves, and other sources.

2.3.2 - Local Air Quality

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. SCAQMD has divided the basin into 38 Source Receptor Areas (SRA) for evaluation purposes and operates monitoring stations within each one. Existing levels of ambient air quality and historical trends and projections of air quality in the project area are best documented from measurements made near the project site. SCAQMD operates an air monitoring station in Big Bear City, approximately 4 miles east of the project but it only measures $PM_{2.5}$. The nearest site that measures PM_{10} is located in Lucerne Valley at the Middle School, approximately 10 miles north of the project, which is operated by the Mojave Desert Air Quality Management District. The nearest ozone monitor is operated by the SCAQMD and is located at Lake Gregory – Crestline, approximately 20 miles west of the project site. Table 2 summarizes 2004-2006 published monitoring data for the nearest monitors measuring nonattainment pollutants. The SCAQMD and CARB have decided that the only pollutant of concern enough to be monitored in the area where the project is located is $PM_{2.5}$. PM_{10} and ozone monitoring information are supplied for informational purposes but may not represent accurate localized conditions of the project site.

Table 2: Air Quality Monitoring Summary

Air Pollutant, Averaging Time (Units)	2004	2005	2006
Ozone - Crestline			
Max 1 Hour (ppm)	0.163	0.182	0.164
Days > CAAQS (0.09 ppm)	75	80	73
Days > NAAQS (0.12 ppm)*	9	18	–
Max 8 Hour (ppm)	0.145	0.145	0.142
Days > CAAQS (0.070 ppm)*	–	119	103
Days > NAAQS (0.08 ppm)	66	69	59

Table 2: Air Quality Monitoring Summary (Cont.)

Air Pollutant, Averaging Time (Units)	2004	2005	2006
Particulate Matter (PM_{10}) – Lucerne Valley			
Mean ($\mu g/m^3$)	18.1	19.1	23.0
24 Hour ($\mu g/m^3$) Days > CAAQS (50 $\mu g/m^3$) Days > NAAQS (150 $\mu g/m^3$)	47 0 0	57 1 0	50 0 0
Particulate Matter ($PM_{2.5}$) – Big Bear City			
Mean ($\mu g/m^3$)	NA	NA	NA
24 Hour ($\mu g/m^3$) Days > NAAQS (35 $\mu g/m^3$)	28.6 0	38.7 0	40.0 0

Abbreviations:
> = exceed ppm = parts per million $\mu g/m^3$ = micrograms per cubic meter
NA = not available max = maximum Mean = Annual Arithmetic Mean
CAAQS = California Ambient Air Quality Standard NAAQS = National Ambient Air Quality Standard

Note: NAAQS for 1-hour ozone and the CAAQS for 8-hour are presented for the years the standards were in effect

Source: CARB Air Quality Data/Statistics/Top 4 Summary, 6/1/2007.

Local Sources of Air Pollutants

The project area is primarily a resort area with recreational activities for all four seasons. The primary source of local pollution is vehicular in both summer and winter, with the addition of wood smoke during the winter. Recreational boating is also a CO and VOC source.

2.3.3 - Alternate forms of Transportation

The Mountain Area Regional Transit Authority (MARTA) is the primary public transportation provider on the mountain-top, providing local and off-the-mountain bus service to the Big Bear Valley, Running Springs, Lake Arrowhead, Crestline, and San Bernardino. The agency operates both fixed route and demand-response services (Dial-A-Ride). MARTA has connecting services to Metrolink, Omnitrans, and Greyhound.

2.3.4 - Attainment Status

Air basins where ambient air quality standards are exceeded are referred to as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are classified as severe, serious, or moderate as a function of deviation from standards.

The current attainment designations for the project area are shown in Table 3. The "attainment year" is the goal of the existing 2003 AQMP and 2007 AQMP. The basin is in state non-attainment for ozone, PM_{10}, and $PM_{2.5}$, and is in federal nonattainment for ozone, CO, PM_{10}, and $PM_{2.5}$. Note that

CO is still classified as "serious nonattainment" for the federal CO standard even though the attainment date has passed and the basin met the CO standard by December 2002. In 2004, SCAQMD requested that EPA re-designate the basin as in attainment with the CO ambient air quality standard, but EPA has not made a formal action to do so. The 2003 AQMP served as a maintenance plan for CO, and the 2007 AQMP is an update to that maintenance plan.

Table 3: Attainment Status

Pollutant	State Status	National Status [Attainment Year]
Ozone (1-hour)	Nonattainment	Not Subject
Ozone (8-hour)	Nonattainment	Severe Nonattainment [2021]
Carbon Monoxide	Attainment	Serious Nonattainment [2000]
Nitrogen Dioxide	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
PM_{10}	Nonattainment	Serious Nonattainment [2006]
$PM_{2.5}$	Nonattainment	Nonattainment [2015]
Source: State Status from CARB, 2006. National Status from U.S. EPA, 2007.		

2.4 - Global Climate Change

Global climate change alleged to be caused by GHGs is currently one of the most important and widely debated scientific, economic, and political issues in the United States. Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages. Some data indicates that the current temperature record differs from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of GHGs at 400-450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below 2 degrees Celsius, which is assumed to be necessary to avoid dangerous climate change (IPCC 2001).

Potential Environmental Effects

Worldwide, average temperatures are likely to increase by 1.8 degrees Celsius (°C) to 4°C, or approximately 3 degrees Fahrenheit (°F) to 7 °F by the end of the 21st Century (IPCC 2007a). However, a global temperature increase does not translate to a uniform increase in temperature in all locations on the earth. Regional climate changes are dependant on multiple variables, such as topography. One region of the Earth may experience increased temperature, increased incidents of drought and similar warming effects, whereas another region may experience a relative cooling.

According to the IPCC's Working Group II Report, Climate Change impacts to North America may include (IPCC 2007b): diminishing snowpack; increasing evaporation; exacerbated shoreline erosion; exacerbated inundation from sea level rising; increased risk and frequency of wildfire; increased risk of insect outbreaks; increased experiences of heat waves; and, rearrangement of ecosystems, as species and ecosystem zones shift northward and to higher elevations.

For California, Climate Change has the potential to incur/exacerbate the following environmental impacts (CAT 2006):

- Increased frequency, duration, and intensity of conditions conducive to air pollution formation (particularly ozone);
- Reduced precipitation;
- Changes to precipitation and runoff patterns;
- Reduced snowfall (precipitation occurring as rain instead of snow);
- Earlier snowmelt;
- Decreased snowpack;
- Increased agricultural demand for water;
- Intrusion of seawater into coastal aquifers;
- Increased agricultural growing season;
- Increased growth rates of weeds, insect pests and pathogens;
- Inundation of low-lying coastal areas by sea level rise;
- Increased incidents and severity of wildfire events; and
- Expansion of the range and increased frequency of pest outbreaks.

Although certain environmental effects are widely accepted to be a potential hazard to certain locations, such as rising sea level for low-laying coastal areas, it is currently infeasible to predict all environmental effects of climate change on any one location.

SECTION 3: THRESHOLDS

3.1 - CEQA Guidelines

The following significance thresholds were derived from Appendix G of the CEQA guidelines. A significant impact would occur if the proposed project would:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Violate any air quality standard or contribute substantially to an existing or protected air quality violation;

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

d) Expose sensitive receptors to substantial pollutant concentrations;

e) Create objectionable odors affecting a substantial number of people; or

f) Results in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone).

While the final determination of whether or not a project is significant is within the purview of the lead agency pursuant to §15064(b) of the State CEQA Guidelines, the SCAQMD recommends that the following quantitative air pollution thresholds be used by the lead agencies in determining whether the proposed project could result in a significant impact. If the lead agency finds that the proposed project has the potential to exceed these air pollution thresholds, the project should be considered significant. These thresholds have been defined by SCAQMD for the Basin based on scientific data the SCAQMD has obtained and factual data within the federal and state Clean Air Acts. Since the project is located within the Basin and current air quality in the project area is typical of the air basin as a whole, these thresholds are considered valid and reasonable. Each of these threshold factors is discussed below.

3.2 - Regional Significance Thresholds

The following regional significance thresholds have been established by SCAQMD. Projects within the Basin region with construction- or operation-related emissions in excess of any of the thresholds presented in Table 4 are considered significant.

Table 4: SCAQMD Regional Thresholds

Pollutant	Construction (pounds per day)	Operation (pounds per day)
Oxides of Nitrogen (NO_X)	100	55
Volatile Organic Compounds (VOC)	75	55
Particulate Matter (PM_{10})	150	150
Particulate Matter ($PM_{2.5}$)	55	55
Oxides of Sulfur (SO_X)	150	150
Carbon Monoxide (CO)	550	550
Source: South Coast Air Quality Management District, 2006.		

3.3 - Local Significance Thresholds

Construction

The SCAQMD Governing Board adopted a methodology for calculating localized air quality impacts through localized significance thresholds (LSTs), which is consistent with SCAQMD's Environmental Justice Enhancement Initiative I-4. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable state or national ambient air quality standard. The LSTs are developed based on the ambient concentrations of that pollutant for each source receptor area and are applicable to NO_X, CO, PM_{10}, and $PM_{2.5}$.

The project is located in Source Receptor Area 38. Even though the Project's construction activity is limited to the construction of the interior streets and infrastructure and no grading of individual lots is proposed, again in order to evaluate worst-case conditions, it is assumed that construction on the 50 lots will occur over a 12 month period and that a maximum of 4 acres would be disturbed per day. Using the 2003-2005 look-up tables provided in the LST Guidelines for a conservative 5 acres per day disturbed at a receptor distance of 25 meters, Table 5 shows the appropriate LST's for construction activity.

Table 5: SCAQMD Localized Thresholds for Construction

Pollutant	Localized Significance Threshold (lbs/day)
Nitrogen Dioxide (NO_2)	439
Carbon Monoxide (CO)	1,363
Particulate Matter (PM_{10})	14
Particulate Matter ($PM_{2.5}$)	9
Source: South Coast Air Quality Management District, 2003 and 2006.	

LSTs for operational emissions only apply to onsite sources. Since the primary source of emissions for this project is associated with offsite vehicle trips, an LST analysis of long-term emissions is not required.

Nuisance

The SCAQMD has a regulation that governs the discharge from any source such quantities of air contaminants, which cause a nuisance or annoyance to any considerable number of persons or to the public. Creating the potential for a violation of the SCAQMD's Nuisance Rule (Rule 402) would create a potentially significant effect.

3.4 - Global Warming Project Level Thresholds

The potential effect of GHG emissions on climate change is an emerging issue that warrants discussion under CEQA. Unlike the pollutants discussed above that may have regional and/or local effects, Project-generated GHG emissions do not directly produce local or regional environmental impacts, but may contribute to an impact on global climate. Individual projects contribute relatively small amounts of GHGs that, when added to all other GHG emitting activities around the world, result in global increases in these emissions. Local or regional environmental effects may occur if the regional or local climate is changed. For the purposes of analyzing the Project's potential to contribute to climate change, the following threshold will be used:

> Does the Project comply with provisions of an adopted Greenhouse Gas Reduction Plan or Strategy? If no such Plan or Strategy is applicable, would the Project significantly hinder or delay California's ability to meet the reduction targets contained in AB 32?

3.5 - Cumulative Impact Thresholds

Section 15130(b) of the CEQA Guidelines states the following:

> The following elements are necessary to an adequate discussion of significant cumulative impacts: 1) Either a list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or areawide conditions contributing to the cumulative impact.

In accordance with CEQA Guidelines 15130(b), this analysis of cumulative impacts incorporates a summary of projections. The following tiered approach is to assess cumulative air quality impacts. This approach includes the analysis of the following:

1. Regional analysis of project air pollutants;
2. Project consistency with existing air quality plans; and
3. Assessment of the cumulative health effects of the pollutants;

SECTION 4: IMPACT ANALYSIS

This section analyzes the potential impacts of the proposed project on the air quality in the area surrounding the site. It calculates the expected emissions from the construction and operation of the project as a necessary requisite for assessing the regulatory significance of project emissions on a local and regional level and contains an analysis of the criteria in the CEQA guidelines regarding air quality as well as an assessment of project conformity with the General Plan.

4.1 - Short-Term Impacts

Short-term impacts will include fugitive dust and other particulate matter, as well as exhaust emissions generated by earthmoving activities and operation of grading equipment during site preparation. Construction emissions are caused by onsite or offsite activities. Onsite emissions principally consist of exhaust emissions (NO_X, CO, VOC, PM_{10}, and $PM_{2.5}$) from heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM_{10}) from disturbed soil. Offsite emissions are caused by motor vehicle exhaust from delivery vehicles, as well as worker traffic, but also include road dust (PM_{10}). Major construction-related activities include the following:

- Grading/clearing, including the excavation;
- Excavation and earth moving for infrastructure construction of the utilities, both on and offsite, and dwelling unit foundations and footings;
- Building construction;
- Asphalt paving of access roads throughout the development; and
- Application of architectural coatings for things such as dwelling stucco and interior painting.

Construction equipment such as scrapers, bulldozers, forklifts, backhoes, water trucks, and industrial saws are expected to be used on the project site and will result in exhaust emissions consisting of CO, NO_X, VOC, PM_{10}, and $PM_{2.5}$. During the finishing phase, paving operations and application of architectural coatings will release VOC emissions. Construction emission can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. For the purposes of determining worst-case emissions and including reasonably foreseeable results, this Report assumes that the only the area of the home site will be graded with approximately 4 acres being the maximum acreage graded on any one day. Equipment usage was estimated using the Recommended Construction Fleet Calculator created for their Indirect Source Review Regulation (http://www.valleyair.org/ISR/ISRResources.htm). It was assumed that construction equipment would operate for 6 to 8 hours per day and the entire construction period would last for 12 months.

4.1.1 - Unmitigated Short-Term Emissions

Table 6 summarizes these construction-related emissions (without mitigation). The emission estimates were derived from the project description using the URBEMIS 2002 Version 8.7 emission model. The URBEMIS data files are provided in Appendix A.

Table 6: Short-Term Emissions (Unmitigated)

Source	Emissions (maximum pounds per day)						
	VOC	NO_X	CO	PM_{10} Exhaust	PM_{10} Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Dust
Site Grading	8.09	49.85	68.64	1.81	41.60	1.67	8.74
Building Construction	69.30	53.32	67.76	1.91	0.09	1.76	0.02
Maximum lbs/day	**69.30**	**53.32**	**68.64**	**43.54**		**10.49**	
Regional Threshold	75	100	550	150		55	
Significant Impact?	No	No	No	No		No	
Local Significant Threshold	NA	439	1,363	14		9	
Significant Impact?		No	No	**Yes**		**Yes**	

NA =Not applicable
Source: URBEMIS, MBA 2007

The information shown in the above table indicates that the SCAQMD regional emission thresholds will not be exceeded by any pollutant but the locally significant thresholds will be potentially exceeded for PM_{10} and $PM_{2.5}$ emissions.

Level of Significance before Mitigation

Potentially Significant – Without mitigation, the short-term emissions are considered to have a significant local impact for particulate matter but a less than significant regional impact.

It is important to note that a previous analysis for a project on this site — Moon Camp TT #16136 EIR) — had a significant and unavoidable impact to the short-term construction emissions of ROG and NO_X. A review of the analysis showed that the majority of the ROG emissions were assigned to architectural coatings off-gas. Used in the old analysis was the default emissions factor for architectural coating, however, that does not reflect the effect of the SCAQMD's Architectural Coatings Rule (Rule 1113). The majority of the NO_X emissions from came from construction equipment exhaust. The updated URBEMIS version uses emission factors that are more up-to-date and more accurately reflect the current fleet of construction equipment.

4.1.2 - Construction Mitigation

AQ-1 Prior to construction of the project, the project proponent will provide a Fugitive Dust Control Plan that will describe the application of standard best management practices to

control dust during construction. The Fugitive Dust Control Plan shall be submitted to the County and SCAQMD for approval and approved prior to construction. Best management practices will include, but not be limited to:

- For any earth moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
- For all disturbed surface areas (except completed grading areas), apply dust suppression in a sufficient quantity and frequency to maintain a stabilized surface; any areas which cannot be stabilized, as evidenced by wind driven dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
- For all inactive disturbed surface areas, apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind-driven fugitive dust, excluding any areas that are inaccessible due to excessive slope or other safety conditions.
- For all unpaved roads, water all roads used for any vehicular traffic once daily and restrict vehicle speed to 15 mph.
- For all open storage piles, apply water to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust.

AQ-2 To reduce emissions from the construction equipment within the project site, the construction contractor will:

- To the extent that equipment and technology is available and cost effective, the contractor shall use catalyst and filtration technologies.
- All diesel-fueled engines used in construction of the project shall use ultra-low sulfur diesel fuel containing no more than 15-ppm sulfur, or a suitable alternative fuel.
- All construction diesel engines, which have a rating of 50 hp or more, shall meet the Tier II California Emission Standards for off-road compression-ignition engines, unless certified by the contractor that such engine is not available for a particular use. In the event that a Tier II engine is not available, Tier I compliant or 1996 or newer engines will be used preferentially. Older engines will only be used if the contractor certifies that compliance is not feasible.
- Heavy duty diesel equipment will be maintained in optimum running condition.

4.1.3 - Short-Term Construction Emissions after Mitigation

Using the URBEMIS model and applying construction mitigation, short-term emissions on PM_{10} and $PM_{2.5}$ after implementation of the above mitigation measures were estimated and are provided in Table 7. As shown in Table 7, short-term localized construction emissions are expected to be less than significant after application of mitigation measures.

Table 7: Short-term Emissions of PM_{10} & $PM_{2.5}$ (Mitigated)

Source	Emissions (maximum lbs/d)	
	PM_{10}	$PM_{2.5}$
Site Grading	6.57	1.64
Building Construction	6.59	1.65
Maximum lbs/day	**6.59**	**1.65**
Local Significant Threshold	14	9
Significant Impact?	No	No
Source: MBA 2007		

Level of Significance after Mitigation

Less than Significant.

4.2 - Long-Term Impacts

Long-term emissions for the proposed development are considered for project build-out. Emission sources consist of mobile emissions and stationary emissions. Mobile emissions estimates are derived from motor vehicle traffic. Stationary emissions estimates are derived from the consumption of natural gas, electricity and consumer products, as well as emissions resulting from landscape maintenance. Assumptions relevant to model input for the long-term emissions estimates are:

- The project is assumed to generate 479 average daily trips at buildout of the project (2008);
- Natural gas consumption is based on the residential land use;
- Landscape equipment emissions during the summer are based on default rates within the URBEMIS 2002 model for residential land uses at buildout year 2008; and
- Fireplace hearth emissions during the wintertime assume the conservative URBEMIS default of that 35 percent of the units would have wood stoves, 10 percent would have wood fireplaces, and 55 percent would have natural gas fireplaces;

Since the proposed project is at an altitude of over 5,000 feet and basic exhaust emission rates are based on tests at CARB's Haagen-Smit Laboratory at and altitude of 300 feet, emission rates from

vehicles in the vicinity of the project may not be accurately represented in the URBEMIS calculations. According to CARB's on-road motor vehicle emissions model methodology (CARB 2000), some older technology vehicles emit more VOC and CO emissions and fewer NO_X emissions when at higher altitudes. This is a special concern for vehicles operating above 5,000 feet elevation. At higher altitudes, the air pressure and air density is lower than that at sea level. Older technology vehicles, designed for operation at sea level, were not equipped with adaptive fuel controls to reduce the fuel flow for operation at high altitudes. Hence, older technology vehicles tended to run rich at higher altitudes. This increased VOC and CO emissions but suppressed NO_X formation due to the quenching effect of the excess fuel.

Therefore, CARB established correction factors of 1.3 for VOC, 1.9 for CO, and 0.6 for NO_X to be applied to the running exhaust and continuous starting emissions for operation above 5,000 feet (CARB 2000). However, these correction factors are only applicable to older technology gasoline fueled vehicles. Newer technology vehicles have adaptive fuel controls that compensate for higher altitudes. CARB determined that the correction factor would only apply to the Technology Groups listed in Table 8.

Table 8: Technology Groups with Altitude Correction Factors

Tech Group	Model Years	Technology Group Description
1	Pre-1975	With Secondary Air
2	Pre-1975	Without Secondary Air
3	1975-1982	No Catalyst
4	1975-1976	Oxidation Catalyst with Secondary Air
5	1975-1979	Oxidation Catalyst without Secondary Air
6	1980-1989	Oxidation Catalyst without Secondary Air
7	1977-1987	Oxidation Catalyst with Secondary Air
Source: (CARB 2000)		

An analysis of EMFAC2007 for the Basin portion of San Bernardino County for the current year (2007), buildout year (2008), and long-term operations (2030) was conducted. Results of this analysis are presented in Appendix B. The number of vehicles operating in these technology groups as a percentage of all vehicles was determined to be only 2.78 percent in 2007, 1.69 percent in 2008, and 0 percent in 2030. Therefore, it was determined that further application of correction factors would not be necessary due to the negligible effect on the total emissions.

An estimate of the daily total long-term project emissions is derived by combining both mobile and stationary emissions (natural gas consumption, consumer product consumption, hearth use, paint applications, and landscape maintenance). Using the model URBEMIS, total daily emissions were

estimated for summer and winter. Table 9 shows long-term estimated daily total summer emissions and Table 10 shows winter emissions.

Table 9: Long-Term Emissions (summer)

Pollution Source	Emissions (pounds per day)				
	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$
Mobile Emissions	3.48	6.06	43.49	4.86	1.21
Natural Gas Consumption	0.05	0.63	0.27	NG	NG
Landscape Emissions	0.25	0.01	1.74	0.01	NG
Consumer Products	2.45	NG	NG	NG	NG
Architectural Coatings	1.70	NG	NG	NG	NG
Combined Emissions Totals (lbs/day)	**7.93**	**6.70**	**45.50**	**4.87**	**1.21**
Regional Threshold	55	55	550	150	55
Exceed Threshold?	No	No	No	No	No

NG = negligible
Source: URBEMIS, MBA 2007

Table 10: Long-Term Emissions (winter)

Pollution Source	Emissions (pounds per day)				
	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$
Mobile Emissions	4.23	7.23	52.66	4.86	1.21
Natural Gas Consumption	0.05	0.63	0.27	NG	NG
Hearth Emissions	28.38	0.98	51.91	7.74	7.12
Consumer Products	2.45	NG	NG	NG	NG
Architectural Coatings	1.70	NG	NG	NG	NG
Combined Emissions Totals (lbs/day)	**36.81**	**8.84**	**104.84**	**12.60**	**7.39**
Regional Threshold	55	55	550	150	55
Exceed Threshold?	No	No	No	No	No

NG = negligible
Source: URBEMIS, MBA 2007

Level of Significance before Mitigation

Less than Significant – When emissions projections are compared with the SCAQMD suggested regional thresholds for significance; it is shown that long-term emissions are below all the applicable thresholds.

It is important to note that a previous analysis for a project on this site — Moon Camp TT #16136 EIR) — had a significant and unavoidable impact to the regional levels of ROG, CO, and PM_{10}. A

review of the analysis showed that the majority of the emissions were assigned to wood fireplaces. The analysis used the URBEMIS model version available at the time (Version 7G), which has been determined to have had an error in calculating emissions from hearth activities. The emissions calculated for this report used the current version of URBEMIS (Version 8.7), which is considered more reliable.

4.2.1 - CO Hotspots

Carbon monoxide (CO) is a localized problem requiring additional analysis beyond total project emissions quantification. Projects with sensitive receptors or projects that could negatively impact levels of service (LOS) of existing roads need to use the University of California Davis, Institute of Transportation Studies document *Transportation Project-Level Carbon Monoxide Protocol (CO Protocol)* (UCD 1997) (hereafter referred to as the *CO Protocol*) to determine the potential to create a CO hot spot. A CO hot spot is a localized concentration of CO that is above the State or Federal 1-hour or 8-hour ambient air standards. Localized high levels of CO are associated with traffic congestion and idling or slow-moving vehicles. The proposed project has the potential to negatively impact the LOS on adjacent roadways as well as have idling vehicles queued in the drive-thru area and therefore, requires a CO hotspot analysis.

The significance of project-related CO impacts is generally based on guidance presented in the CO Protocol. This document presents a series of criteria that are used to determine the significance of impacts. The impact on CO is considered significant if the project will:

- Degrade operation of an intersection to level of service (LOS) E or F, or
- Substantially worsen an intersection already operating at LOS F.

For the purposes of determining potential impacts on CO concentrations, a screening procedure was developed to allow the conservative evaluation of CO concentrations without having to run computational models such as EMFAC and CALINE4. Screening procedures provide a relationship among CO concentrations and the most important parameters that affect those concentrations. The screening procedure is contained in the *CO Protocol*. The Protocol states that the determination of project-level CO impacts should be carried out according to a Local Analysis flow chart.

As presented in the Moon Camp Traffic Impact Analysis (TIA) conducted by Urban Crossroads (2007), study area intersections are projected to operate at a Level of Service “C” or better during peak hours with the improvements listed. According to Section 4.7.2 of the CO Protocol, if the project does not involve any intersections with an LOS “E” or “F”, no further analysis is necessary.

Level of Significance before Mitigation

Less than Significant.

4.2.2 - Residential Woodburning

Wood stoves and fireplaces are reasonably common in the area surrounding Big Bear Lake. Some people use wood as a primary source of heat, and others have wood stoves as a back-up in case of emergencies, such as power failures. Wood heating is also popular for cultural reasons when one considers that it can be beneficial because wood is a renewable fuel. However, the smoke from wood stoves and fireplaces pollutes the air outdoors. Smoke from outside can seep into buildings, including nearby homes, also affecting indoor air quality. Smoke from neighborhood stoves and fireplaces, a common source of both odor and reduced visibility, greatly contributes to the air pollution problems people complain about most.

Complete combustion gives off light, heat, and the gases carbon dioxide and water vapor. Because when wood burns, complete combustion does not occur, it also produces wood smoke, which contains CO, NO_X, and ROG. The ROG from woodburning includes toxic and/or cancer-causing substances, such as benzene, formaldehyde and benzo-a-pyrene, a polycyclic aromatic hydrocarbon (PAH).

Most wood heaters, such as woodstoves and fireplaces, release far more air pollution, indoors and out, than heaters using other fuels. In winter, when we heat our homes the most, cold nights with little wind cause smoke and air pollutants to remain stagnate at ground level for long periods. Even though there is no shorter averaging time for particulate matter air quality standards, there is a still a potential for nuisance violations in the area.

Level of Significance before Mitigation

Potentially Significant

Conventional factory-built fireplaces are not efficient at producing heat. These fireplaces are also the source of smoke, indoors and out. To reduce the nuisance risks of smoke – indoor and outside, while still allowing homeowners the ambiance, an EPA-certified fireplace insert is suggested. Additionally, wood heat can be supplied with various EPA-certified wood stoves, pellet stoves, or natural gas heaters. While older uncertified stoves and fireplaces release 40 to 60 grams of smoke per hour, new EPA-certified stoves produce only 2 to 5 grams of smoke per hour.

CARB explains that (CARB 2007) the heating efficiency of any wood heater depends on combining two factors: 1) how completely it burns the firewood (combustion efficiency), and 2) how much of the fire's heat gets into the room, rather than going up the flue (transfer efficiency). The measured heat efficiency of an open-hearth fireplace can range from -10 percent to 10 percent. The heating efficiency of an EPA-certified stove, insert, or fireplace can range from 60 percent to 80 percent.

CARB recommends (CARB 2007) that the owner to get into the habit of glancing out at their chimney top every so often. Apart from the half hour after lighting and refueling, a properly burning fire should give off only a thin wisp of white steam. If they see smoke, they should adjust the

dampers or air inlets to let in more air. The darker the smoke, the more pollutants it contains and the more fuel is being wasted.

Homeowners choosing to use fireplaces and woodstoves need to understand that healthy outdoor and indoor air quality requires good wood burning habits. Most fireplaces will rob the house of heat because they draw air from the room and send it up the chimney. Occupants are warmed if they sit within six feet of the fire, but the rest of the house gets colder as outdoor air leaks in to replace the hot air going up the chimney. The key to burning clean and hot is to control the airflow. Most fireplaces waste wood because of unrestricted airflow. A lot of air helps the fire burn fast, but a load of wood will last only one or two hours.

AQ-3 To reduce the emissions from woodburning apparatus; the following requirement will be placed on all new residences constructed on the proposed project's lots:

- No open-hearth fireplace will be allowed in new construction, only EPA Phase II Certified fireplaces and wood stoves, pellet stoves, and natural gas fireplaces shall be allowed.

AQ-4 To establish a "Good Neighbor Policy for Burning" that will further help reduce the potential for localized nuisance complaints related to woodburning; the proponent shall distribute an informational flyer to each purchaser of lots. At a minimum, the flyer will say:

- Know When To Burn
  - Monitor all fires; never leave a fire unattended.
  - Upgrade an older woodstove to one with a catalytic combustor that burns off excess pollutants.
  - Be courteous when visitors come to your home. Wood smoke can cause problems for people with developing or sensitive lungs (i.e. children, the elderly) and people with lung disease.

- Know What To Burn
  - Split large pieces of wood into smaller pieces and make sure it has been seasoned (allowed to dry for a year). Burning fresh cut logs = smoky fires.
  - When buying wood from a dealer, do not assume it has been seasoned.
  - Small hot fires are more efficient and less wasteful than large fires.
  - Never burn chemically treated wood or non-wood materials.

- Manufactured firelogs provide a nice ambience, have the least impact to air quality, and are a good choice for homeowners who use a fireplace infrequently.

- Know How To Burn
  - Proper combustion is key. Make sure your wood fire is not starved; if excess smoke is coming from the chimney or stack, the fire isn't getting enough air.
  - Visually check your chimney or stack 10 to 15 minutes after you light a fire to ensure it is not emitting excess amounts of smoke.
  - Homeowners should have woodstoves and fireplaces serviced and cleaned yearly to ensure they are working properly.

Level of Significance after Mitigation

Less than Significant

4.3 - Contribution to Climate Change

The threshold of significance proposed in this document is not simply if the Project would result in an increase in GHG emissions, but if the Project would result in an increase in GHGs that would significantly hinder or delay the State's ability to meet the reduction targets contained in AB 32.

This analysis contains two components. One component contains the Project's GHG emission estimates. The emissions estimate describes the sources of emissions, the emissions without incorporation of mitigation measures, and the emissions after the incorporation of mitigation measures, if required. The second component contains the measures used to compare the Project's components to the applicable State and local strategies and known mitigation measures to reduce GHGs.

This analysis is structured with the unmitigated emissions estimates provided before the State and local strategies.

4.3.1 - Emissions Inventory

Emissions Estimation Assumptions

Construction. The Project would emit GHGs during construction of the Project from combustion of fuels in worker vehicles accessing the site as well as from the construction equipment. The Project would also emit GHGs during the manufacture and transportation of the cement and building materials. However, emissions resulting from materials consumption will not be incorporated into the Project's emissions estimates. CEQA does not require a 'lifecycle' analysis approach to determine significance of potential environmental impacts.

Exhaust emissions during construction for the Project were estimated using URBEMIS2007 version 9.2.4 (URBEMIS 2007). The detailed calculations are provided in Appendix C.

Operation. Greenhouse gas emissions from area emissions and motor vehicles were generated using URBEMIS 2007. Emissions of nitrous oxide and methane emissions from natural gas consumption were estimated using emission factors as described in the attached spreadsheets in Appendix B.

Electricity usage for commercial operations was estimated using emission factors as described in the attached spreadsheets in Appendix B. The California Climate Action Registry (CCAR) emission factors for electricity use are 804.54 pounds of CO_2 per MWh, 0.0067 pounds of NH4 per MWh, and 0.0037 pounds of N_2O per MWh.

Note that emissions models such as EMFAC and URBEMIS evaluate aggregate emissions and do not demonstrate, with respect to a global impact, how much of these emissions are "new" emissions specifically attributable to the proposed project. For most projects, the main contribution of GHG emissions is from motor vehicles, but how much of those emissions are "new" is uncertain.

Inventory

The emissions are estimated in tons per year, which are converted to metric tons of carbon dioxide equivalents ($MTCO_2e$). The carbon dioxide emissions from construction activity are shown in Table 11. The GHG emissions from operation of the project are shown in Table 12. At buildout, the project will emit approximately 1,591.60 $MTCO_2e$ per year. Approximately 82 percent of operational GHGs will be generated by vehicular activity associated with the project. Natural gas use and indirect emissions from electricity generation will contribute approximately 11 percent and 6 percent of the operational GHG inventory, respectively.

Table 11: Construction Generated Carbon Dioxide Emissions

Source	Total Tons	MTCO2e
Project Construction	401.22	363.99

Table 12: Operational Greenhouse Gas Emissions

Source	Tons			Metric Tons CO_2e
	Carbon Dioxide	Nitrous Oxide	Methane	
Motor Vehicles	1,378.00	0.18	0.39	1,309.49
Natural Gas	189.75	0.00	0.02	172.67
Indirect Electricity	113.17	0.00	0.00	102.83
Hearth	6.63	-	-	6.01

Table 12: Operational Greenhouse Gas Emissions (Cont.)

Source	Tons			Metric Tons CO_2e
	Carbon Dioxide	Nitrous Oxide	Methane	
Landscape Equipment	0.65	-	-	0.59
Total	**1,688.20**	**0.19**	**0.41**	**1,591.60**
Source: Michael Brandman Associates, 2008				

4.3.2 - Applicable State and Local Strategies

Under AB 32, the CARB has the primary responsibility for reducing GHG emissions. However, the many public agencies involved in land use decisions, energy use, waste streams, construction, and other areas are also involved in the creation and implementation of strategies to reduce GHG emissions in California. The CAT addresses strategies for certain California public agencies. In addition, the California Attorney General's office has been active in advising public agencies on reducing GHG emissions. Therefore, this analysis will focus on the Project's early implementation of applicable state strategies. State strategies include measures in the 2006 CAT Report and the CARB's Early Action Measures. In addition, this analysis will focus on the Project's implementation of the applicable California Attorney General's Office suggested mitigation strategies for reducing GHG emissions. To assess significance, the following documents were used.

- The 2006 Climate Action Team Report to Governor Schwarzenegger (CAT 2006).
- ARB's Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California (ARB 2007).
- California Attorney General's Office Mitigation Letter (AG 2008).

2006 CAT Report

A discussion on the background of the 2006 CAT Report is in the Regulatory Framework section. The 2006 CAT Report to Governor Schwarzenegger and the Legislature contains existing bills, regulations, and standards that help reduce California's GHG emissions. The 2006 CAT Report also contains new strategies that can be implemented by the CARB and other California agencies to help reduce California's emissions to 1990 levels in 2020. The 2006 CAT Report lists the recommendation for emission reduction strategies to be implemented in the "next two years" for the public agencies involved in the CAT. As an example, the 2006 CAT Report contains the following possible measure: the CARB could ban the retail sale of hydroflourocarbons in small cans. It is important to understand that compliance with all applicable state standards and regulations is a requirement. As such, this Project will comply with all applicable laws and standards as they are adopted.

Although the 2006 CAT Report applies to adoption of strategies by public agencies, this project can contribute to early implementation of applicable strategies by incorporating as design features or mitigation measures that help achieve the goals of the reduction strategies. An assessment of project's early implementation of applicable and feasible 2006 CAT Report strategies is contained in Table 3.2 14.

Table 13: 2006 CAT Report Strategies

Applicable and Feasible Strategy	Incorporated into Project?
Achieve 50 percent Statewide Recycling Goal: Achieving the State's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48 percent has been achieved on a statewide basis. Therefore, a 2 percent additional reduction is needed.	No
Afforestation/Reforestation Projects: Reforestation projects focus on restoring native tree cover on lands that were previously forested and are now covered with other vegetative types.	No
Water Use Efficiency: Approximately 19 percent of all electricity, 30 percent of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions.	No
Building Energy Efficiency Standards in Place and in Progress: Public Resources Code 25402 authorizes the CEC to adopt and periodically update its building energy efficiency standards (that apply to newly constructed buildings and additions to and alterations to existing buildings).	No
Appliance Energy Efficiency Standards in Place and in Progress: Public Resources Code 25402 authorizes the Energy Commission to adopt and periodically update its appliance energy efficiency standards (that apply to devices and equipment using energy that are sold or offered for sale in California).	No
Green Buildings Initiative: Green Building Executive Order, S-20-04 (CA 2004), sets a goal of reducing energy use in public and private buildings by 20 percent by the year 2015, as compared with 2003 levels.	No
California Solar Initiative: Installation of 1 million solar roofs or an equivalent 3,000 MW by 2017 on homes and businesses; increased use of solar thermal systems to offset the increasing demand for natural gas; use of advanced metering in solar applications; and creation of a funding source that can provide rebates over 10 years through a declining incentive schedule.	No

As shown in Table 13, there are seven measures that are applicable and feasible for the project. Currently, the project does not contain design features or programs that contribute to early implementation of these measures.

ARB Early Action Measures

The CARB published its Expanded Early Actions to Mitigate Climate Change in California, which describes recommendations for discrete early action measures to reduce GHG emissions. A review of the CARB's reduction measures underway or to be initiated by the CARB in the 2007 to 2012 timeframe indicates that only one measure would be applicable to the project. This measure is the "Cool Communities Program," which is anticipated to have a CARB hearing date in the third quarter of 2008. This program is recommended to be a non-regulatory voluntary program with guidelines to foster the establishment or transition to cool communities in California. The following is a brief description of the strategies to be adopted in the Cool Communities Program guidelines:

- Cool Roofs. Cool roof programs as part of the Building Energy Efficiency standards (Title 24) can save as much as 15 percent of cooling energy use during hot months of the year. The per-house cost premium is estimated at about $500.
- Cool Pavements. Cool pavements can reduce the ambient air temperature by 1 degree Fahrenheit, thereby reducing energy cooling demand.
- Shade Trees and Urban Forest. The Tree Benefit Estimator reports that a mature tree system would save about 700 kWh of energy (1,100 kg of CO_2 per household).

If the project were to take part in the voluntary early action strategies, it would be consistent with the strategies. However, as the project is currently designed, it does not implement the Cool Communities Program.

Attorney General Mitigation

The Office of the California Attorney General maintains a list of CEQA Mitigations for Global Warming Impacts on its website. The Attorney General's Office has listed some examples of types of mitigations that local agencies may consider to offset or reduce global warming impacts from a project. The Attorney General's Office states that the presented lists are examples and not intended to be exhaustive but are instead provided as measures and policies that could be undertaken. Moreover, the measures cited may not be appropriate for every project, so the Attorney General suggests that the lead agency should use its own informed judgment in deciding which measures it would analyze, and which measures it would require, for a given project. The mitigation measures are divided into two groups—generally applicable measures and general plan measures. As this Project does not involve the development of a general plan, only the generally applicable measures were reviewed.

The Attorney General presents 'generally applicable' measures in the following areas:

- Energy efficiency;
- Renewable energy;
- Water conservation and efficiency;
- Solid waste measures;

- Land use measures;
- Transportation and motor vehicles; and
- Carbon offsets.

The project does preserve open space and existing trees (Land Use Measures). However, the size of the project, rural nature of the development, and distance to public transportation make some Land Use and Transportation measures infeasible, such as incorporating public transit into the project design. The project could, but does not currently, incorporate measures to increase energy efficiency, use of renewable energy, water conservation and efficiency, and reduce solid waste.

4.3.3 - Conclusion

The project will generate a limited amount of GHG generation during construction, and it will lead to a low-amount on-going operational emissions from the use of the 50 residential units. The project would emit less than 25 percent of the SCAQMD's draft numerical GHG threshold of significance (currently proposed as 6,500 $MTCO_2e$). Therefore, because of the size of the project, the project will not significantly hinder or delay California's ability to meet the reduction targets contained in AB 32.

It is possible to incorporate additional measures into the project to reduce the project's contribution of GHGs, thereby reducing the project's likelihood of hindering or delaying California's ability to meet the reduction targets contained in AB 32. However, as the project is less than significant, mitigation measures to further reduce this impact are not required. Measures that reduce the emissions generation motor vehicles, natural gas consumption, and electricity consumption would reduce the main operational sources of GHGs.

4.4 - Conformance with Air Quality Management Plan

The CEQA checklist indicates that a significant impact would occur if the proposed project would conflict with or obstruct implementation of the applicable air quality plan.

This assessment will use four criteria for determining project consistency with the current AQMP, as discussed below. The first and second criteria are from the SCAQMD. According to the SCAQMD, there are two key indicators of AQMP consistency: 1) whether the project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP; and 2) whether the project will exceed the assumptions in the AQMP based on the year of project build out and phase (SCAQMD 2006b). The third criterion is compliance with the control measures in the AQMP. The fourth criterion is compliance with the SCAQMD regional thresholds.

4.4.1 - Project's Contribution to Air Quality Violations

As shown above in Sections 4.1 - Short-Term Impacts and 4.2 - Long-Term Impacts, the project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, the project meets the first indicator.

4.4.2 - AQMP Assumptions

One way to assess project compliance with the AQMP assumptions is to ensure that the population density and land use are consistent with the growth assumptions used in the air plans for the air basin. According to CARB transportation performance standards, the rate of growth in vehicle miles traveled (VMT) and trips should be held to the rate of population growth (SCAQMD 2006b). Compliance with this performance standard is one way suggested by CARB of showing compliance with the growth assumptions used in the AQMP. If the total VMT generated by the proposed project at build-out is at or below that predicted by the AQMP, then the proposed project's mobile emissions is consistent with the AQMP. It is assumed that the existing and future pollutant emissions computed in the AQMP were based on land uses from area general plans.

As the project site is currently zoned, only one lot would be allowed on the 62.43 acres. The Proposed Project will allow 50 lots in the same area. This would result in a net increase of 487 trips per day over what is in the current general plan expected growth. The TIA provided an estimation of daily traffic generated by projects planned in the area in 2030. The results indicate that the other development's trip generation would be 15,111 in 2030. The proposed project's traffic generation in 2030 would be 497 for a total of 15,608 total trips including the Project. This represents just over 3 percent of the projected cumulative growth. Whereas the increase above the parcel alone will be considerable, the relative increase above the vicinity general plan projection is minimal. Therefore, the project is consistent with the assumptions in the AQMP.

4.4.3 - Control Measures

The third criterion is compliance with the control measures in the AQMP. The AQMP contains a number of land use and transportation control measures including the following: the District's Stationary and Mobile Source Control Measures; State Control Measures proposed by CARB; and Transportation Control Measures provided by SCAG (AQMP 2003). CARB's strategy for reducing mobile source emissions include the following approaches: new engine standards; reduce emissions from in-use fleet, require clean fuels, support alternative fuels and reduce petroleum dependency, work with EPA to reduce emissions from national and state sources, and pursue long-term advanced technology measures (AQMP 2003). Transportation control measures provided by SCAG include those contained in the Regional Transportation Plans (RTP), the most current version being the 2004 RTP. The RTP has control measures to reduce emissions from on-road sources by incorporating strategies such as high occupancy vehicle interventions, transit, and information-based technology interventions (AQMP 2003). The measures implemented by CARB and SCAG effect the project

indirectly by regulating the vehicles that the residents may use and regulating public transportation. The project indirectly will comply with the control measures set by CARB and SCAG.

The project will comply with all of the District's applicable rules and regulations. Therefore, the project complies with this criterion.

4.4.4 - Compliance with the SCAQMD Regional Thresholds

Although there is no known guidance that correlates AQMP consistency with the SCAQMD regional thresholds, it is common to use the thresholds in assessing AQMP compliance.

The regional significance analysis of construction and operational emissions demonstrated that emissions would not exceed the SCAQMD regional significance thresholds. Therefore, the project is consistent with the SCAQMD regional thresholds.

Level of Significance before Mitigation

Less than Significant

4.5 - Potential for Air Quality Standard Violation

The CEQA guidelines indicate that a significant impact would occur if the proposed project would violate any air quality standard or contribute substantially to an existing or projected air quality violation.

The South Coast Air Basin, the geographical area in which the project is located, is in nonattainment for CO, PM_{10}, $PM_{2.5}$, and ozone. Levels of PM_{10} and $PM_{2.5}$ are locally high enough that contributions from new sources may add to the concentrations of those pollutants and contribute to a projected air quality violation. Although background levels of ozone are high in the basin, the project alone (without other cumulative sources) would not contribute substantially to a projected air quality violation of ozone. Project emissions of VOC and NO_X (ozone precursors) and their cumulative contribution to ozone concentrations are discussed in Cumulative Impacts below.

Although CO is still listed as a nonattainment pollutant, the basin has not exceeded the CO standard for the past several years. Additionally, as shown in Table 2, the project's source receptor area has not violated the CO standard for the past several years.

Two criteria are used to assess the significance of this impact: 1) the localized construction analysis; and 2) the CO hotspot analysis. These analyses are discussed above and have concluded that they would result in a less than significant impact.

Particulate matter emissions during operation (PM_{10} and $PM_{2.5}$) are primarily from paved road dust and fireplaces. It is not likely that the project would generate enough road dust during operation to violate a PM_{10} or $PM_{2.5}$. Also, it is not likely that particulate matter emissions from woodburning

devices in an entire day would be enough to violate the 24-hour standards for either PM_{10} or $PM_{2.5}$. In addition, the regional significance analysis demonstrated that emissions of PM_{10} and $PM_{2.5}$ are below the regional significance thresholds.

Sulfur dioxide emissions from the project are negligible. The regional analysis demonstrated that emissions are far under the regional significance threshold. Therefore, it follows that on a localized basis, emissions of sulfur dioxide would not exceed the ambient air quality standards. In addition, the basin is in attainment for sulfur dioxide and does not experience high pollutant episodes of that pollutant. Therefore, potential impacts of sulfur dioxide are less than significant.

Level of Significance before Mitigation

Less than Significant

4.6 - Cumulative Impacts

Section 15130(b) of the CEQA Guidelines states the following:

> The following elements are necessary to an adequate discussion of significant cumulative impacts, either:
>
> - A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or
> - A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document, which has been adopted or certified, which described or evaluated regional or areawide conditions contributing to the cumulative impact.

In accordance with CEQA Guidelines 15130(b), this analysis of cumulative impacts incorporates a summary of projections. The following four-tiered approach is to assess cumulative air quality impacts.

- Consistency with the SCAQMD project specific thresholds for construction and operation;
- Project consistency with existing air quality plans; and
- Assessment of the cumulative health effects of the pollutants;

4.6.1 - Project Specific Thresholds

After implementation of mitigation measures, during construction, emissions of VOC, NO_X, PM_{10}, and $PM_{2.5}$ is not expected to exceed the SCAQMD regional significance thresholds. In addition, during operation, the proposed project is not expected to exceed the established regional emission thresholds for VOC, NO_X, CO, PM_{10}, and $PM_{2.5}$. The SCAQMD considers construction or

operational emissions that do not exceed the project specific thresholds will not result in a cumulative impact.

Level of Significance before Mitigation

Less than Significant

4.6.2 - Air Quality Plans

The South Coast Air Basin, in which the project is located, is in nonattainment for ozone, PM_{10}, $PM_{2.5}$, and CO. As such, the SCAQMD is required to prepare and maintain an AQMP and a SIP to document the strategies and measures to be undertaken to reach attainment of ambient air quality standards. While the SCAQMD does not have direct authority over land use decisions, it was recognized that changes in land use and circulation planning were necessary to maintain clean air. As discussed above in Section 4.4 - Conformance with Air Quality Management Plan, the project is compliant with the AQMP.

Level of Significance before Mitigation

Less than Significant

4.6.3 - Cumulative Health Impacts

The basin is in nonattainment for ozone, PM_{10}, $PM_{2.5}$, and CO, which means that the background levels of those pollutants are at times higher than the ambient air quality standards. The air quality standards were set to protect the health of sensitive individuals (i.e., elderly, children, and the sick). Therefore, when the concentration of those pollutants exceed the standard, it is likely that some of the sensitive individuals of the population experience health effects as described above in Section 2.2 - Pollutants

The localized significance analysis in Section 4.1 - Short-Term Impacts demonstrated that during construction activities, no localized significance threshold was expected to be exceeded; therefore, the emissions of particulate matter, primarily in the form of fugitive dust, would not result in a significant cumulative health impact.

Long-term operational emissions are not expected to exceed the District's significance thresholds. ROG and NO_X are precursors to ozone. Because ozone is a secondary pollutant (it is not emitted directly but formed by chemical reactions in the air), it can be formed miles downwind of the project site. Project emissions of VOC and NO_X may still contribute to the background concentration of ozone but such contributions would not be considered cumulatively considerable.

Operational emissions of PM_{10} and $PM_{2.5}$ are not expected to exceed the regional significance threshold. The combination of ozone and PM_{10} can aggravate health effects. $PM_{2.5}$ is a component of PM_{10}. The ambient air quality standard for both PM_{10} and $PM_{2.5}$ are exceeded in the Basin.

Therefore, project emissions may contribute to the background of those pollutants but such contributions would not be considered cumulatively considerable.

Long-term health effects from residential woodburning are not expected create a significant impact. Implementation of Mitigation Measures AQ-3 and AQ-4 will create the environment where woodburning activities may contribute to the local wood smoke but such contribution would not be considered cumulatively considerable.

Level of Significance before Mitigation

Less than Significance

4.7 - Expose Sensitive Receptors to Substantial Pollutant Concentrations

The CEQA guidelines indicate that a significant impact would occur if the proposed project would expose sensitive receptors to substantial pollutant concentrations.

The localized construction analysis demonstrated that without mitigation, the project would not exceed the localized thresholds for CO, NO_2, PM_{10}, or $PM_{2.5}$. Therefore, during construction, the project would not expose sensitive receptors to substantial pollutant concentrations of CO, NO_2, PM_{10}, or $PM_{2.5}$.

The construction equipment would emit diesel particulate matter, which is a carcinogen. However, the diesel particulate matter emissions are short term in nature. Determination of risk from diesel particulate matter is considered over a 70-year exposure time. Therefore, considering the dispersion of the emissions and the short time frame, exposure to diesel particulate matter is anticipated to be less than significant.

During operation of the project, a CO hotspot analysis is the appropriate tool to determine if project emissions of CO during operation would exceed ambient air quality standards. The main source of air pollutant emissions during operation are from offsite motor vehicles traveling on the roads surrounding the project. The study area intersections were projected to operate at a Level of Service "C" or better during peak hours with the improvements listed in the TIA. According to Section 4.7.2 of the CO Protocol, if the project does not involve any intersections with an LOS "E" or "F", no further analysis is necessary. Therefore, according to this criterion, air pollutant emissions during operation would result in a less than significant impact.

During operation of the project, the addition of woodburning devices to the area would potentially expose sensitive receptors to localized concentrations of criteria and toxic pollutants. With the incorporation of mitigations, the project would not expose sensitive receptors to substantial pollutant concentrations.

Level of Significance before Mitigation

Less than Significant

4.8 - Odors

The CEQA guidelines indicate that a significant impact would occur if the proposed project would create objectionable odors affecting a substantial number of people.

The proposed project does not contain land uses typically associated with emitting objectionable odors, with the possible exception of wood smoke. Wood smoke is pleasant to some and may be a nuisance to others. Implementation and compliance with SCAQMD Rule 402 will ensure that wood smoke will not be offensive to a substantial number of people. Diesel exhaust and VOCs will be emitted during construction of the project, which are objectionable to some; however, emissions will disperse rapidly from the project site and therefore should not be at a level to induce a negative response.

Level of Significance before Mitigation

Less than Significant

SECTION 5: REFERENCES

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Appendix A:
URBEMIS Output

URBEMIS 2002 For Windows 8.7.0

File Name: E:\URBEMIS\Moon Camp\Moon Camp 2007.urb
Project Name: Moon Camp 2007
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	69.31	53.38	68.71	0.00	43.51	1.91	41.60
TOTALS (lbs/day, mitigated)	69.31	42.76	68.71	0.00	6.59	0.38	6.21

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.45	0.63	2.01	0.02	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	3.48	6.06	43.49	0.03	4.86

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	7.92	6.70	45.50	0.04	4.87

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	69.31	53.38	68.71	0.00	43.51	1.91	41.60
TOTALS (lbs/day, mitigated)	69.31	42.76	68.71	0.00	6.59	0.38	6.21

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	32.58	1.61	52.18	0.12	7.74

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	4.23	7.23	52.66	0.03	4.86

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	36.81	8.84	104.83	0.15	12.60

DETAIL REPORT
(Pounds/Day - Winter)

Construction Start Month and Year: January, 2008
Construction Duration: 12
Total Land Use Area to be Developed: 16.67 acres
Maximum Acreage Disturbed Per Day: 4.16 acres
Single Family Units: 50 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source *** 2008***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	41.60	-	41.60
Off-Road Diesel	8.03	49.74	67.35	-	1.81	1.81	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.06	0.13	1.36	0.00	0.00	0.00	0.00
Maximum lbs/day	8.09	49.87	68.71	0.00	43.41	1.81	41.60
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	4.15	30.14	31.84	-	1.29	1.29	0.00
Bldg Const Worker Trips	0.20	0.12	2.62	0.00	0.04	0.00	0.04
Arch Coatings Off-Gas	60.45	-	-	-	-	-	-
Arch Coatings Worker Trips	0.20	0.12	2.62	0.00	0.04	0.00	0.04
Asphalt Off-Gas	0.60	-	-	-	-	-	-
Asphalt Off-Road Diesel	3.58	20.75	30.41	-	0.57	0.57	0.00
Asphalt On-Road Diesel	0.12	2.23	0.42	0.00	0.05	0.05	0.00
Asphalt Worker Trips	0.02	0.01	0.29	0.00	0.00	0.00	0.00
Maximum lbs/day	69.31	53.38	68.21	0.00	2.00	1.91	0.09
Max lbs/day all phases	69.31	53.38	68.71	0.00	43.51	1.91	41.60

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '08
Phase 2 Duration: 1.3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Crawler Tractors	143	0.575	8.0
1	Graders	174	0.575	8.0
1	Off Highway Trucks	417	0.490	8.0
1	Rubber Tired Loaders	165	0.465	8.0
1	Scrapers	313	0.660	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '08
Phase 3 Duration: 10.7 months
Start Month/Year for SubPhase Building: Feb '08
SubPhase Building Duration: 10.7 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Other Equipment	190	0.620	8.0

Start Month/Year for SubPhase Architectural Coatings: Nov '08
SubPhase Architectural Coatings Duration: 1.1 months
Start Month/Year for SubPhase Asphalt: Dec '08
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 2.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Pavers	132	0.590	8.0
2	Rollers	114	0.430	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source *** 2008***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	6.21	-	6.21
Off-Road Diesel	8.03	39.79	67.35	-	0.36	0.36	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.06	0.13	1.36	0.00	0.00	0.00	0.00
Maximum lbs/day	8.09	39.92	68.71	0.00	6.57	0.36	6.21
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	4.15	24.11	31.84	-	0.26	0.26	0.00
Bldg Const Worker Trips	0.20	0.12	2.62	0.00	0.04	0.00	0.04
Arch Coatings Off-Gas	60.45	-	-	-	-	-	-
Arch Coatings Worker Trips	0.20	0.12	2.62	0.00	0.04	0.00	0.04
Asphalt Off-Gas	0.60	-	-	-	-	-	-
Asphalt Off-Road Diesel	3.58	16.60	30.41	-	0.11	0.11	0.00
Asphalt On-Road Diesel	0.12	1.78	0.42	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.02	0.01	0.29	0.00	0.00	0.00	0.00
Maximum lbs/day	69.31	42.76	68.21	0.00	0.47	0.38	0.09
Max lbs/day all phases	69.31	42.76	68.71	0.00	6.59	0.38	6.21

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Apply soil stabilizers to inactive areas
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Off-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 2: Off-Road Diesel Exhaust: Use diesel oxidation catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 2: On-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 2: On-Road Diesel Exhaust: Use diesel oxidation catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
Phase 3: Off-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 3: Off-Road Diesel Exhaust: Use diesel oxidation catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 3: Off-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 3: Off-Road Diesel Exhaust: Use diesel oxidation catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 3: On-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 3: On-Road Diesel Exhaust: Use diesel oxidation catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '08

Phase 2 Duration: 1.3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Crawler Tractors	143	0.575	8.0
1	Graders	174	0.575	8.0
1	Off Highway Trucks	417	0.490	8.0
1	Rubber Tired Loaders	165	0.465	8.0
1	Scrapers	313	0.660	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '08
Phase 3 Duration: 10.7 months
Start Month/Year for SubPhase Building: Feb '08
SubPhase Building Duration: 10.7 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Other Equipment	190	0.620	8.0

Start Month/Year for SubPhase Architectural Coatings: Nov '08
SubPhase Architectural Coatings Duration: 1.1 months
Start Month/Year for SubPhase Asphalt: Dec '08
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 2.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Pavers	132	0.590	8.0
2	Rollers	114	0.430	8.0

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.05	0.63	0.27	0	0.00
Hearth	28.38	0.98	51.91	0.12	7.74
Landscaping - No winter emissions					
Consumer Prdcts	2.45	-	-	-	-
Architectural Coatings	1.70	-	-	-	-
TOTALS(lbs/day,unmitigated)	32.58	1.61	52.18	0.12	7.74

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	4.23	7.23	52.66	0.03	4.86
TOTAL EMISSIONS (lbs/day)	4.23	7.23	52.66	0.03	4.86

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2008 Temperature (F): 40 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Single family housing	62.43	9.57 trips/dwelling unit	50.00	478.50
		Sum of Total Trips		478.50
		Total Vehicle Miles Traveled		3,201.40

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.00	1.60	98.00	0.40
Light Truck < 3,750 lbs	15.00	2.70	95.30	2.00
Light Truck 3,751- 5,750	16.20	1.20	97.50	1.30
Med Truck 5,751- 8,500	7.20	1.40	95.80	2.80
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.70	76.50	23.50	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	8.30	83.30	8.40

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Single family housing
have changed from the defaults 9.57/16.67 to 9.57/62.43

Changes made to the default values for Construction

Architectural Coatings: # ROG/ft2 (residential) changed from 0.0185 to 0.00602
Architectural Coatings: # ROG/ft2 (non-res) changed from 0.0185 to 0.0116
Phase 2 mitigation measure Soil Disturbance: Apply soil stabilizers to inactive areas
has been changed from off to on.
Phase 2 mitigation measure Soil Disturbance: Replace ground cover in disturbed areas quickly
has been changed from off to on.
Phase 2 mitigation measure Soil Disturbance: Water exposed surfaces - 2x daily
has been changed from off to on.
Phase 2 mitigation measure Off-Road Diesel Exhaust: Use diesel particulate filter
has been changed from off to on.
Phase 2 mitigation measure Off-Road Diesel Exhaust: Use diesel oxidation catalyst
has been changed from off to on.
Phase 2 mitigation measure On-Road Diesel Exhaust: Use diesel particulate filter
has been changed from off to on.
Phase 2 mitigation measure On-Road Diesel Exhaust: Use diesel oxidation catalyst
has been changed from off to on.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.
Phase 3 mitigation measure Off-Road Diesel Exhaust: Use diesel particulate filter
has been changed from off to on.
Phase 3 mitigation measure Off-Road Diesel Exhaust: Use diesel oxidation catalyst
has been changed from off to on.
Phase 3 mitigation measure Off-Road Diesel Exhaust: Use diesel particulate filter
has been changed from off to on.
Phase 3 mitigation measure Off-Road Diesel Exhaust: Use diesel oxidation catalyst
has been changed from off to on.
Phase 3 mitigation measure On-Road Diesel Exhaust: Use diesel particulate filter
has been changed from off to on.
Phase 3 mitigation measure On-Road Diesel Exhaust: Use diesel oxidation catalyst
has been changed from off to on.

Changes made to the default values for Area

The landscape year changed from 2005 to 2007.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2008.
The operational winter temperature changed from 50 to 40.
The operational winter selection item changed from 3 to 1.
The operational summer temperature changed from 90 to 60.
The operational summer selection item changed from 8 to 3.

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: January, 2008
Construction Duration: 12
Total Land Use Area to be Developed: 16.67 acres
Maximum Acreage Disturbed Per Day: 4.16 acres
Single Family Units: 50 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source *** 2008***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	41.60	-	41.60
Off-Road Diesel	8.03	49.74	67.35	-	1.81	1.81	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.06	0.13	1.36	0.00	0.00	0.00	0.00
Maximum lbs/day	8.09	49.87	68.71	0.00	43.41	1.81	41.60
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	4.15	30.14	31.84	-	1.29	1.29	0.00
Bldg Const Worker Trips	0.20	0.12	2.62	0.00	0.04	0.00	0.04
Arch Coatings Off-Gas	60.45	-	-	-	-	-	-
Arch Coatings Worker Trips	0.20	0.12	2.62	0.00	0.04	0.00	0.04
Asphalt Off-Gas	0.60	-	-	-	-	-	-
Asphalt Off-Road Diesel	3.58	20.75	30.41	-	0.57	0.57	0.00
Asphalt On-Road Diesel	0.12	2.23	0.42	0.00	0.05	0.05	0.00
Asphalt Worker Trips	0.02	0.01	0.29	0.00	0.00	0.00	0.00
Maximum lbs/day	69.31	53.38	68.21	0.00	2.00	1.91	0.09
Max lbs/day all phases	69.31	53.38	68.71	0.00	43.51	1.91	41.60

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '08
Phase 2 Duration: 1.3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Crawler Tractors	143	0.575	8.0
1	Graders	174	0.575	8.0
1	Off Highway Trucks	417	0.490	8.0
1	Rubber Tired Loaders	165	0.465	8.0
1	Scrapers	313	0.660	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '08
Phase 3 Duration: 10.7 months
  Start Month/Year for SubPhase Building: Feb '08
  SubPhase Building Duration: 10.7 months
  Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Other Equipment	190	0.620	8.0

  Start Month/Year for SubPhase Architectural Coatings: Nov '08
  SubPhase Architectural Coatings Duration: 1.1 months
  Start Month/Year for SubPhase Asphalt: Dec '08
  SubPhase Asphalt Duration: 0.5 months
  Acres to be Paved: 2.5
  Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Pavers	132	0.590	8.0
2	Rollers	114	0.430	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	6.21	-	6.21
Off-Road Diesel	8.03	39.79	67.35	-	0.36	0.36	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.06	0.13	1.36	0.00	0.00	0.00	0.00
Maximum lbs/day	8.09	39.92	68.71	0.00	6.57	0.36	6.21
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	4.15	24.11	31.84	-	0.26	0.26	0.00
Bldg Const Worker Trips	0.20	0.12	2.62	0.00	0.04	0.00	0.04
Arch Coatings Off-Gas	60.45	-	-	-	-	-	-
Arch Coatings Worker Trips	0.20	0.12	2.62	0.00	0.04	0.00	0.04
Asphalt Off-Gas	0.60	-	-	-	-	-	-
Asphalt Off-Road Diesel	3.58	16.60	30.41	-	0.11	0.11	0.00
Asphalt On-Road Diesel	0.12	1.78	0.42	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.02	0.01	0.29	0.00	0.00	0.00	0.00
Maximum lbs/day	69.31	42.76	68.21	0.00	0.47	0.38	0.09
Max lbs/day all phases	69.31	42.76	68.71	0.00	6.59	0.38	6.21

Construction-Related Mitigation Measures

Phase 2: Soil Disturbance: Apply soil stabilizers to inactive areas
  Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
  Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
  Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Off-Road Diesel Exhaust: Use diesel particulate filter
  Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 2: Off-Road Diesel Exhaust: Use diesel oxidation catalyst
  Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 2: On-Road Diesel Exhaust: Use diesel particulate filter
  Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 2: On-Road Diesel Exhaust: Use diesel oxidation catalyst
  Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
  Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)

Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
Phase 3: Off-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 3: Off-Road Diesel Exhaust: Use diesel oxidation catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 3: Off-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 3: Off-Road Diesel Exhaust: Use diesel oxidation catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 3: On-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 3: On-Road Diesel Exhaust: Use diesel oxidation catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Jan '08
Phase 2 Duration: 1.3 months
On-Road Truck Travel (VMT): 0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Crawler Tractors	143	0.575	8.0
1	Graders	174	0.575	8.0
1	Off Highway Trucks	417	0.490	8.0
1	Rubber Tired Loaders	165	0.465	8.0
1	Scrapers	313	0.660	8.0
1	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Feb '08
Phase 3 Duration: 10.7 months
Start Month/Year for SubPhase Building: Feb '08
SubPhase Building Duration: 10.7 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Other Equipment	190	0.620	8.0

Start Month/Year for SubPhase Architectural Coatings: Nov '08
SubPhase Architectural Coatings Duration: 1.1 months
Start Month/Year for SubPhase Asphalt: Dec '08
SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 2.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
2	Pavers	132	0.590	8.0
2	Rollers	114	0.430	8.0

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.05	0.63	0.27	0	0.00
Hearth - No summer emissions					
Landscaping	0.25	0.01	1.74	0.02	0.01
Consumer Prdcts	2.45	-	-	-	-
Architectural Coatings	1.70	-	-	-	-
TOTALS(lbs/day,unmitigated)	4.45	0.63	2.01	0.02	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	3.48	6.06	43.49	0.03	4.86
TOTAL EMISSIONS (lbs/day)	3.48	6.06	43.49	0.03	4.86

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2008 Temperature (F): 60 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Single family housing	62.43	9.57 trips/dwelling unit	50.00	478.50
		Sum of Total Trips		478.50
		Total Vehicle Miles Traveled		3,201.40

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.00	1.60	98.00	0.40
Light Truck < 3,750 lbs	15.00	2.70	95.30	2.00
Light Truck 3,751- 5,750	16.20	1.20	97.50	1.30
Med Truck 5,751- 8,500	7.20	1.40	95.80	2.80
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.70	76.50	23.50	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	8.30	83.30	8.40

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Rural Trip Length (miles)	11.5	4.9	6.0	10.3	5.5	5.5
Trip Speeds (mph)	35.0	40.0	40.0	40.0	40.0	40.0
% of Trips - Residential	20.0	37.0	43.0			

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Single family housing
 have changed from the defaults 9.57/16.67 to 9.57/62.43

Changes made to the default values for Construction

Architectural Coatings: # ROG/ft2 (residential) changed from 0.0185 to 0.00602
Architectural Coatings: # ROG/ft2 (non-res) changed from 0.0185 to 0.0116
Phase 2 mitigation measure Soil Disturbance: Apply soil stabilizers to inactive areas
     has been changed from off to on.
Phase 2 mitigation measure Soil Disturbance: Replace ground cover in disturbed areas quickly
     has been changed from off to on.
Phase 2 mitigation measure Soil Disturbance: Water exposed surfaces - 2x daily
     has been changed from off to on.
Phase 2 mitigation measure Off-Road Diesel Exhaust: Use diesel particulate filter
     has been changed from off to on.
Phase 2 mitigation measure Off-Road Diesel Exhaust: Use diesel oxidation catalyst
     has been changed from off to on.
Phase 2 mitigation measure On-Road Diesel Exhaust: Use diesel particulate filter
     has been changed from off to on.
Phase 2 mitigation measure On-Road Diesel Exhaust: Use diesel oxidation catalyst
     has been changed from off to on.
Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
     has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily

has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
has been changed from off to on.
Phase 3 mitigation measure Off-Road Diesel Exhaust: Use diesel particulate filter
has been changed from off to on.
Phase 3 mitigation measure Off-Road Diesel Exhaust: Use diesel oxidation catalyst
has been changed from off to on.
Phase 3 mitigation measure Off-Road Diesel Exhaust: Use diesel particulate filter
has been changed from off to on.
Phase 3 mitigation measure Off-Road Diesel Exhaust: Use diesel oxidation catalyst
has been changed from off to on.
Phase 3 mitigation measure On-Road Diesel Exhaust: Use diesel particulate filter
has been changed from off to on.
Phase 3 mitigation measure On-Road Diesel Exhaust: Use diesel oxidation catalyst
has been changed from off to on.

Changes made to the default values for Area

The landscape year changed from 2005 to 2007.

Changes made to the default values for Operations

The operational emission year changed from 2005 to 2008.
The operational winter temperature changed from 50 to 40.
The operational winter selection item changed from 3 to 1.
The operational summer temperature changed from 90 to 60.
The operational summer selection item changed from 8 to 3.

Appendix B:
EMFAC Analysis of Technology Groups

2030 Summary

Veh Type	Veh Year	TGP (x1000)
	TOTAL LDA	***0.000***
	TOTAL LDT1	***0.000***
	TOTAL LDT2	***0.000***
	TOTAL MDV	***0.000***
	TOTAL VEHICLES	1,047,886.000
	TOTAL TG 1-7	0.000
	% OF TOTAL	**0.00%**

2007 Summary

Veh Type	Veh Year	TGP (x1000)	TotP (x1000)	% of TotP
LDA	1965	2,127.114	2,129.649	99.9%
LDA	1966	1,054.100	1,055.712	99.8%
LDA	1967	937.481	939.148	99.8%
LDA	1968	910.751	911.422	99.9%
LDA	1969	1,003.926	1,005.247	99.9%
LDA	1970	893.548	895.583	99.8%
LDA	1971	739.652	740.342	99.9%
LDA	1972	872.333	875.737	99.6%
LDA	1973	895.211	897.495	99.7%
LDA	1974	681.231	684.558	99.5%
LDA	1975	406.189	414.556	98.0%
LDA	1976	455.765	463.110	98.4%
LDA	1977	555.996	593.659	93.7%
LDA	1978	732.738	816.530	89.7%
LDA	1979	771.968	948.703	81.4%
LDA	1980	241.385	718.516	33.6%
LDA	1981	149.421	919.534	16.2%
LDA	1982	166.446	1,079.029	15.4%
LDA	1983	180.102	1,406.913	12.8%
LDA	1984	33.823	2,387.082	1.4%
	TOTAL LDA	***13,809.179***		
LDT1	1965	904.890	907.484	99.7%
LDT1	1966	222.413	223.192	99.7%
LDT1	1967	199.522	200.404	99.6%
LDT1	1968	273.651	275.200	99.4%
LDT1	1969	343.665	344.312	99.8%
LDT1	1970	364.708	365.372	99.8%
LDT1	1971	420.192	422.456	99.5%
LDT1	1972	604.163	604.164	100.0%
LDT1	1973	545.358	546.010	99.9%
LDT1	1974	166.056	168.243	98.7%
LDT1	1975	110.031	110.741	99.4%
LDT1	1976	115.987	116.717	99.4%
LDT1	1977	146.099	150.429	97.1%
LDT1	1978	180.474	189.669	95.2%
LDT1	1979	238.247	264.268	90.2%
LDT1	1980	147.882	179.066	82.6%
LDT1	1981	109.117	233.525	46.7%
LDT1	1982	71.595	248.413	28.8%
LDT1	1983	20.562	278.765	7.4%
LDT1	1984	60.277	523.409	11.5%
LDT1	1985	26.775	637.906	4.2%
LDT1	1986	25.913	877.323	3.0%
LDT1	1987	14.738	866.121	1.7%
	TOTAL LDT1	***5,312.315***		

2007 Summary

Veh Type	Veh Year	TGP (x1000)	TotP (x1000)	% of TotP
LDT2	1965	39.487	39.487	100.0%
LDT2	1966	133.292	134.152	99.4%
LDT2	1967	112.417	112.417	100.0%
LDT2	1968	146.344	146.344	100.0%
LDT2	1969	243.119	244.840	99.3%
LDT2	1970	257.403	259.123	99.3%
LDT2	1971	253.366	253.366	100.0%
LDT2	1972	345.455	345.454	100.0%
LDT2	1973	367.132	367.132	100.0%
LDT2	1974	272.309	274.006	99.4%
LDT2	1975	149.987	152.844	98.1%
LDT2	1976	175.004	176.031	99.4%
LDT2	1977	228.003	231.798	98.4%
LDT2	1978	279.084	283.345	98.5%
LDT2	1979	292.667	338.422	86.5%
LDT2	1980	253.411	283.680	89.3%
LDT2	1981	186.685	354.017	52.7%
LDT2	1982	137.460	429.802	32.0%
LDT2	1983	38.697	455.725	8.5%
LDT2	1984	133.001	1,005.232	13.2%
LDT2	1985	69.562	1,473.149	4.7%
LDT2	1986	79.022	2,414.753	3.3%
LDT2	1987	43.141	2,404.837	1.8%
	TOTAL LDT2	***4,236.047***		
MDV	1965	17.103	17.103	100.0%
MDV	1966	9.366	9.366	100.0%
MDV	1967	8.602	9.087	94.7%
MDV	1968	15.797	15.798	100.0%
MDV	1969	17.925	17.925	100.0%
MDV	1970	22.565	22.566	100.0%
MDV	1971	18.638	18.639	100.0%
MDV	1972	30.914	30.916	100.0%
MDV	1973	40.836	41.389	98.7%
MDV	1974	217.067	217.068	100.0%
MDV	1975	225.970	226.665	99.7%
MDV	1976	306.338	306.339	100.0%
MDV	1977	474.019	474.700	99.9%
MDV	1978	408.403	408.405	100.0%
MDV	1979	496.554	497.294	99.9%
MDV	1980	193.758	193.761	100.0%
MDV	1981	180.549	184.238	98.0%
MDV	1982	198.413	214.750	92.4%
MDV	1983	142.619	274.586	51.9%
MDV	1984	418.633	434.835	96.3%
	TOTAL MDV	***3,444.068***		
TOTAL VEHICLES		963,536.400		
TOTAL TG 1-7		26,801.609		
% OF TOTAL		**2.78%**		

2010 Summary

Veh Type	Veh Year	TGP (x1000)	TotP (x1000)	% of TotP
LDA	1966	728.149	729.124	99.9%
LDA	1967	666.324	667.453	99.8%
LDA	1968	646.154	646.503	99.9%
LDA	1969	696.347	696.998	99.9%
LDA	1970	605.605	606.681	99.8%
LDA	1971	496.416	496.834	99.9%
LDA	1972	593.822	596.017	99.6%
LDA	1973	613.049	614.466	99.8%
LDA	1974	471.000	472.843	99.6%
LDA	1975	284.473	288.840	98.5%
LDA	1976	347.733	351.672	98.9%
LDA	1977	459.493	485.760	94.6%
LDA	1978	647.690	710.131	91.2%
LDA	1979	678.873	818.051	83.0%
LDA	1980	209.749	605.396	34.6%
LDA	1981	127.998	769.213	16.6%
LDA	1982	140.614	880.851	16.0%
LDA	1983	149.781	1,144.968	13.1%
LDA	1984	26.331	1,843.312	1.4%
	TOTAL LDA	***8,589.600***		
LDT1	1966	150.962	151.483	99.7%
LDT1	1967	137.079	137.599	99.6%
LDT1	1968	190.132	191.305	99.4%
LDT1	1969	239.112	239.684	99.8%
LDT1	1970	252.259	252.842	99.8%
LDT1	1971	292.306	293.966	99.4%
LDT1	1972	424.511	424.511	100.0%
LDT1	1973	387.946	388.412	99.9%
LDT1	1974	119.660	121.186	98.7%
LDT1	1975	80.816	81.314	99.4%
LDT1	1976	91.065	91.557	99.5%
LDT1	1977	121.103	124.248	97.5%
LDT1	1978	158.142	165.084	95.8%
LDT1	1979	208.044	229.687	90.6%
LDT1	1980	129.042	155.191	83.2%
LDT1	1981	94.796	202.539	46.8%
LDT1	1982	61.873	213.832	28.9%
LDT1	1983	17.427	229.042	7.6%
LDT1	1984	48.350	398.396	12.1%
LDT1	1985	20.355	475.097	4.3%
LDT1	1986	19.188	646.869	3.0%
LDT1	1987	11.031	653.041	1.7%
	TOTAL LDT1	***3,255.199***		

2010 Summary

Veh Type	Veh Year	TGP (x1000)	TotP (x1000)	% of TotP
LDT2	1966	89.585	90.439	99.1%
LDT2	1967	76.740	76.740	100.0%
LDT2	1968	101.683	101.683	100.0%
LDT2	1969	168.791	170.499	99.0%
LDT2	1970	176.806	178.514	99.0%
LDT2	1971	173.313	173.314	100.0%
LDT2	1972	239.237	239.237	100.0%
LDT2	1973	258.503	258.503	100.0%
LDT2	1974	195.013	195.353	99.8%
LDT2	1975	109.197	109.768	99.5%
LDT2	1976	135.786	136.398	99.6%
LDT2	1977	186.101	188.594	98.7%
LDT2	1978	240.544	243.047	99.0%
LDT2	1979	251.307	284.530	88.3%
LDT2	1980	217.352	243.496	89.3%
LDT2	1981	159.004	302.536	52.6%
LDT2	1982	116.658	360.235	32.4%
LDT2	1983	32.264	376.760	8.6%
LDT2	1984	104.820	781.872	13.4%
LDT2	1985	51.974	1,098.812	4.7%
LDT2	1986	57.631	1,759.146	3.3%
LDT2	1987	31.994	1,784.045	1.8%
	TOTAL LDT2	***3,174.304***		
MDV	1966	6.304	6.304	100.0%
MDV	1967	5.823	6.009	96.9%
MDV	1968	10.770	10.770	100.0%
MDV	1969	12.265	12.266	100.0%
MDV	1970	15.412	15.413	100.0%
MDV	1971	12.661	12.662	100.0%
MDV	1972	21.198	21.199	100.0%
MDV	1973	27.996	28.392	98.6%
MDV	1974	150.621	150.622	100.0%
MDV	1975	158.748	159.151	99.7%
MDV	1976	227.250	227.251	100.0%
MDV	1977	367.807	368.280	99.9%
MDV	1978	332.531	332.533	100.0%
MDV	1979	406.800	407.318	99.9%
MDV	1980	159.296	159.299	100.0%
MDV	1981	148.195	151.223	98.0%
MDV	1982	162.622	175.821	92.5%
MDV	1983	117.035	224.813	52.1%
MDV	1984	332.762	344.083	96.7%
	TOTAL MDV	***2,676.098***		
TOTAL VEHICLES		1,047,886.000		
TOTAL TG 1-7		17,695.202		
% OF TOTAL		**1.69%**		

Appendix C:
Summary of Operational Greenhouse Gases

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\mba\Desktop\Moon Camp GHG.urb924

Project Name: Moon Camp 2008

Project Location: San Bernadino County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (tons/year unmitigated)	0.86	3.10	2.85	0.00	3.80	0.19	3.99	0.79	0.18	0.97	401.22

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.61	0.15	0.70	0.00	0.04	0.04	197.03

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1.28	2.18	14.94	0.01	2.33	0.47	1,378.00

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1.89	2.33	15.64	0.01	2.37	0.51	1,575.03

Construction Unmitigated Detail Report:

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CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009	0.86	3.10	2.85	0.00	3.80	0.19	3.99	0.79	0.18	0.97	401.22
Mass Grading 01/01/2009-03/30/2009	0.10	0.84	0.46	0.00	2.63	0.04	2.67	0.55	0.04	0.59	76.15
Mass Grading Dust	0.00	0.00	0.00	0.00	2.63	0.00	2.63	0.55	0.00	0.55	0.00
Mass Grading Off Road Diesel	0.10	0.83	0.41	0.00	0.00	0.04	0.04	0.00	0.04	0.04	70.79
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.36
Fine Grading 02/19/2009-03/30/2009	0.05	0.37	0.20	0.00	1.17	0.02	1.19	0.24	0.02	0.26	33.85
Fine Grading Dust	0.00	0.00	0.00	0.00	1.17	0.00	1.17	0.24	0.00	0.24	0.00
Fine Grading Off Road Diesel	0.04	0.37	0.18	0.00	0.00	0.02	0.02	0.00	0.02	0.02	31.46
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38
Trenching 03/19/2009-03/30/2009	0.01	0.08	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.54
Trenching Off Road Diesel	0.01	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.86
Trenching Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68
Asphalt 03/31/2009-04/11/2009	0.02	0.12	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	12.60
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.01	0.09	0.05	0.00	0.00	0.01	0.01	0.00	0.01	0.01	6.38
Paving On Road Diesel	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.49
Paving Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72

Building 03/31/2009-11/21/2009	0.37	1.69	2.05	0.00	0.01	0.12	0.12	0.00	0.11	0.11	268.64
Building Off Road Diesel	0.33	1.47	0.97	0.00	0.00	0.11	0.11	0.00	0.10	0.10	136.99
Building Vendor Trips	0.01	0.17	0.12	0.00	0.00	0.01	0.01	0.00	0.01	0.01	28.09
Building Worker Trips	0.03	0.06	0.96	0.00	0.00	0.00	0.01	0.00	0.00	0.00	103.56
Coating 11/21/2009-12/16/2009	0.31	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45
Architectural Coating	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45

Phase Assumptions

Phase: Fine Grading 2/19/2009 - 3/30/2009 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 16.67

Maximum Daily Acreage Disturbed: 4.17

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/1/2009 - 3/30/2009 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 16.67

Maximum Daily Acreage Disturbed: 4.17

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 3/19/2009 - 3/30/2009 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 3/31/2009 - 4/11/2009 - Default Paving Description

Acres to be Paved: 4.17

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 3/31/2009 - 11/21/2009 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 11/21/2009 - 12/16/2009 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

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Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.15	0.06	0.00	0.00	0.00	189.75
Hearth	0.03	0.00	0.23	0.00	0.04	0.04	6.63
Landscape	0.07	0.00	0.41	0.00	0.00	0.00	0.65
Consumer Products	0.47						
Architectural Coatings	0.03						
TOTALS (tons/year, unmitigated)	0.61	0.15	0.70	0.00	0.04	0.04	197.03

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 10% to 12.5%

Percentage of residences with wood fireplaces changed from 5% to 0%

Percentage of residences with natural gas fireplaces changed from 85% to 87.5%

10/1/2008 10:22:13 AM

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	1.28	2.18	14.94	0.01	2.33	0.47	1,378.00
TOTALS (tons/year, unmitigated)	1.28	2.18	14.94	0.01	2.33	0.47	1,378.00

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	16.67	9.57	dwelling units	50.00	478.50	7,313.54
					478.50	7,313.54

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	47.3	1.3	98.5	0.2
Light Truck < 3750 lbs	9.9	3.0	91.9	5.1
Light Truck 3751-5750 lbs	20.7	1.0	99.0	0.0
Med Truck 5751-8500 lbs	11.1	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.0	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.7	0.0	42.9	57.1

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	1.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.1	68.3	31.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	7.7	84.6	7.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Summary of Operational Greenhouse Gases
Unmitigated
Moon Camp
Prepared by Michael Brandman Associates
Buildout Year 2010

	Emissions (tons per year)				
Source	**Carbon Dioxide**	**Nitrous Oxide**	**Methane**	**Other**	**Metric Tons CO2e**
Motor vehicles	1,378.00	0.18	0.39		1309.49
Natural gas	189.75	0.00	0.02		172.67
Indirect electricity	113.17	0.00	0.00		102.83
Hearth	6.63				6.01
Water transport	0	0.00	0.00		0.00
Landscape	0.65				0.59
Aerosols				0.00	0.00
Refrigerants				0.00	0.00
Total	1,688.20	0.19	0.41	0.00	1591.60

Total	1,532	0.17	0.38	0.00	metric tons per year
GWP	1	310	21	varies	
Total	1,532	52	8	0	MTCO2E per year
Total	0.0015	0.0001	0.0000	0.0000	MMTCO2E per year

Total - all gases	1,592	MTCO2e per year
	0.0016	MMTCO2e per year
California emissions in 2004	500	MMTCO2e per year
Project percent of emissions	0.000318%	
U.S. emissions in 2005	7,260.4	
Project percent of emissions	0.000022%	
Global emissions in 2004	20135	
Project percent of emissions	0.000008%	

Emissions converted from tons per year to metric tons of carbon dioxide equivalents (MTCO2e) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons)

Emissions converted to million metric tons of carbon dioxide equivalents (MMTCO2E) using the formula: MMTCO2e = (metric tons of gas) / (1,000,000).

Electricity - Indirect Emissions

Project: Moon Camp
Prepared by: Michael Brandman Associates
Prepared on: 10/1/2008

Land Use	Units	Electricity Use (kWh/unit/year)*	Electricity Use (kWh/year)
Single Family Residential	50	5,626.50	281,325.00
Total			281,325.00
			281.33 MWh/year

Greenhouse Gas	Emission Factor (pounds per MWh/year)	Emissions (pounds/year)	Emissions (tons/year)
Carbon dioxide	804.54	226,337	113
Methane	0.0067	2	0.001
Nitrous oxide	0.0037	1	0.001

Emission factor source: California Climate Action Registry. General Reporting Protocol. Reporting Entity-Wide Greenhouse Gas Emissions. Version 2.2, March 2007. www.climateregistry.org

Residential electricity usage rate: 5626.50 kwh/unit/year, from South Coast Air Quality Management 1993 CEQA Handbook, Table 9-11-A

* Table E-1 from California Energy Commission. California Commercial End-Use Survey. Consultant Report. March 2006. CEC-400-2006-005

Table E-1: Overview of Energy Usage in the Statewide Service Area

Building Type	Floor Stock (kft^2)	Annual Energy Intensities			Total Annual Usage	
		Electricity (kWh/ft^2)	Natural Gas ($therms/ft^2$)	Natural Gas ($kBtu/ft^2$)	Electricity (GWh)	Natural Gas (Mtherms)
All Commercial	4,920,114	13.63	0.26	25.99	67077	1278.60
Small Office (<30k ft^2)	361,584	13.10	0.11	10.54	4738	38.10
Large Office (>=30k ft^2)	660,429	17.70	0.22	21.93	11691	144.80
Restaurant	148,892	40.20	2.10	209.98	5986	312.60
Retail	702,053	14.06	0.05	4.62	9871	32.50
Food Store	144,209	40.99	0.28	27.60	5911	39.80
Refrigerated Warehouse	95,540	20.02	0.06	5.60	1913	5.30
Unrefrigerated Warehouse	554,166	4.45	0.03	3.07	2467	17.00
School	445,106	7.46	0.16	15.97	3322	71.10
College	205,942	12.26	0.34	34.24	2524	70.50
Health	232,606	19.61	0.76	75.53	4561	175.70
Lodging	270,044	12.13	0.42	42.40	3275	114.50
Miscellaneous	1,099,544	9.84	0.23	23.34	10817	256.60
All Offices	1,022,012	16.08	0.18	17.90	16430	182.90
All Warehouses	649,705	6.74	0.03	3.44	4380	22.40

Appendix B:
Biological Resources Assessment

B.1 - Results of Bald Eagle Survey on Tentative Tract 16136 (Bontera Consulting, 2002)

Bonterra
CONSULTING
An Environmental Planning/Resource Management Corporation

April 16, 2002

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618-2027

VIA FACSIMILE AND MAIL
(949) 472-8373

Subject: Results of Bald Eagle surveys on Tentative Tract 16136, Moon Camp, Fawnskin, San Bernardino County, California

Dear Mr. Lajoie:

This letter report presents the results of bald eagle (*Haliaeetus leucocephalus*) surveys performed in February 2002 by William S. La Haye and Brian Kertson on Tentative Tract 16136 in unincorporated San Bernardino County, California (hereafter referred to as the project site). In addition, a summary of a records search of historic sightings of this species on and in the vicinity of the project site is also presented.

Project Location and Description

The project site consists of an approximately 62.5-acre parcel on the north shoreline of Big Bear Lake, San Bernardino County, California. The project site is covered by U.S. Geological Survey's Fawnskin, California Quadrangle at Township 2N, Range 1E and includes portions of Sections 7 and 12. Project regional location and vicinity maps are presented in Exhibits 1 and 2, respectively.

The southwestern portion of the project site includes shoreline of Big Bear Lake and Highway 38 parallels the lakeshore on the property for approximately 1/4 mile. Historically, the project site consisted of Moon Camp, a small cabin resort which existed from the early 1920s through 1951 when a forest fire destroyed most of the buildings. At some later date, most of the remnants of the cabins and foundations were removed from the site.

The project site includes a series of low, rolling hills between approximately 6,940 feet above mean sea level (msl) and 6,740 feet above msl. The vegetation on the site is primarily open Jeffrey pine (*Pinus jeffreyi*) forest near the lake and highway and gradually transitions into mixed-conifer forest towards the northeast portion of the property. Other common trees encountered on the site consist of white fir (*Abies concolor*) and black oak (*Quercus kelloggii*).

Background

The bald eagle is a large raptor which ranges from Alaska to northern Mexico. It typically nests in large trees near lakes and rivers where its prey is plentiful. This species feeds primarily on fish and waterfowl; however, it is also known to

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scavenge large mammal carcasses. The bald eagle population declined dramatically in the 1960s due to the effects of pesticides causing egg shell thinning and reproductive failure. This species is federally-listed as Threatened and state-listed as Endangered.

The bald eagle rarely nests in southern California. However, small wintering populations are found scattered throughout the region. Big Bear Lake supports the largest of these wintering populations and may include as many as 30 individuals in peak years. This species is typically observed at Big Bear Lake between November and March.

Survey Methodology

The project site and the surrounding area was observed on four separate occasions in February 2002 for approximately four hours on each occasion. Trees on the property were visually scanned using binoculars and a spotting scope. Observations were conducted from various vantage points on the property, as well as from Windy Point, approximately 1/2 mile west of the property across Grout Bay. All trees utilized by eagles for perching and/or roosting during these surveys were marked with numbered, circular tree tags. Additionally, the San Bernardino National Forest Service was contacted and a review of their historic records of bald eagle use on the north shore of Big Bear Lake was completed.

Survey Results

Bald eagle observations were performed on February 7, 12, 14, and 21, 2002. Bald eagles were observed on the project site on all four occasions. A minimum of nine, seven, three, and four individual bald eagles were seen on the four observation dates, respectively. Bald eagles were observed perching in three, eight, two, and two separate trees on the project site on the respective observation dates. Nine individual trees were used on the project site by bald eagles during surveys. The sizes and descriptions of the trees used for perching are provided in Table 1. Tree locations on the project site are presented in Exhibit 3.

The best and most reliable data for reviewing historical use of the project site by bald eagles was an unpublished report by Devaud and Devaud in 1990 which presented the findings of surveys conducted during the winter of 1989-1990. The Devauds observed, mapped, and photographed bald eagle perch trees along the north shoreline of Big Bear Lake between December 10 and April 6 of that winter. Eighty of the 176 mapped eagle sightings (45 percent) were located on the project site. The most commonly recorded use of a single perch tree was also on the project site with 51 sightings (i.e., tree number 886). This is clearly the most important eagle perch tree on the project site and potentially the most important on the north shore of Big Bear Lake. The next most commonly recorded use of a single perch tree was off the project site near the east end of the lake with 32 sightings.

Recommendations

The project site contains several trees used extensively by this wintering population of bald eagles. Removal of these trees could restrict access to and/or affect the ability of individual eagles to forage in the vicinity of Big Bear Lake. Removal of important perch trees could be considered a significant impact under the federal and state Endangered Species Acts (ESA). It is recommended that the numbered trees presented in Table 1 are avoided during project construction and preserved in place upon project completion. Additionally, all large trees (i.e., greater than 20-inches diameter at four feet from ground) within approximately 200 yards of the

high water line should be considered potential perch trees, avoided during construction, and preserved in place upon project completion, if possible.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Principal, Biological Services

Samuel C. Stewart IV
Assistant Project Manager

R:\Projects\RBF\J008 Eagle Survey-041602.wpd

Enclosures: Table 1 and Exhibits 1-3

References

Devaud J. & Devaud S. 1990. *Bald Eagle Habitat Use of the North Shore of Big Bear Lake, San Bernardino County, California.* Unpublished Document in San Bernardino National Forest Service Files.

Environmental Planning Consultants. 1988. *Big Bear Lake Bald Eagle Cumulative Impact Study.* Unpublished Document in San Bernardino National Forest Service Files.

B.2 - Bald Eagle Count in Area (U.S. Fish and Wildlife Service, 2009)

US Forest Service
San Bernardino National Forest

602 S. Tippecanoe Ave San Bernardino, CA 92408

FOR IMMEDIATE RELEASE

Big Bear Lake and Lake Arrowhead Contact: Robin Eliason – reliason@fs.fed.us; 909-382-2832(o) or 909-844-4131(c)
Lake Hemet Contact: Heidi Hoggan hhoggan@fs.fed.us; 909-382-2945
Silverwood Lake State Recreation Area Contact: Kathy Williams - khwilliams@parks.ca.gov; 760-389-2303(o); 760-963-7911(c); or Kevin Forester - kforrester@parks.ca.gov

BALD EAGLES SEEN IN LOCAL MOUNTAINS

SAN BERNARINO, Calif. January 10, 2009 - On Saturday January 10th, the first bald eagle count of the winter was conducted by local Federal and State biologists and volunteers around lakes in the San Bernardino and San Jacinto Mountains. Despite extremely windy conditions, large numbers of volunteers turned out for a chance to see one of our magnificent national birds. High wind gusts made standing challenging and kept knocking over some of the spotting scopes. Nonetheless, the effort was successful in tallying the bald eagles spending their winter vacations at local mountain lakes.

A grand total of twelve eagles (8 adults, 4 juveniles) were observed in the four lake areas during the 1- hour count. Six eagles (4 adults, 2 juveniles) were observed in the Big Bear/Baldwin Lake area; 2 eagles (1 adult, 1 juvenile) at Lake Arrowhead; 3 eagles (2 adults, 1 juvenile) at Silverwood Lake; and, 1 adult eagle at Lake Hemet. Juvenile eagles are distinguished by a brown head and tail; adults are recognized by the famous white head and tail - it takes 4-5 years to acquire full adult coloration. Juvenile eagles are the same size as the adults.

The count for Big Bear was a little lower than average; probably due in part to the fact that a large portion of the lake has been frozen over for several weeks. When the lake is frozen, ducks do not stay in the area. Ducks are the main prey for bald eagles; so when there are low numbers of ducks, there are low numbers of bald eagles.

Approximately 140 volunteers participated in the 1-hour eagle census at four lakes (50 at Big Bear area; 15 at Lake Arrowhead; a record 50 at Lake Hemet; and, 25 at Silverwood Lake). The Forest Service and State Recreation Area biologists would like to thank those volunteers!

The U.S. Forest Service and State Recreation Area biologists have coordinated counts of this federally-protected species since 1978. Data from our local count will be added to the nation-wide Mid-Winter Bald Eagle census to assess recovery status of the species. We rely on volunteers to gather information during the monthly winter eagle counts. Counts are conducted

for a 1-hour period from 9-10 a.m. Forest Service volunteers stationed around lakes in Big Bear, Arrowhead, and Idyllwild record all observations of bald eagles. Volunteers at Silverwood Lake State Recreation Area conduct simultaneous counts.

Bald eagles are similar to many southern Californians in that they visit the lakes of our San Bernardino and San Jacinto Mountains for their winter vacations between November and April. Instead of vacationing here for dynamite skiing, eagles come for the plentiful food supplies. As lakes and rivers up north freeze each winter, fish become unavailable under a thick layer of ice and ducks leave the frozen waters. The eagles' "grocery stores" have essentially closed for the winter. So eagles fly south looking for open water stocked with food. The lakes of the San Bernardino and San Jacinto Mountains fit the bill perfectly--they are part of the Pacific Migratory Flyway, a migration freeway for millions of ducks. Eagles like to spend their winters here because of the abundant and tasty ducks and fish.

Our bald eagles normally migrate out of the San Bernardino and San Jacinto Mountains in late March, heading back to summer homes in Montana, Wyoming, Idaho, and Alberta, Canada. In recent years, a pair of bald eagles has remained at Lake Hemet and successfully produced several eaglets.

Catching a glimpse of our breath-taking national bird is relatively easy during the winter months. There are also some fantastic opportunities for excellent close-up photography. Just look in the tallest trees around the lakeshore. Or, if the lake is partially frozen, look for eagles perched on the ice near small groups of ducks using open water pockets.

Remember that human presence may distract or disturb the eagles--so, try to limit your movements and don't make loud noises when nearby. If possible, remain in your car while observing eagles--the car acts as a blind.

Don't forget to mark your calendars now for the remaining Eagle Counts: February 14, and March 14. Volunteers need not have experience--just bring binoculars and a watch (and dress warmly!).

For More Information about Bald Eagle Counts
Big Bear Lake and Lake Arrowhead Contact:
Robin Eliason – reliason@fs.fed.us; 909-382-2832
Lake Hemet Contact: Heidi Hoggan
hhoggan@fs.fed.us; 909-382-2945
Silverwood Lake State Recreation Area Contact:
Kathy Williams - khwilliams@parks.ca.gov; 760-389-2303

For More Information about Discovery Center Eagle Events
Call 909-382-2790 or stop by the Forest Service's Big Bear Discovery Center on the north side of Big Bear Lake
http://www.bigbeardiscoverycenter.com

For information about the San Bernardino National Forest, please visit: http://www.fs.fed.us/r5/sanbernardino

For information about Silverwood State Recreation Area, please visit:

http://www.parks.ca.gov/?page_id=650

BIG BEAR LAKE EAGLE COUNT SUMMARY

(Includes Big Bear and Baldwin Lakes)

1979 - 80		20	22	13	11	3	14	22
1980 - 81		11	19	25			18	25
1981 - 82		15	27	22	6	3	15	27
1982 - 83		7	27	18	11		16	27
1983 - 84		14	28	18	10		18	28
1984 - 85		27	8	3	3		10	27
1985 - 86		20	24		9		18	24
1986 - 87		20	24		9		18	24
1987 - 88		9	17	21	16		16	21
1988 - 89		12	6	4	12		9	12
1989 - 90		15	11	19	17		16	19
1990 - 91		6	16	22	17		15	22
1991 - 92		19	19	13	9		15	19
1992 - 93		6	15	3	3		7	15
1993 - 94		9	17	15	8		12	17
1994 - 95		10	10	20	No Count		13	20
1995 - 96		6	14	15	10		11	15
1996 - 97		10	15	5	9		10	15
1997 - 98		8	14 - 15	15	12		12	15
1998 - 99		8	17	15 - 17	9		11	17
1999 - 00		8	13	3	13		9	13
2000 - 01		13	13	14	12		13	14
2001 - 02		7	9	11	9		9	11
2002-03		6	13	15	9		11	15
2003-04		4	14	11	7		9	14
2004-05		6	1	4	5		4	6
2005-2006		7	4	6	No Count		6	7
2006-2007		4	8	5	5		6	8
2007-2008		4	3	6	3		4	6
2008-2009		No Count	6					
Average		11	15	13	10	5	12.26	18.14
						Maximum	18	28
						Minimum	4	6
						Median	12	17

B.3 - Focused Flying Squirrel Trapping Report (Michael Brandman Associates, 2007)

FOCUSED FLYING SQUIRREL TRAPPING REPORT MOONCAMP PROJECT, FAWNSKIN, SAN BERNARDINO COUNTY, CALIFORNIA

Prepared for:

County of San Bernardino
Department of Land Use Services
385 N. Arrowhead Avenue, First Floor
San Bernardino, California 92415-0182

Contact: Matthew W. Slowick, Senior Planner

Prepared by:

Michael Brandman Associates
621 E. Carnegie Drive, Suite 100
San Bernardino, California 92408
909.884.2255

Contact: Mikael Romich, Project Biologist

September 18, 2007

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SECTION 1: SUMMARY

This report contains the findings of Michael Brandman Associates (MBA) focused trapping survey for the San Bernardino flying squirrel (*Glaucomys sabrinus californicus*) (SBFS) on an approximately 62.5-acre property known as Tentative Tract 16136 (Moon Camp) located in the Community of Fawnskin, San Bernardino County, California. During the trapping period, no SBFS were caught on the project site. This effort provides reasonable evidence (defined by the USFWS (1990) as one week of trapping) that SBFS were absent from the project site during the period trapped. A number of mitigation measures are provided to minimize the potential for indirect and direct impacts, as well as enhancement of adjacent areas to compensate for the removal of suitable habitat.

SECTION 2: INTRODUCTION

At the request of San Bernardino County, MBA conducted a focused SBFS trapping survey with methods modified from survey protocols issued by the US Fish and Wildlife Service (USFWS 1990) and United States Department of Agriculture (USDA 1991) for a 62.5-acre property located in the Community of Fawnskin, San Bernardino County, California. This property is hereinafter referred to as project site or site.

2.1 - Project Location

The site is located in the San Bernardino National Forest, north of Big Bear Lake. State Highway 38 intersects the Site on the southern portion. The site is located south of Flicker Road, east of Oriole lane, and west of Polique Canyon Road, in the unincorporated community of Fawnskin, San Bernardino County, California (Exhibits 1 and 2). The Site consists of Assessor's Parcel Numbers 0304-082-04, 0304-091-12, -13, and -21. It is within sections 7 and 12, Township 2 North and Range 1 East of the Fawnskin U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Exhibit 3).

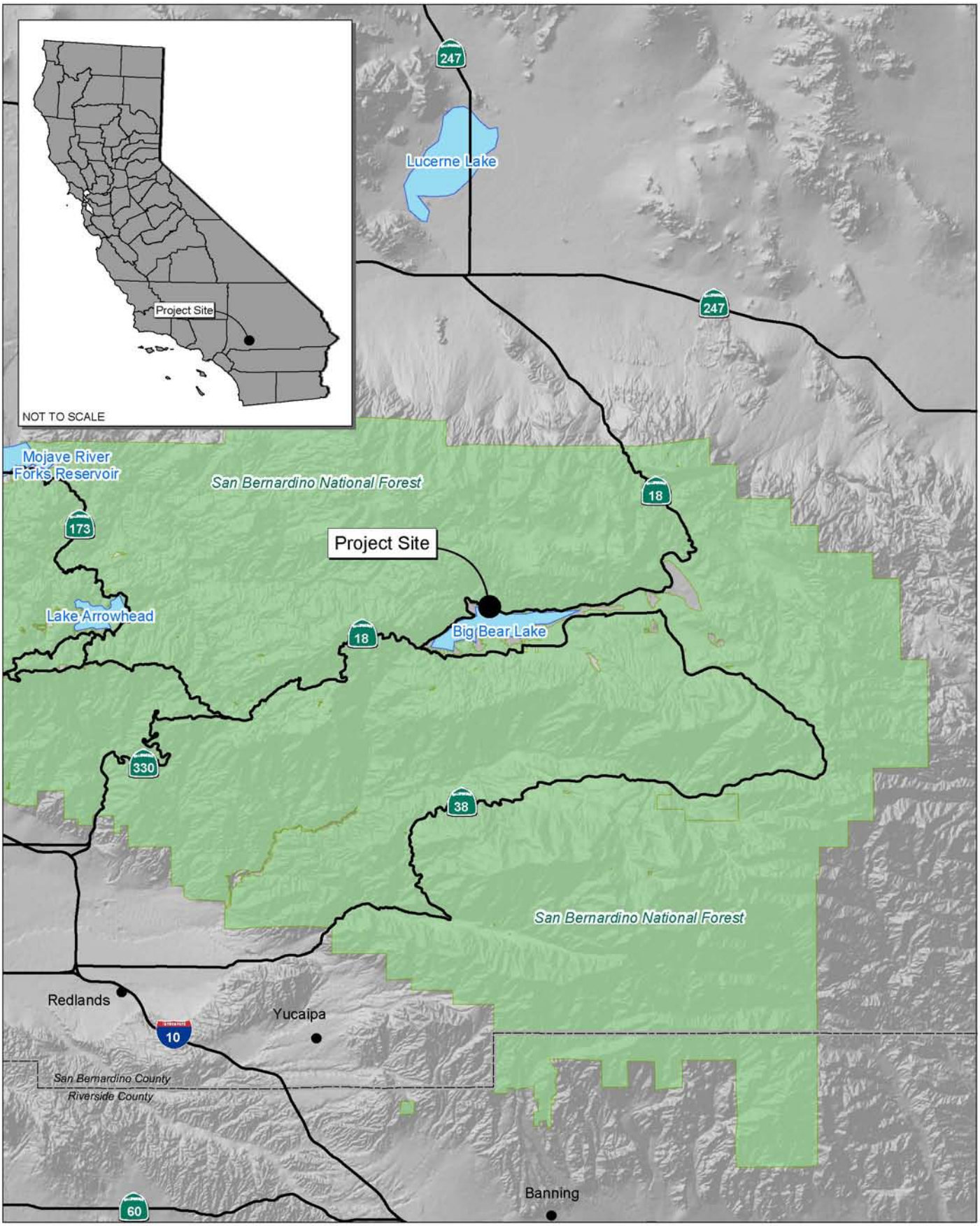
2.2 - Project Description

The proposed project is to subdivide the Site into 53 lots: fifty residential lots to be sold individually and developed into custom homes and 3 lettered lots, two of which would be designated as Open Space/Conservation easements.

2.3 - Environmental setting

Site elevations range from approximately 6,747 feet above mean sea level (msl) at the lakeshore to 6,960 feet above msl at the northeast corner of the Site. Individual slopes onsite range from five percent to forty percent. Slope orientation is generally from north to south toward the lake, except for three natural ravines on the project site that contain eastern and western slopes.

The dominant plant community observed on the site is Jeffrey pine forest (54.91 acres), which includes Jeffrey pine (*Pinus jeffreyi*), white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak occurring at lower densities. The Jeffrey pine forest onsite is unevenly aged composed of approximately 85 percent Jeffrey pine, eight percent western juniper, six percent singleleaf pinyon pine, and less than 1 percent of scattered white fir and black oak. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), Greg's ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl leaf mountain mahogany (*Cercocarpus ledifolius*).



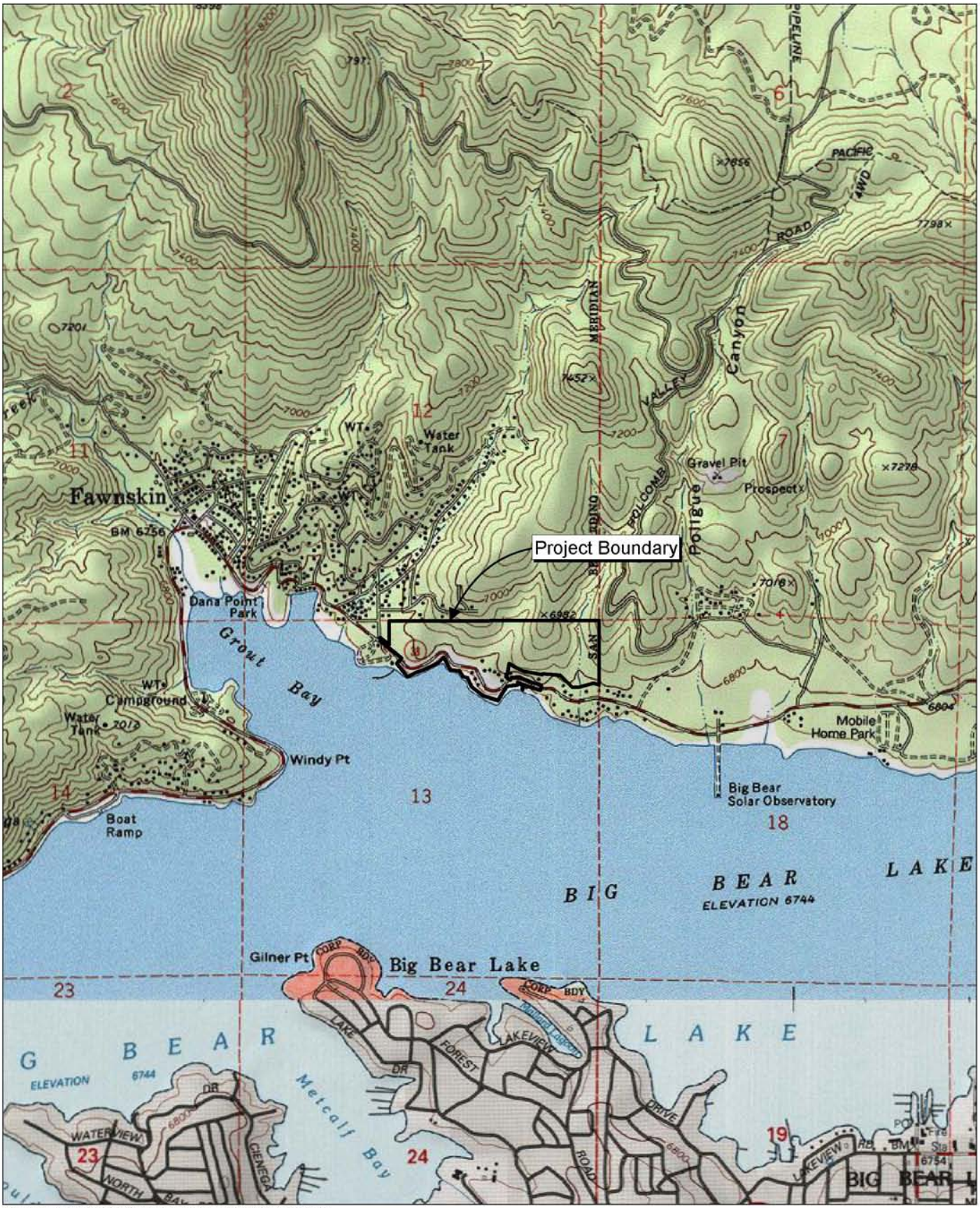
Source: Census 2000 Data, The CaSIL, MBA GIS 2007.

Michael Brandman Associates

NORTH

5 2.5 0 5 Miles

Exhibit 1
Regional Location Map



Source: TOPO! USGS Fawnskin (1996) 7.5' DRG.

NORTH

2,000 1,000 0 2,000

Feet

Michael Brandman Associates

00520089 • 08/2007 | 2_local_topo.mxd

Exhibit 2
Local Vicinity
Topographic Base

TT 16136 • FAWSKIN, SAN BERNARDINO COUNTY, CA
FLYING SQUIRREL SURVEY REPORT

Source: National Agriculutre Imagery Program, San Bernardino County (2005).

Michael Brandman Associates

NORTH

2,000 1,000 0 2,000

Feet

Exhibit 3
Local Vicinity Aerial Base

00520089 • 08/2007 | 3_aerial_aerial.mxd

TT 16136 • FAWSKIN, SAN BERNARDINO COUNTY, CA
FLYING SQUIRREL SURVEY REPORT

Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches. Approximately 17.38 acres of the Jeffrey pine forest on the site contain few trees and fairly open canopy. The open Jeffrey pine forest and where Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*) occur is suitable habitat for a number of sensitive plant species.

The pebble plain plant community occurs on 0.69 acre of the site north of State Route 38. It appears as a distinct open patch within open Jeffrey pine forest in the western portion of the site. The substrate in this area consists of clay soil mixed with quartzite pebbles and gravel that are continually pushed to the surface through frost action. This substrate supports a high floristic diversity consisting of small cushion-forming plants, tiny annuals, grasses, and succulents that are well spaced, low growing, and sun tolerant. Several sensitive plant species are associated with pebble plain habitat.

Approximately 4.14 acres of the southern boundary of the site is formed by the shore of Big Bear Lake. Plant species along the shore itself consisted primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Vegetation is patchy above the high-water level where small areas of Jeffrey pine forest are interspersed among open meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laviegata*).

2.4 - Disturbances

Recent activity on the project site includes the removal of trees, which appeared to be either taken offsite or chipped onsite. The greatest disturbance from the tree removal activity would be to cavity-dwelling birds and mammals, and sensitive plant species that have been located on the project site, including the Federally-listed Threatened and California Native Plant Society (CNPS) List 1B species, ash-gray Indian paintbrush (*Castilleja cinerea*); and three CNPS List 1B species, Parish's rock cress (*Arabis parishii*), Big Bear Valley woollypod (*Astragalus leucolobus*), and silver-haired ivesia (*Ivesia argyrocoma*). It is not known if precautions prior to tree removal were made to avoid the known locations of these plants. In addition, the ingress and egress of vehicles involved in the tree removal and the potential dragging of trees offsite has caused the understory vegetation and ground to be heavily disturbed. Finally, there appeared to be direct mechanical removal of some understory shrubs. A number of wildlife trees (or snags) were marked with "WL" and were not removed. Some thinning of trees, including black oak (*Quercus kellogii*), was evident, particularly at the lower portions of the tree trunk.

2.5 - San Bernardino Flying Squirrel

2.5.1 - Status

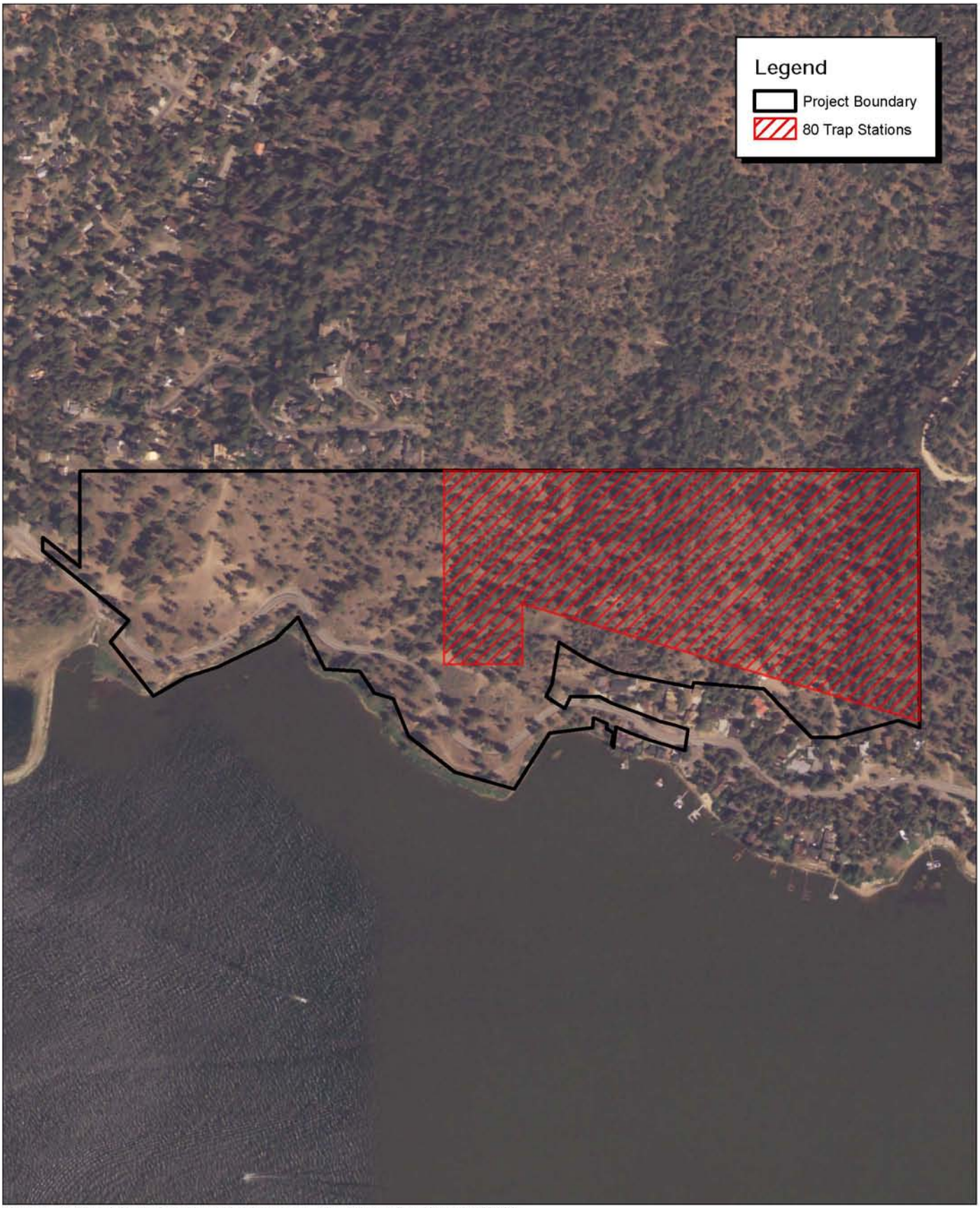
The SBFS is considered a California special concern (CSC) species by the California Department of Fish and Game (CDFG) and is on the Forest Service's sensitive wildlife species list. SBFS is a

sensitive species because of declining population levels, limited ranges, and continuing threats have made them vulnerable to extinction. The goal of designating sensitive species is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long term viability.

2.5.2 - Biology

The SBFS is a subspecies of the northern flying squirrel (*Glaucomys sabrinus*), a small arboreal sciurid found in forested regions over most of North America. They are found typically in habitats dominated by conifers or with a mixed coniferous-deciduous overstory. Stomach and fecal analyses indicate that flying squirrels consume primarily hypogeous fungi (*mycophagists*) during snow-free periods and lichens during winter. A fecal analysis was conducted on SBFS in the San Bernardino Mountains (Butler et al. 1991) showing spores from three genera of hypogeous fungi (*Melanogaster*, *Hymenogastor*, and *Gymnomyces*). Other food items found in descending order of abundance included Jeffrey pine pollen, dicot and monocot plant material, and spores from epigeous fungi (associated with decomposing wood and litter) (Butler et al. 1991). SBFS do not appear to be territorial, and individuals are often seen feeding and denning together. They inhabit two types of nests, those inside tree cavities and those constructed in the canopy of conifers, especially those infected with broom rust (*Chrysomyxa*).

SBFS can occur in Jeffrey pine/white fir mixed conifer forests with some oak components. From the study efforts in the San Bernardino Mountains (Butler et al. 1991; Driessen et al. 1998), habitat at successful trapping sites can be characterized as mature to over-mature mixed conifer forest with relatively high numbers of snags and downed logs. The habitat is relatively open and lacks a dense undergrowth component. The canopy is relatively closed. The dominant species on site were Jeffrey pine and white fir. All sites also had a black oak component in the vegetation mix. The successful trapping sites can also be characterized as having a heavier duff level than surrounding areas. All of the sites also have either ephemeral streams/springs or intermittent streams with some riparian vegetation in close proximity.



Source: National Agriculutre Imagery Program, San Bernardino County (2005).

Michael Brandman Associates

NORTH

500 250 0 500

Feet

Exhibit 4
Flying Squirrel Trapping Grid

00520089 • 08/2007 | 4_flying_squirrel_trapping.mxd

TT 16136 • FAWSKIN, SAN BERNARDINO COUNTY, CA
FLYING SQUIRREL SURVEY REPORT

SECTION 3: METHODOLOGY

MBA biologists Mikael Romich and James Hickman conducted a focused SBFS trapping survey with methods modified from survey protocols issued by the USFWS (1990) and USDA (1991). To evaluate the presence of a SBFS population on the project site, traps were placed within suitable Jeffrey pine forest habitat.

The project site had a live trapping grid consisting of 80 stations located at 40-meter intervals (Exhibit 4). One Tomahawk livetrap (Model 201, Tomahawk Live Trap Company, Tomahawk, Wisconsin) equipped with shelter (plastic container) and batting (polyster fiberfill) was mounted 1.5 meters aboveground on a tree trunk at each trap station. Each trap station was selectively chosen based on the proximity of a suitable tree. The order of preference for trap locations was based on the diameter at breast height (DBH) and the height of the tree: tall dead snag (dead and dying tree) with large DBH, tall alive tree with large DBH, short dead snag with large DBH, and short alive tree with small DBH. Traps were located at each of these categories. Traps were covered with debris, such as pine needles and bark, to break the outline and provide shelter.

Squirrels were live trapped for five nights, from the evening of June 24 when traps were first set to the morning June 29, 2007 when traps were checked and picked up. Traps were set before dark each day and checked the next morning. Traps remained closed during the day. Traps were baited with a mixture of peanut butter, molasses, and whole oats. Prior to the trapping effort, traps were pre-baited with sunflower seeds that were placed on top of the closed trap for a period of three nights (June 21 to June 24, 2007). Pre-baiting allows animals to acclimate to the trap and increases capture success (USFWS 1990). These methods are summarized in Table 1.

Table 1: Summary of 2007 SBFS Trapping Survey at the Moon Camp Project Site

2007 Date	Activity
June 21	Traps placed on site and pre-baited with sunflower seeds in a locked closed position.
June 24	Traps baited with peanut butter mixture and triggered
June 25-June 28	Traps checked in morning and locked shut
June 25-28	Traps opened and triggered each evening
June 29	Traps checked in morning and collected

The timing of this trapping session occurred when SBFS were previously trapped in close proximity to the Site (approximately 0.5 mile north of the northern boundary of the project site); the 1998 survey occurred from June 25 through July 7, 1998 and a total of 6 SBFS were caught, all in Tomahawk traps that were placed on tree trunks (Driessen et al. 1998). Although Carey et al. (1991) recommends a trap placed on the ground, this was not necessary because SBFS were shown to be trappable on tree trunks.

SECTION 4: RESULTS AND DISCUSSION

SBFS was not captured on the project site. Non-target species that were caught included Merriam's chipmunk (*Tamias merriami*) (minimum known to be alive was 10 individuals), two dusky-footed woodrat (*Neotoma fuscipes*), and one Steller's jay (*Cyanocitta stelleri*).

With the presence of a Jeffrey pine/white fir mixed conifer forest, dead and downed woody debris, and snags, the conditions of the site appeared suitable to SBFS. However, the project site had been subject to a disturbance regime (tree and shrub removal activity) that may have affected its suitability for SBFS. Potential impacts of this disturbance regime include: (1) removal of trees with cavities or stick nests needed by SBFS; (2) disturbance of the substrate could reduce the quantity and quality of hypogeous (underground) fungi (truffles), which compose northern flying squirrel diets at this time of the year (Ransome and Sullivan 2004; Butler et al. 1998)). It should be noted that this trapping session occurred during a drought year, which would reduce fungal production (Villa et al. 1999) and result in a lower abundance of SBFS as they are known to be primarily limited by the availability of food resources (Ransome and Sullivan, 1997, 2004). Due to these confounding factors, mitigation measures are proposed in Section 5 that would reduce potential impacts if the survey area becomes occupied by SBFS in the future.

SECTION 5: CONCLUSION

No SBFS were trapped during this focused survey effort, which provides reasonable evidence that SBFS were absent from the project site during the period trapped. Although the USFWS (1990) recommends that an area be trapped during more than one season, it is not mandatory. However, due to the suitability of the habitat and proximity of trapping records approximately 0.5 mile to the north (Driessen et al. 1998), the Site may receive seasonal use by SBFS that would not be detectable with this survey. The following mitigation measures are recommended to minimize potential impacts to SBFS that could be seasonally using the site:

1. Minimizing the number of trees, snags, and downed wood removed for project implementation;

2. Having a biologist qualified with SBFS as a monitor during tree removal;

3. Compensating the removal of snags containing cavities; this would be achieved by constructing and erecting two nest boxes and one aggregate box per snag removed. Appendix B provides the specifications of the nest and aggregate boxes (Flying Squirrels 2007). These boxes should be located on the adjacent USFS land (with their permission) and the locations marked with a global positioning system. This locations of the boxes shall be provided to the USFS so that their biologists could monitor the boxes for occupation by SBFS.

4. Adjacent night lighting shall be reduced to the greatest extent practicable and lights shall be designed with hoods or shields that reduce the amount of light spilling into the adjacent habitat, particularly on the northern edge; and

5. Provide new homeowners with a flyer that would provide information on the biology of SBFS and how they are susceptible to depredation by cats. The flyer would also outline steps that homeowners could take to reduce their urban edge effects.

SECTION 6: CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: September 18, 2007 Signed: _____

Mikael Romich, TE068799-1

SECTION 7: LITERATURE CITED

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Appendix A: Nest and Aggregate Box Specifications

Simple Nesting Box Plan for the Northern Flying Squirrel

(Glaucomys sabrinus)

[for Southern Flying Squirrel (Glaucomys volans) take one inch off all dimensions. Access hole must be exactly 1.25 in. (3.175 cm). Place in deciduous or mixed forest.]

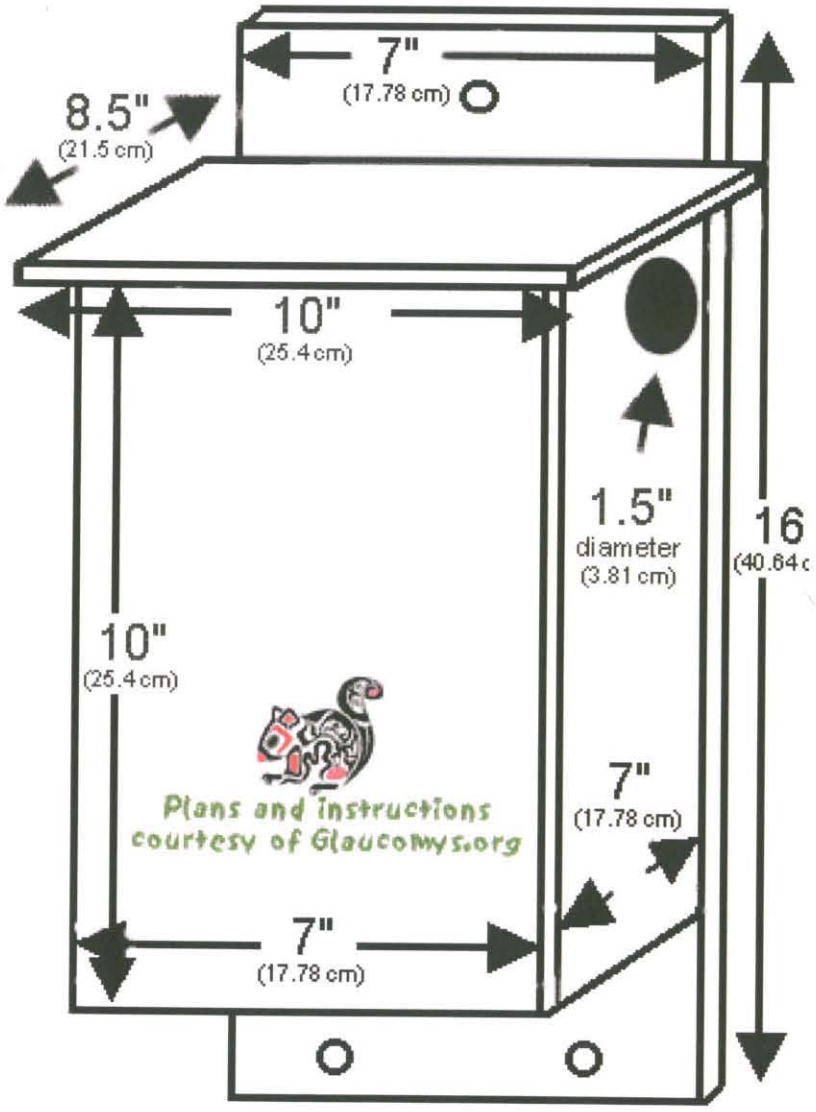
*Note - before beginning construction of this nesting box, do your research and confirm which species of flying squirrel inhabits your geographic region!

1. Ensure access hole size is no larger than specified. You may wish to install a sheet metal occluder around entrance to prevent hole enlargement by unwanted species. No sharp edges!

2. Run a bead of water-based siliconized caulking along length of top where it meets backing board to prevent water infiltration and seal all cracks and gaps accordingly. Drill (4) 1/2" (12.7mm) holes near corners of bottom and (2) 1/2" (12.7mm) holes on each side near bottom for ventilation purposes.

3. Use natural (untreated) softwood ONLY. Thickness - 3/4" (19mm) to 1" (25mm). DO NOT stain or paint interior or exterior. DO NOT use plywood or chipboard. Wear gloves when handling wood, as salt from sweaty hands will encourage porcupines to chew the box.

4. If the wood you use is smooth-planed, roughen exterior and interior panels with rasp or coarse sandpaper for better "gripability".



5. Though not absolutely necessary, it is advisable to provide a hinged access door for cleaning purposes. Clean ONLY during January or February, as box will be vacant during this period. Front or side door access is preferred over top door access. Only adults should do the cleaning, and always wear leather gardening gloves when performing a clean-out! Some other animals you might find using this nesting box are: birds, tree frogs, spiders, hornets, bumblebees and deer/white-footed mice.

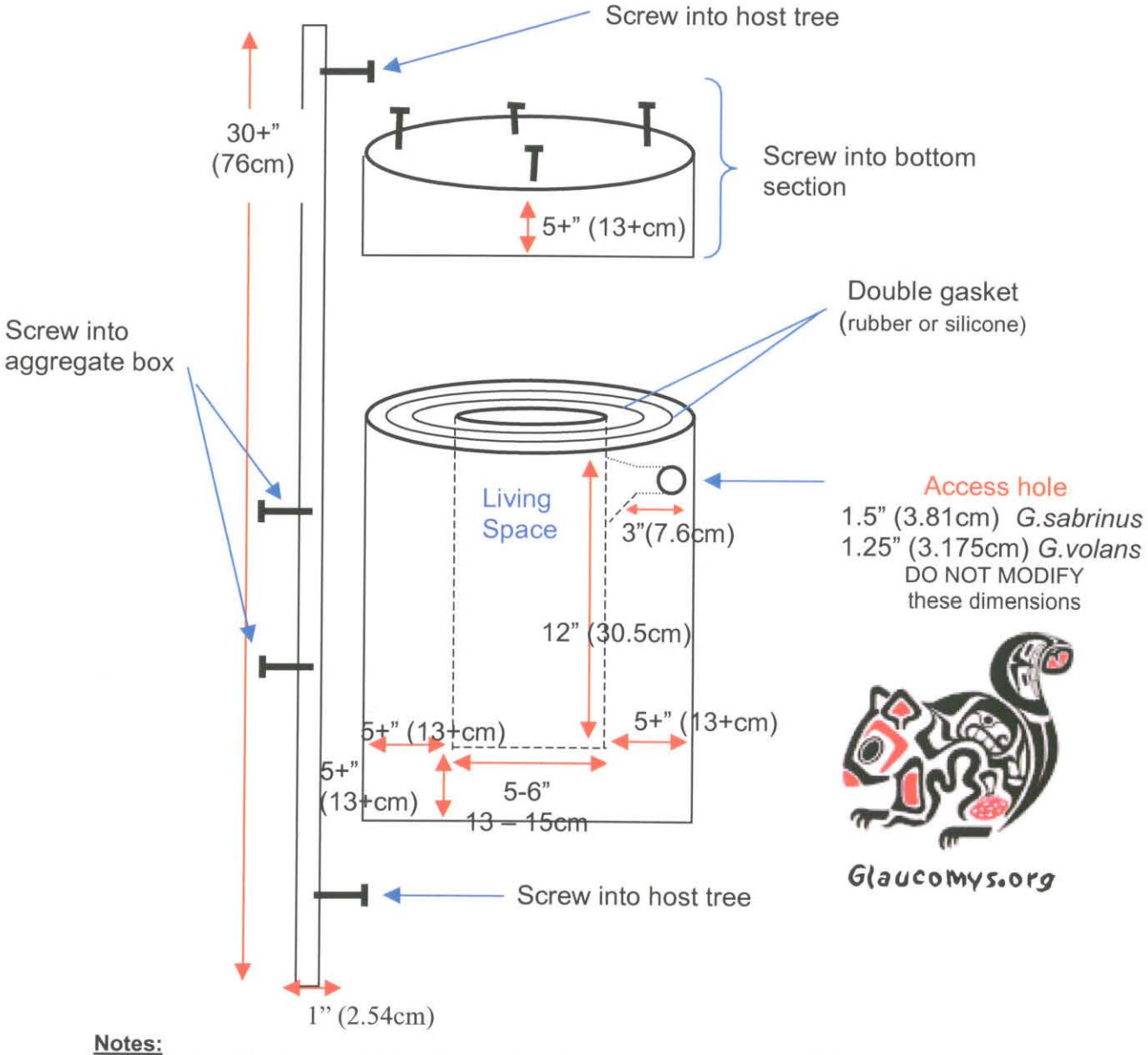
Place nesting boxes in your oldest stands of coniferous (preferred by sabrinus) or mixed forest. Min./Max. placement height is 10'/26' (3m/8m). Place so that access hole faces opposite prevailing wind. Preferably, place so that mammalian predators cannot reach box via limbs of other trees. Should arboreal snakes inhabit the area, drill another access hole at bottom of opposite side. Install within 500m of water (marsh, creek, etc.) or in mesic (wet) forest areas where possible. Install several boxes per 1/2 hectare, as flying squirrels need to have alternate nesting sites available to them for predator/parasite avoidance and rest/elimination purposes.

Monitor occasionally for occupancy by rapping or scratching tree trunk and watching access hole. If you find a flying squirrel has taken up residence, leave it alone. If you bother it too much, it will leave.

The most important feature of your nesting box is that it be waterproof. Please ensure that the inside of the nesting box will remain dry. DO NOT install any nesting boxes if you are aware of house cats (cared-for or feral) in the vicinity.

**BUILDING, PLACING AND CLEANING OF NESTING BOXES CAN BE DANGEROUS.
ALL WORK DETAILED HERE SHOULD BE PERFORMED ONLY UNDER ADULT SUPERVISION.**

Flying Squirrel Aggregate Box Plans



Notes:

1. Unit is made from one section of log, nominally 22" (56cm) in length, 16" (40.5cm) dia.
2. Dimensions given (except access hole diameters) are approximate and are dependant upon source log dimensions - use as a guide only.
3. Softwoods are easier to work with (building and placing). Use chainsaw to create living space. Leave bark on unit, if possible. If not, roughen exterior surface.
4. Place unit between 10' (3m) and 20' (6m) high, away from branches of other trees.
5. Place unit so that entrance hole faces away from prevailing wind.
6. Place unit so that entrance hole faces away from direct sunlight.
7. Clean unit yearly (when unoccupied - watch for active bumblebee and hornet nests!).
8. All screws should be non-rusting; countersunk, Robertson type preferred.
9. Avoid using plywood as backing board; if unavoidable, use exterior grade plywood.

B.4 - Southwestern Willow Flycatcher Focused Survey Report (Michael Brandman Associates, August 2007)

SOUTHWESTERN WILLOW FLYCATCHER FOCUSED SURVEY REPORT MOONCAMP PROJECT, FAWNSKIN, SAN BERNARDINO COUNTY, CALIFORNIA

Prepared for:

County of San Bernardino
Department of Land Use Services
385 N. Arrowhead Avenue, First Floor
San Bernardino, California 92415-0182

Contact: Matthew W. Slowick, Senior Planner

Prepared by:

Michael Brandman Associates
621 E. Carnegie Drive, Suite 100
San Bernardino, California 92408
909.884.2255

Contact: Mikael Romich, Project Biologist

August 15, 2007

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SECTION 1: SUMMARY

This report contains the findings of Michael Brandman Associates (MBA) focused survey for the southwestern willow flycatcher (*Empidonax traillii extimus*) (SWF) on an approximately 62.5-acre property known as Tentative Tract 16136 (Moon Camp) located in the Community of Fawnskin, San Bernardino County, California. This focused survey determined that the project site is not currently occupied by SWF. However, due to various bird species utilizing the site for nesting, project-related tree removal should occur outside the nesting season (March through July).

SECTION 2: INTRODUCTION

At the request of San Bernardino County, MBA conducted a focused SWF survey consistent with accepted survey protocols issued by the US Fish and Wildlife Service (USFWS 2000) for a 62.5-acre property located in the Community of Fawnskin, San Bernardino County, California. This property is hereinafter referred to as project site or site.

2.1 - Project Location

The project site is located in the San Bernardino National Forest, north of Big Bear Lake. State Highway 38 bisects the site on the southern portion. The project site is located south of Flicker Road, east of Oriole Lane, and west of Polique Canyon Road, in the unincorporated community of Fawnskin, San Bernardino County, California (Exhibits 1 and 2). The site consists of Assessor's Parcel Numbers 0304-082-04, 0304-091-12, -13, and -21. It is within sections 7 and 12, Township 2 North and Range 1 East of the Fawnskin U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Exhibit 3).

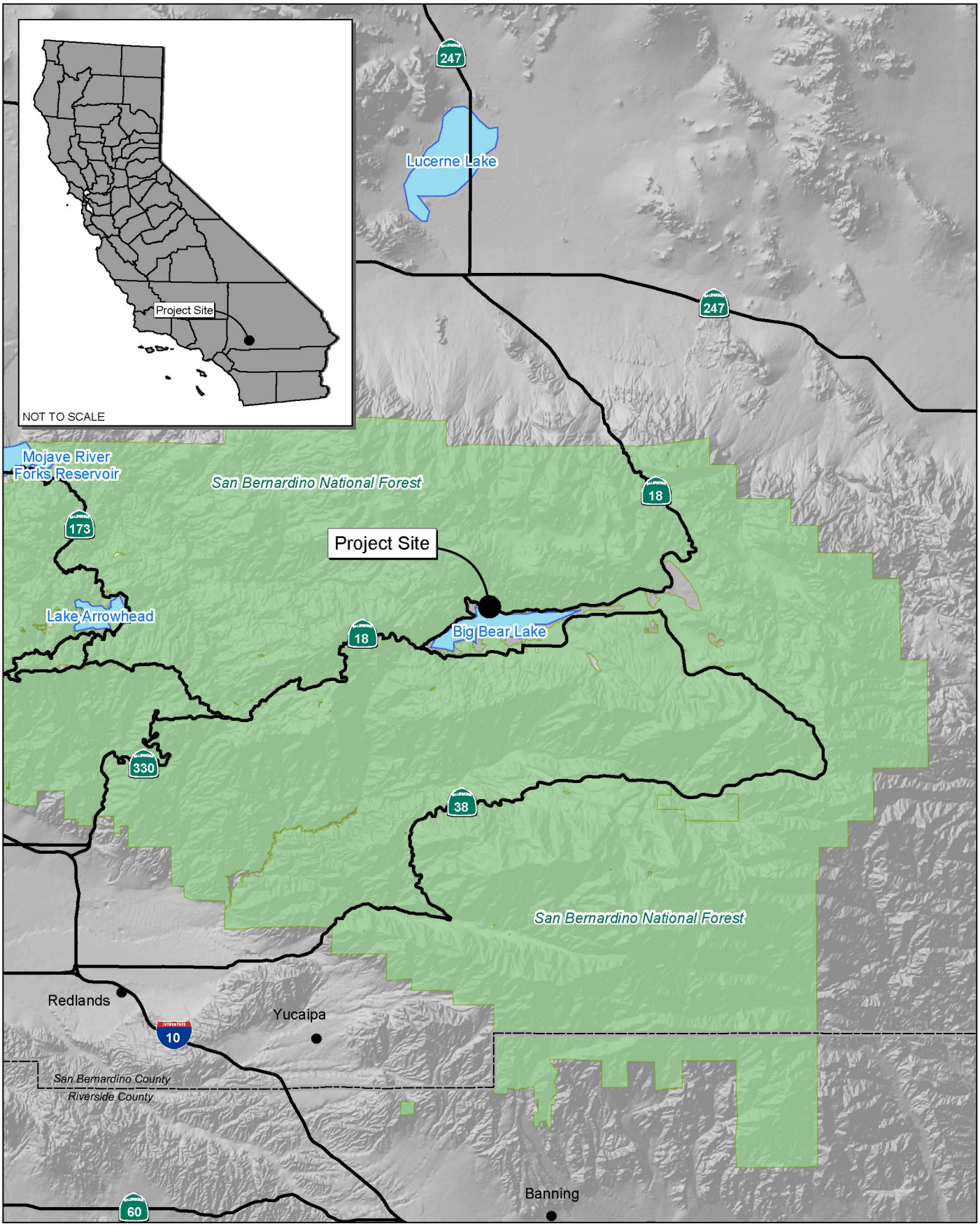
2.2 - Project Description

The proposed project is to subdivide the site into 53 lots: fifty residential lots to be sold individually and developed into custom homes and 3 lettered lots, two of which would be designated as Open Space/Conservation easements.

2.3 - Environmental setting

In addition to SR 38, several dirt roads and trails traverse the project site. Site elevations range from approximately 6,747 feet above mean sea level (msl) at the lakeshore to 6,960 feet above msl at the northeast corner of the site. Individual slopes on-site range from five percent to forty percent. Slope orientation is generally from north to south toward the lake, except for three natural ravines on the project site that contain eastern and western slopes.

The dominant plant community observed on the project site is Jeffrey pine forest (54.91 acres), which includes Jeffrey pine (*Pinus jeffreyi*), white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak occurring at lower densities. The Jeffrey pine forest onsite is unevenly aged composed of approximately 85 percent Jeffrey pine, eight percent western juniper, six percent singleleaf pinyon pine, and less than one percent of scattered white fir and black oak. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), Greg's ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl leaf mountain mahogany (*Cercocarpus ledifolius*).



Source: Census 2000 Data, The CaSIL, MBA GIS 2007.

Michael Brandman Associates

NORTH

5 2.5 0 5 Miles

Exhibit 1
Regional Location Map

Source: TOPO! USGS Fawnskin (1996) 7.5' DRG.

Exhibit 2
Local Vicinity
Topographic Base

NORTH

2,000 1,000 0 2,000 Feet

Michael Brandman Associates

00520089 • 08/2007 | 2_local_topo.mxd

TT 16136 • FAWSKIN, SAN BERNARDINO COUNTY, CA
SOUTHWESTERN WILLOW FLYCATCHER FOCUSED SURVEY REPORT

Source: National Agriculutre Imagery Program, San Bernardino County (2005).

Michael Brandman Associates

NORTH

2,000 1,000 0 2,000

Feet

Exhibit 3
Local Vicinity Aerial Base

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TT 16136 • FAWSKIN, SAN BERNARDINO COUNTY, CA
SOUTHWESTERN WILLOW FLYCATCHER FOCUSED SURVEY REPORT

Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches. Approximately 17.38 acres of the Jeffrey pine forest on the project site contain few trees and fairly open canopy. The open Jeffrey pine forest and where Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*) occur is suitable habitat for a number of sensitive plant species.

The pebble plain plant community occurs on 0.69 acre of the project site north of State Highway 38. It appears as a distinct open patch within open Jeffrey pine forest in the western portion of the Project site. The substrate in this area consists of clay soil mixed with quartzite pebbles and gravel that are continually pushed to the surface through frost action. This substrate supports a high floristic diversity consisting of small cushion-forming plants, tiny annuals, grasses, and succulents that are well spaced, low growing, and sun tolerant. Several sensitive plant species are associated with pebble plain habitat.

Approximately 4.14 acres of the southern boundary of the project site is formed by the shore of Big Bear Lake. Plant species along the shore itself consist primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Vegetation is patchy above the high-water level where small areas of Jeffrey pine forest are interspersed among open meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laviegata*). This plant community provided the only potentially suitable habitat on the project site for southwestern willow flycatcher.

2.4 - Disturbances

Recent activity on the project site includes the removal of trees, which appeared to be either taken off-site or chipped onsite. The greatest disturbance from the tree removal activity would be to cavity-dwelling birds and mammals, and sensitive plant species that have been located on the project site, including the Federally-listed Threatened and California Native Plant Society (CNPS) List 1B species, ash-gray Indian paintbrush (*Castilleja cinerea*); and three CNPS List 1B species, Parish's rock cress (*Arabis parishii*), Big Bear Valley woollypod (*Astragalus leucolobus*), and silver-haired ivesia (*Ivesia argyrocoma*). It is not known if precautions prior to tree removal were made to avoid the known locations of these plants. In addition, the ingress and egress of vehicles involved in the tree removal and the potential dragging of trees offsite has caused the understory vegetation and ground to be heavily disturbed. Finally, there appeared to be direct mechanical removal of some understory shrubs. A number of wildlife trees (or snags) were marked with "WL" and were not removed. Some thinning of trees, including black oak (*Quercus kellogii*), was evident, particularly at the lower portions of the tree trunk.

2.5 - Southwestern Willow Flycatcher

The SWF is an insectivorous migratory songbird that nests during the late spring and summer months in dense riparian habitats. The SWF is one of four subspecies of willow flycatcher (WIFL) that occupy relatively distinct breeding ranges in the continental United States. The breeding range of the SWF occurs in the southwestern region of the states (primarily southern California, Arizona, New Mexico, and portions of Nevada, Utah, and Colorado). SWF breeds in dense riparian vegetation near surface water or saturated soil. The other subspecies of WIFL may nest in shrubby habitats away from water. Habitat loss and brood parasitism by the brown-headed cowbird have been attributed to the decline of this species. The SWF is listed as an endangered species by the State of California (2000) and USFWS (1995). The nearest citing of southwestern willow flycatcher occurred in 2001 on Big Bear Lake in the vicinity of Boulder Bay and Metcalf Bay, California Natural Diversity Database (CNDDB 2007). The project site does not overlap designated critical habitat for SWF (USFWS 2005).

SECTION 3: METHODOLOGY

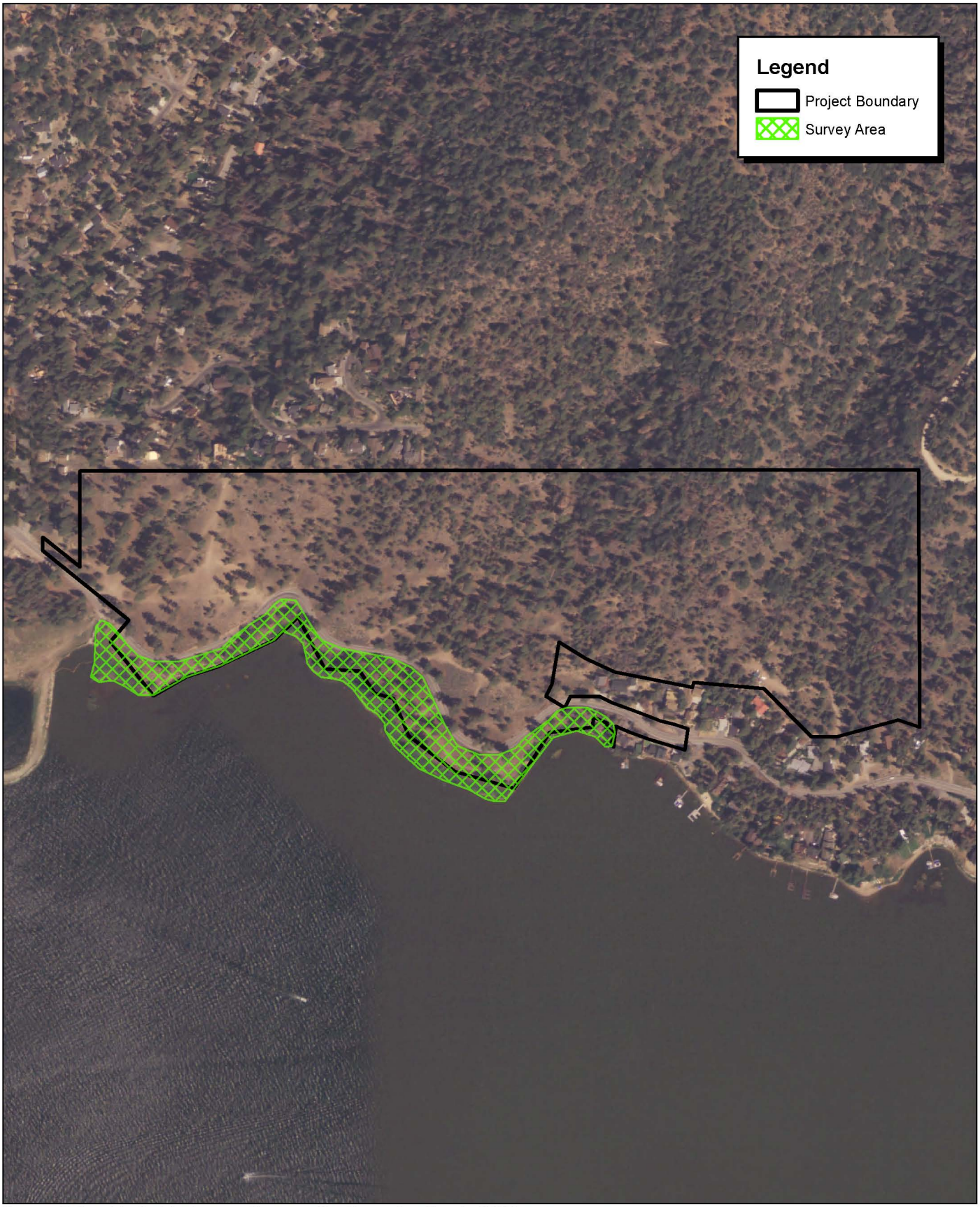
Michael Brandman Associates (MBA) permitted biologist Mikael Romich (TE068799-2) conducted the SWF surveys according to USFWS survey guidelines. To determine the presence/absence of SWF, surveys were conducted within all suitable and potential habitats on the project site. All suitable habitat (see Exhibit 4) occurs along the lakeshore and was surveyed as noted below in Table 1.

Southwestern willow flycatcher protocol requires a total of five (5) surveys between May 15 and July 17. One survey is completed May 15 to May 31; the second survey is completed June 1 to June 21; and three surveys are completed June 22 to July 17. These methods are consistent with the USFWS southwestern willow flycatcher protocol revision (2000). Surveys may begin at dawn and end at approximately 10:30 a.m, as consistent with the SWF protocol developed by Sogge *et al.* (1997).

The surveying biologist methodically moved through the survey area and, when feasible and appropriate, walked within potential habitat patches. The survey protocol included the use of taped recordings of SWF played approximately every 50 feet to elicit responses. If a flycatcher was detected, tape playing was discontinued. All bird species observed during the surveys were noted and are listed in Appendix A. Table 1 summarizes the dates, times, and weather conditions of all SWF surveys.

Table 1: Summary of 2007 SWF Surveys at the Moon Camp Project Site

2007 Date Surveyed	Time	Temperature, wind	Weather
May 31	6:00-8:00	35 F, calm	clear
June 13	7:30-9:00	46 F, calm	clear
June 24	6:30-8:00	42 F, calm	clear
July 3	6:00-7:30	43 F, calm	clear
July 13	5:45-7:15	40 F, calm	clear



Source: National Agriculutre Imagery Program, San Bernardino County (2005).

Michael Brandman Associates

NORTH

500 250 0 500

Feet

Exhibit 4
Focused Survey Area

SECTION 4: RESULTS AND DISCUSSION

4.1 - Southwestern Willow Flycatcher

No detections of SWF or WIFL occurred during the surveys at the Moon Camp project site. In fact, there were no detections of even common riparian obligate species. The lack of riparian bird species suggests that the habitat is not suitable to SWF. In general, the willows along the shoreline are patchy and lack the dense growth or willow thicket favored by this species. In addition, there is little vertical complexity to the riparian habitat on the project site.

4.2 - Bald Eagle

Although not the focus of this survey effort, a sighting of bald eagle (*Haliaeetus leucocephalus*) occurred on June 13, 2007 where an adult was observed flying along the shoreline of the project site in an east to west direction. Bald eagles have recently been delisted as a federally threatened and endangered species by the USFWS (July 9, 2007), but remain a California state endangered species. Bald eagles are known to winter on the project site (Bon Terra Consulting 2002), but breeding records in the Big Bear Lake area are scarce. However, in 2007 two bald eagle nests with potentially two pair of bald eagles were located in the Big Bear Lake area (Forest Service, June 25, 2007). One of these nests was located near Grout Bay, which is just west of the project site. Considering the amount of bald eagle use the project site receives during the winter, it would be conceivable that a nest could be established in one of the larger snags located in the interior of the site, which also affords a view of Big Bear Lake. Future studies should include nesting bald eagle surveys of the project site to ensure they have not established a nest onsite. The two nests in 2007 were discovered on February 9 and April 19, respectively. Copulation between two of the eagles was observed on March 5 and March 12. Therefore, nesting visits should be conducted in March, April, and May to confirm the continued absence of nesting bald eagle on the project site.

SECTION 5: CONCLUSION

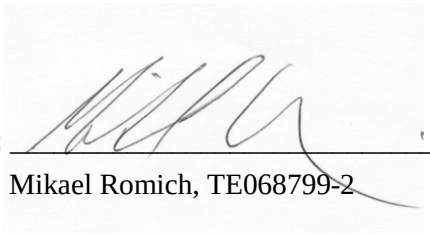
No SWF were detected during this focused survey effort and the site is not occupied by this species. Future short-term occupation of the project site by SWF is unlikely due to the general absence of suitable habitat for this species. Additional focused surveys would not be required unless the habitat becomes more suitable for this species. No impacts to SWF would occur with implementation of the proposed project.

A bald eagle was observed flying over the southern portion of the project site. Due to nesting records from 2007 in the Big Bear Lake area, nesting surveys should be conducted in March, April, and May to confirm the continued absence of nesting bald eagle on the project site.

There are a large number of bird species that were observed to use the project site for nesting. Due to the difficulty locating nests of cavity-nesting and other species of birds, a preconstruction nesting bird survey is not feasible. Therefore, the project should time tree removal to occur outside of the nesting period for birds, generally February through July.

SECTION 6: CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: August 15, 2007 Signed: 

Mikael Romich, TE068799-2

SECTION 7: LITERATURE CITED

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Appendix A: Avian Species List

APPENDIX A
AVIAN SPECIES LIST

Family/Species Name	Common Name
BIRDS	
Gaviidae	**Divers, Loons**
Gavia immer	common loon
Podicipedidae	**Grebes**
Aechmophorus occidentalis	western grebe
Podiceps nigricollis	eared grebe
Podilymbus podiceps	pie-billed grebe
Ardeidae	**Egrets, Herons & Bitterns**
Ardea herodias	great blue heron
Anatidae	**Swans, Geese & Ducks**
Aix sponsa	wood duck
Anas platyrhynchos	mallard
Anas strepera	gadwall
Rallidae	**Rails and Coots**
Fulica americana	American Coot
Accipitridae	**Kites, Hawks, Eagles & Vultures**
Buteo lineatus	red-shouldered hawk
Haliaeetus leucocephalus	bald eagle
Falconidae	**Falcons**
Falco sparverius	American kestrel
Ciconiidae	**American Vultures**
Cathartes aura	turkey vulture
Phasianidae	**Pheasants, Partridges & Quail**
Oreortyx pictus	mountain quail
Scolopacidae	**Sandpipers**
Actitis macularia	spotted sandpiper
Charadriidae	**Plovers**
Charadrius vociferus	killdeer
Columbidae	**Pigeons & Doves**
Zenaida macroura	mourning dove
Picidae	**Woodpeckers**
Colaptes auratus	northern flicker
Melanerpes formicivorus	acorn woodpecker
Picoides pubescens	downy woodpecker
Picoides villosus	hairy woodpecker

Family/Species Name	Common Name
Tyrannidae	**Tyrant Flycatchers**
Contopus sordidulus	western wood-peewee
Hirundinidae	**Swallows**
Tachycineta thalassina	violet-green swallow
Corvidae	**Crows, Jays**
Corvus corax	common raven
Cyanocitta stelleri	Steller's jay
Paridae	**Titmice**
Poecile gambeli	mountain chickadee
Aegithalidae	**Bushtit**
Psaltriparus minimus	common bushtit
Sittidae	**Nuthatches**
Sitta pygmaea	pygmy nuthatch
Troglodytidae	**Wrens**
Thryomanes bewickii	Bewick's wren
Turdidae	**Thrushes**
Turdus migratorius	American robin
Sialia mexicana	western bluebird
Sturnidae	**Starlings**
**Sturnus vulgaris*	European starling
Vireonidae	**Vireos**
Vireo cassinii	Cassin's vireo
Fringillidae	**Finches, Grosbeaks, Sparrows**
Agelaius phoeniceus	red-winged blackbird
Carpodacus mexicanus	house finch
Euphagus cyanocephalus	Brewer's blackbird
Junco hyemalis	dark-eyed junco
Pipilo chlorurus	green-tailed towhee
Pipilo erythrophthalmus	spotted towhee
Spizella passerina	chipping sparrow

B.5 - Peer Review of Existing Biological Documents (Michael Brandman Associates, January 2007

Michael Brandman Associates

ENVIRONMENTAL SERVICES • PLANNING • NATURAL RESOURCES MANAGEMENT

January 31, 2007

Matthew W. Slowick, Senior Associate Planner
County of San Bernardino Land Use Services Dept.
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Subject: Site Assessment and Review of Previously Prepared Biological Documentation of the Proposed Moon Camp Tentative Tract (TT) 16136 Project Site near Fawnskin, San Bernardino County, California

Dear **Mr**. Slowick:

The following is the results of a field assessment and peer review of existing biological documents for the Moon Camp TT 16136 project near Fawnskin in San Bernardino County.

Introduction

As requested by the County of San Bernardino, Michael Brandman Associates (MBA) completed a professional peer review of biological investigations and previously prepared biological documents concerning the approximately 64-acre subject property, known as the Moon Camp TT 16136 in San Bernardino County, California. The purpose of this task was to confirm that the appropriate professional practices were observed and to identify any deficiencies of information that could affect the adequacy of the environmental impact report we are preparing for this project.

Biological studies of the site were conducted by Bonterra Consulting in 2002. An EIR was prepared by RBF Consulting in December 2005.

The following documents were reviewed for consistency with the current conditions of the site as well as for determining the need for additional studies:

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- *Results of Botanical Surveys on Moon Camp- Tentative Tract 16136, Unincorporated San Bernardino County, California*. BonTerra Consulting. December 17, 2002.
- *Results of Rubber Boa Surveys on Moon Cam-Tentative Tract 16136, Unincorporated San Bernardino County, California*. BonTerra Consulting. December 5, 2002.
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- *Results of Spotted Owl Surveys on Moon Camp Tentative Tract 16136, Unincorporated San Bernardino County, California*. BonTerra Consulting. August 23, 2002.

- *Moon Camp-Tentative Tract 16136 Draft Biological Technical Report*. BonTerra Consulting. July 9, 2003.

MBA's review methods, findings, and recommendations are presented below.

Methodology

After reviewing the reports listed above, along with a copy of the proposed tentative tract map, MBA biologist Marnie McKernan conducted a field survey of the site on December 15, 2006. The site was surveyed by vehicle and on foot. The survey was completed to verify conditions at the project site, evaluate habitat for suitability for sensitive species and to better understand potential impacts of the proposed project. The visit was not intended as a focused survey or a comprehensive inventory of the site.

Findings

Habitat Assessment and Peer Review

The site occurs on the north shore of Big Bear Lake near the community of Fawnskin. The project site sits on a south facing slope with an elevation ranging from 6,745 feet above mean sea level (msl) at the shoreline to 6,982 feet msl at the northern boundary.

The biological conditions at the site in December 2006 were consistent with the findings of the 2002 and 2003 reports prepared by BonTerra Consulting. In general, the site has remained undisturbed since the reports were prepared and still reflects the conditions outlined in those studies. The only noticeable physical change to the site is to the continued growth of the willow scrub habitat along the shoreline.

Based on MBA's field observations, we have determined that the previous BonTerra investigations accurately described the vegetation communities found onsite, and accurately identified the species of concern that are known or likely to occur within the habitats found onsite.

MBA concurs with the list of species determined to have a moderate potential to occur on the project site. One additional species that MBA recommends including on the list is the San Bernardino flying squirrel. This species is a State and San Bernardino National Forest (SBNF) Species of Special Concern. During the site assessment, MBA determined that the northern half of the site supports habitat suitable for this species. In researching this species, MBA learned that trapping efforts in 1991 for the flying squirrel by Forest Service biologists in the Fawnskin area showed a relatively high success rate (Butler et al. 1991).

Bald Eagle

The focused bald eagle survey and report by BonnTerra concluded that the project site and vicinity (Grout Bay) are very important to wintering populations of bald eagles. In fact, the report goes on to point out that one particular perch tree onsite is considered the most commonly recorded used perch tree on the north shore of Big Bear Lake. A review of several years of wintering bald eagle counts conducted by the SBNF and volunteers in the Big Bear Valley confirm that wintering bald eagles routinely use the Moon Camp site for perching.

The BonnTerra report indicated that the project site contains several perch trees used by the eagles which are primarily located adjacent to the shoreline and within 100 feet north and south of the highway. After making a site visit and consulting with a Forest Service biologist knowledgeable with the populations of bald eagle in the Big Bear Basin, MBA concluded that the entire project site likely provides suitable perch

trees for the bald eagle. Because the site is located on a moderately steep hill, the trees along the project's northern boundary provide perches with a lake view, one of the requirements of bald eagle perch trees. During the site visit, the MBA biologist, as well as the Forest Service biologist, observed a juvenile bald eagle perched in a tree on the northeast corner of the site.

The BonnTerra report recommended that all known perch trees, and those greater than 20 inches in diameter at 4 feet from the ground and within approximately 200 yards of the high water line, be avoided during construction and preserved in place. This recommendation was used as mitigation in the Draft EIR. This may conflict with the general rule of Caltrans, San Bernardino County and other agencies with jurisdiction in this immediate area to cut down large trees within falling distance to the highway, homes or any structure if there is obvious sign of dying (such as limb loss) to prevent damage to property or life. Many of the perch trees onsite are in the process of dying and their removal could be considered detrimental to the biological value of this area and to the bald eagle.

Because the data documenting the use of the Moon Camp site are fairly robust (SBNF, BonnTerra, and others), additional focused surveys are not recommended.

Sensitive Plants

The focused botanical survey was conducted in May and June of 2002 and a follow up survey in November 2002. Results of the survey indicate that that five special status plant species and one special status vegetation community occur on the project site: Parish's rock-cress (*Arabis parishii*), Big Bear Valley woollypod (*Astragalus leucolobus*), ash-gray Indian paintbrush (*Castilleja cinerea*), Heckards paintbrush (*Castilleja applegateii ssp),*silver-haired ivesia (*Ivesia argyrocoma*), and Pebble Plain. The survey report cautioned however that due to the very dry conditions onsite caused by poor rainfall years, many of the plants with a moderate to high potential to occur onsite could not be conclusively determined to be present or absent from the site during the focused surveys. Additional focused plant surveys are needed to determine whether the following sensitive plants occur onsite.

- Rock sandwort (*Arenaria lanuginosa* ssp. *saxosa*);
- Big Bear Valley sandwort (*Arenaria ursine)*;
- Crested milk-vetch (*Astragalus bicristatus)*;
- Big Bear Valley milk-vetch (*Astragalus lentiginosus* var. *Sierrae*;
- Palmer's mariposa lily (*Calochortus palmeri* var. *Palmeri*);
- San Bernardino Mountain owl's clover (*Castilleja lasiorhyncha)*;
- San Bernardino Mountains dudleya (*Dudleya abramsii* ssp. *affinis*);
- Leafy buckwheat (*Eriogonum foliosum*);
- Jepson's bedstraw (*Galium jepsonii*);
- Johnston's bedstraw (*Galium johnsttonii*);
- Duran's rush (*Juncus duranii*);
- Short-sepaled lewisia (*Lewisia brachycalyx*);
- Baldwin Lake linanthus (*Linanthus killipii*);
- San Bernardino Mountain monkeyflower (*Mimulus exiguous*);
- Purple monkeyflower (*Mimulus purpureus* var. *purpureus*);
- Chickweed oxytheca (*Oxytheca caryophylloides*);
- Parish's yampah (*Perideridia parishii* ssp. *parishii*);
- Transverse Range phacelia (*Phacelia exilis*);

- Mojave phacelia (*Phacelia mohavensis*);
- Bear Valley phlox (*Phlox dolichantha*);
- San Bernardino bluegrass (*Poa atropurpurea*);
- Bear Valley pyrrocoma (*Pyrrocoma uniflora* ssp. *Gossypina*);
- Parish's rupertia (*Rupertia rigida*);
- Bird's foot checkerbloom (*Sidalcea pedata*);
- Prairie wedge grass (*Sphenopholis obtusata*);
- Laguna Mountains jewelflower (*Streptanthus bernardinus*);
- Southern jewelflower (*Streptanthus campestris*);
- Pine green-gentian (*Swertia neglecta*);
- California dandelion (*Taraxacum californicum*); and
- Small-flowered bluecurls (*Trichostema micranthum*).

Two separate days of surveying are recommended; one during the height of flowering and one near the end to capture the full extent of the blooming period

Southern Rubber Boa

Focused southern rubber boa (SRB) surveys were conducted in the suitable habitat within the eastern portion of the Moon Camp project site during May-August 2002 with negative results. The report by BonnTerra concluded that the SRB is not expected to occur onsite for three reasons; because of the negative results of their focused surveys, the lack of historical records for the immediate project area and the lack of rock outcrops that appear to be an important component of occupied habitat.

The draft survey guidelines developed by the CDFG for SRB includes three years of repeated intensive active searches before determination of absence can be made. Intensive active searches of suitable habitat for SRB are similar to the visual encounter survey method described by Crump and Scott (1994) in which a subsample of sites exhibiting high value habitat within the site as a whole are surveyed intensively for presence. The draft guidelines allow for negative finding in less than 3 years (2 years) if trapping is conducted. Trapping consists of the use of a system of pitfall traps connected to drift fences, known as arrays, to capture SRB.

The BonTerra focused surveys consisted of a combination of both survey techniques conducted simultaneously to maximize the probability of detecting SRB. Because the surveys were conducted for just the one season, the negative results cannot conclusively determine that SRB are absent from the project site. MBA concluded during their December assessment that the eastern portion of the Moon Camp site contains suitable habitat (well-developed soils, leaf litter accumulation, downed logs, and large rocks) for SRB. An additional habitat assessment and/or SRB focused surveys are needed to adequately characterize this species' presence or absence from the project site.

Southwestern Willow Flycatcher

Focused willow flycatcher surveys were conducted for the Moon Camp project during the breeding season of 2002 according to the USFWS protocol (USFWS 1997, revised 2000). The surveys were conducted on five separate days between May and July. Surveys were conducted in the willow habitat along the shoreline at the southern edge of the project site. Results of the surveys were negative. The focused survey report concluded that the site did not contain suitable territorial or breeding habitat since "the willows are patchy and lack the dense growth or willow thicket required by the SWF." Focused

surveys for SWF were conducted 5 years ago. Since that time, the willow habitat onsite has grown and matured, thereby providing better opportunities for the SWF to occupy the site. Focused SWF surveys are recommended to determine their presence/absence from the Moon Camp site.

Spotted Owl

Focused surveys for the spotted owl were conducted on the Moon Camp project site and adjacent areas during the breeding season of 2002. Surveys were conducted at night on six occasions by walking predetermined survey routes designed to provide thorough survey coverage of the area. No spotted owls were detected onsite during the focused surveys. One male spotted owl was detected and later observed at its roost approximately 1 mile from the Moon Camp project site during the surveys. In discussions with a Forest Service biologist concerning the need for additional spotted owl surveys, MBA learned that the SBNF has been conducting surveys for spotted owl throughout the forest, including the immediate vicinity of Moon Camp. No known spotted owl nest, home range or activity center occurs on the Moon Camp site. Enough information on this species and their locations is available and is annually updated by the SBNF. Additional surveys for the spotted owl are not needed.

Recommendations

The following additional focused surveys are recommended for the Moon Camp TT 16136 project site for the 2007 survey season.

- San Bernardino flying squirrel;
- Southwestern willow flycatcher;
- Southern rubber boa; and
- Sensitive plants.

Should you have any further questions regarding this project please do not hesitate to contact me at (909) 884-2255.

Sincerely,

Marnie McKernan

Marnie McKernan, Project Manager/Biologist
Michael Brandman Associates
621 E. Carnegie Drive, Suite 100
San Bernardino, CA 92408

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B.6 - Peer Review of Existing Biological Documents (Michael Brandman Associates, February 2007

Michael Brandman Associates

ENVIRONMENTAL SERVICES • PLANNING • NATURAL RESOURCES MANAGEMENT

February 7, 2007

Matthew W. Slowick, Senior Associate Planner
County of San Bernardino Land Use Services Dept.
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Subject: Site Assessment and Review of Previously Prepared Biological Documentation of the Proposed Moon Camp Tentative Tract (TT) 16136 Project Site near Fawnskin, San Bernardino County, California

Dear **Mr**. Slowick:

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surveys for SWF were conducted 5 years ago. Since that time, the willow habitat onsite has grown and matured, thereby providing better opportunities for the SWF to occupy the site. Focused SWF surveys are recommended to determine their presence/absence from the Moon Camp site.

Spotted Owl

Focused surveys for the spotted owl were conducted on the Moon Camp project site and adjacent areas during the breeding season of 2002. Surveys were conducted at night on six occasions by walking predetermined survey routes designed to provide thorough survey coverage of the area. No spotted owls were detected onsite during the focused surveys. One male spotted owl was detected and later observed at its roost approximately 1 mile from the Moon Camp project site during the surveys. In discussions with a Forest Service biologist concerning the need for additional spotted owl surveys, MBA learned that the SBNF has been conducting surveys for spotted owl throughout the forest, including the immediate vicinity of Moon Camp. No known spotted owl nest, home range or activity center occurs on the Moon Camp site. Enough information on this species and its locations is available and is annually updated by the SBNF. Additional surveys for the spotted owl are not needed.

Recommendations

The following additional focused surveys are recommended for the Moon Camp TT 16136 project site for the 2007 survey season.

- San Bernardino flying squirrel;
- Southwestern willow flycatcher;
- Southern rubber boa; and
- Sensitive plants.

Should you have any further questions regarding this project please do not hesitate to contact me at (909) 884-2255.

Sincerely,

Marnie McKernan

Marnie McKernan, Project Manager/Biologist
Michael Brandman Associates
621 E. Carnegie Drive, Suite 100
San Bernardino, CA 92408

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B.7 - Draft Vegetation and Special Status Plants Survey (Scott White Biological Consulting, August 2007)

MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

PRELIMINARY DRAFT: August 2007

Prepared for:
Michael Brandman Associates
621 E. Carnegie Dr., Suite 100
San Bernardino, CA 92408

Prepared by:
Scott D. White
SCOTT WHITE BIOLOGICAL CONSULTING
201 North First Ave., No. 102
Upland, CA 91786

Project site location: USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1 West, portion of Section 13.
APN:
Owner /Applicant:
Principal Investigator: Scott D. White, Scott White Biological consulting (above).

CERTIFICATION: I hereby certify that the statements furnished in this report and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me and under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.

DRAFT REPORT ONLY

DATE: _____ SIGNED: _____
Scott D. White, Report Author

Additional field work performed by:

DATE: _____ SIGNED: _____
Justin Wood

MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

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MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

Scott D. White
SCOTT WHITE BIOLOGICAL CONSULTING
PRELIMINARY DRAFT: July 2007

I: SUMMARY

The Moon Camp property supports two sensitive plant communities (Pebble Plain and meadow habitats), one federally listed plant species (ash-gray Indian paintbrush) and four State Species of Special Concern (Parish's rock-cress, Big Bear Valley woollypod, Heckard's paintbrush, and silver-haired ivesia). Project development is expected to have both direct and indirect impacts to these sensitive biological resources. Several recommendations are discussed to minimize these impacts.

II: PROJECT AND PROPERTY DESCRIPTION

The San Bernardino County Planning Department is reviewing an application for residential development on the former Moon Camp site in Fawnskin. The project site is on the north shore of Big Bear Lake, in the eastern part of Fawnskin, in unincorporated San Bernardino County. It is about 62 acres, on both sides of State Highway 38, between Oriole Lane and Polique Canyon Road (on the Fawnskin USGS 7½' quadrangle map, in the north half of Section 13, Township 2N and Range 1W). The project site slopes from north to south. Elevation ranges from 6,960 feet in the northeastern portion of the site to 6,750 feet near the lakeshore (see Exhibits 1 and 2).

The project site occurs within an area that is described by the Open Space element of San Bernardino County's General Plan as, "This area includes the entire watershed area of Big Bear Lake, and contains a number of specialized habitat areas, which support a large number of endangered plants and animals (as well as commonly occurring mountain species). Habitat values here should be maintained, potentially by controlling development to prevent damage to important habitat areas."

This report addresses the potential presence of twp special status plant communities and several sensitive plant species occurring or potentially occurring on the property.

III. FOCUSED STUDY / SPECIES OF CONCERN

There are four federally listed threatened or endangered plant species endemic to meadows and three federally listed threatened or endangered plant species endemic to "pebble plain" habitat in the Big Bear Valley area of the northern San Bernardino Mountains (USDI Fish and Wildlife Service 1984, 1998). In addition, there are numerous other special status plant species occurring in this area (Appendix 2). This report focuses on the following plant species:

Exhibit 1: TBD

Exhibit 2: TBD

Meadow Species:

- San Bernardino bluegrass (*Poa atropurpurea*) (federally endangered);
- Bird-foot checkerbloom (*Sidalcea pedata*) (federally and state endangered);
- California dandelion (*Taraxacum californicum*) (federally endangered); and
- Slender-petaled thelypodium (*Thelypodium stenopetalum*) (federally endangered).

Pebble Plain Species:

- Bear Valley sandwort (*Arenaria ursina*) (federally threatened);
- Ash-gray Indian paintbrush (*Castilleja cinerea*) (federally threatened); and
- Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*) (federally threatened).

Previous surveys of the Project Site identified ash-gray Indian paintbrush as present on the site (Michael Brandman Associates 2000; White & Leatherman BioServices 2002). White and Leatherman (2002) also mapped the extent of suitable habitat for ash-gray Indian paintbrush, based on the extent of its host plant, Wright's matting buckwheat. Bear Valley sandwort was reported as occurring on the site in the California Natural Diversity Data Base (California Department of Fish and Game 2007).

IV. METHODS

Available literature relative to special status plants or plant communities known from the project site and vicinity were reviewed. Literature sources included previous biological reports (Michael Brandman Associates 2000; White & Leatherman BioServices 2002), the California Natural Diversity Data Base (California Department of Fish and Game 2007a, USGS Fawnskin, Big Bear City, Big Bear Lake, Butler Peak, Keller Peak, and Moonridge 7½' topographic quads), California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (Tibor 2001), the CNPS *Electronic Inventory* (2007, for the same quads) and compendia of special status species published by the US Fish and Wildlife Service (2006) and California Department of Fish and Game (2007b). All species identified by this literature review, and others known from the general region, are included in Appendix 1 or 2 (attached). Appendix 1 lists those species not considered for this report due to elevational or geographic ranges, or specialized habitat requirements not found on the site. Appendix 2 lists special status species known from comparable habitats in the region and summarizes their natural history, conservation status, and occurrence probability onsite.

Scott D. White and Justin Wood (Scott White Biological Consulting) surveyed pebble plains habitat found on the site on 30 April, 7 June, and 8 August 2007. All plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in Hickman (1993), Munz (1974), Abrams (1923-1960), and other regional references. All species noted on the site are listed in Appendix 3.

Surveys were conducted in conformance with California Department of Fish and Game guidelines (2000), during flowering seasons for the above listed special status plants. It should be noted that very low rainfall in 2006-2007 and surveys may not be conclusive for all annual plants.

Maps produced previously by White and Leatherman BioServices (2002) of the pebble plain habitat and open upland habitat supporting Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*) were used as base maps for this study.

V. RESULTS

Due to the drought conditions, the authors used previous reports and their own judgment of habitat quality to estimate the probability that each special status plant might occur on the site.

A. PLANT COMMUNITIES

The following two plant communities were dominant plant communities found on the site:

Jeffrey Pine Forest

Most of the site above Highway 38 is covered by the Jeffrey pine series (Sawyer and Keeler-Wolf 1995). This vegetation also matches descriptions of Jeffrey pine forest (Holland 1986; McBride 1988), and montane coniferous forest (Munz 1959). Jeffrey pine forest covers most of the eastern half of the project site and occurs in patches interspersed with pebble plains (below) in the western half (see Exhibit 3). Jeffrey pine (*Pinus jeffreyi*) is the dominant tree; white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occur throughout Jeffrey pine forest, at lower densities. The understory is sparse, consisting of scattered shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), cupleaf ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbes in scattered patches. Jeffrey pine forest occurs in mountains throughout most of California at elevations between about 5000 and 9000 feet. Many local and regional associations have been described (Sawyer and Keeler-Wolf 1995).

Shoreline Habitats

Most plants along the shore itself are herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium ciliatum*), wire-grass (*Juncus arcticus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Numerous seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*) also occur there.

Just above the high-water level, there are small patches of various upland and wetland vegetation types. These patches are too small to map. Small areas of Jeffrey pine forest are interspersed open wet meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*). There are no alkaline meadow or dry meadow habitats (below) along the lake shore.

Sensitive Plant Communities

In addition to the above common plant communities, two sensitive plant communities were identified on the project site. Exhibit 3 shows the location of each of these sensitive plant communities.

Exhibit 3: TBD

Pebble Plain Plant Community

Pebble plain plant community occurs on XX acres within the western portion of the site north of Highway 38. This habitat occurs in smaller patches to the east (see Exhibit 3). The Pebble plain plant community (also called pavement plain) was described by Derby and Wilson (1978, 1979). A detailed discussion was prepared by the San Bernardino National Forest (1990) and brief descriptions appear in Holland (1986) and Sawyer and Keeler-Wolf (1995). This plant community is characterized by an underlying layer of clay soil with quartzite pebbles and gravel that are continually pushed to the surface, evidently through frost action (Holland 1986). Vegetation structure on these sites is similar to the mat-forming structure of alpine sites at much higher elevations. Vegetation consists largely of well-spaced cushion-forming perennials and a variety of tiny annuals. Bunchgrasses and some succulents may also occur. At least two species, both listed as endangered, are endemic to the Big Bear pebble plain plant community: Bear Valley sandwort and southern mountain buckwheat (Derby and Wilson 1978).

On the Moon Camp site, much of the pebble plain habitat has been disrupted by vehicle use on the site. This disturbance has reduced vegetation cover, disturbed the natural hydrologic pattern, and perhaps reduced habitat quality for the sensitive pebble plain plant species (San Bernardino National Forest 1990). The Forest Service has determined that vehicle disturbance does not permanently alter habitat suitability for these species. The Forest Service has fenced degraded pebble plains in the Sugarloaf area and found that plant diversity returns after a few years.

The pebble plain plant community onsite has been classified as "southern montane black sagebrush pebble plains" by CDFG (2002). This plant community is "a series or association considered rare and worthy of consideration" by the California Natural Diversity Data Base.

Meadow Habitats

Small patches of dry and wet meadows occur along the lakeshore, south of Highway 38. They grade into upland grasslands, and we could not delineate their extent due to dry conditions. Meadows in the Big Bear Valley may be perennially saturated (i.e., "wet meadows") or may have saturated soils only seasonally or during wet years (called "dry meadows," "xeric meadows," or "vernal meadows"). Meadows of the San Bernardino Mountains were described by Krantz (1994). They are generally dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.) and grasses (*Poa* spp., *Elymus* spp.). Dry meadows and the margins of wet meadows support sagebrush (*Artemisia tridentata, A. rothrockii*). These meadows themselves are not ranked as special status communities by CDFG (2002) but several locally endemic plants occur in them and they, therefore, are recognized locally as important habitats (Krantz, no date).

B. SENSITIVE PLANT AND WILDLIFE SPECIES

Big Bear Valley has a high proportion of rare and locally endemic species (Krantz, no date; Krantz 1994). All of these species are addressed in Appendix 1 or 2 (habitat and range, agency status and probability of occurring on the site). Only those species potentially occurring on the site (see Appendix 2) are discussed below.

Listed Threatened or Endangered Plants Identified on the Site

Ash-gray Indian paintbrush (*Castilleja cinerea*): Ash-gray Indian paintbrush is a federally-listed threatened species and is on CNPS's List 1B. It is a root parasite on other plants, often parasitizing the listed threatened southern Mountain buckwheat (below) or a similar but common mat-forming

buckwheat (*E. wrightii* ssp. *subscaposum*). It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows and seeps, and open pinyon or Jeffrey pine forest between about 5,900 and 10,000 feet elevation. It is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). It was mapped on the project site by Michael Brandman Associates (2000) and in the California Natural Diversity Data Base (2007). This survey confirmed these occurrences and noted no substantial changes to densities or distribution in 2007.

Sensitive Plants Occurring on the Site

Parish's rock-cress (*Arabis parishii*): Parish's rock cress is CNPS's List 1B. It is a perennial herb that typically blooms in April or May. It occurs in pebble plains, and other sites with heavy or rocky soils, including carbonate soils, within pinyon woodlands and montane forests between about 3,900 and 8,000 feet elevation. It is endemic to the San Bernardino Mountains. Suitable habitat occurs on the project site in areas shown on Exhibit 3. This survey confirmed its presence onsite and noted no substantial changes to densities or distribution in 2007.

Big Bear Valley woollypod (*Astragalus leucolobus*): Big Bear Valley woollypod is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in rocky soils of montane conifer forests and woodlands and pebble plains, between about 5,600 and 8,000 feet elevation. It is endemic to the high mountains of southern California (San Bernardino, San Gabriel, San Jacinto, and Santa Rosa Mountains). Suitable habitat is found throughout the site. White & Leatherman BioServices (2002) observed it occasionally throughout the project site. This survey confirmed these occurrences and noted that it was especially common on pebble plains in 2007.

Heckard's paintbrush (*Castilleja montigena, C. applegateii* ssp. *martinii*): Heckard's paintbrush is on CNPS's List 4. It is a perennial herb, typically flowering between May and August. It occurs in montane forests between about 6,400 and 9,200 feet elevation. It is endemic to the San Bernardino Mountains, where it is common in forest habitats throughout the mountain range. It was originally described by Lawrence Heckard (1980), but Heckard regarded it as a minor variant of *Castilleja applegateii* and not as a distinct species in his Jepson Manual treatment of the genus (1993). This survey found it occurring occasionally in Jeffery pine forest on the Moon Camp site.

Silver-Haired Ivesia (*Ivesia argyrocoma*): Silver-haired ivesia is on CNPS's List 1B. It is a perennial herb that typically blooms between June and August. It occurs in alkaline meadows and seeps, pebble plains, and montane forest between about 4900 and 8800 feet elevation. It occurs in the San Bernardino Mountains and a disjunct site in the mountains of Baja California. It was reported on the project site by Michael Brandman Associates (2000) and White and Leatherman BioServices (2002). This survey observed it throughout the pebble plain habitat (Exhibit 3).

Listed and Candidate Threatened or Endangered Plants Potentially Occurring on the Site

Bear Valley sandwort (*Arenaria ursina*): Bear valley sandwort is a federally-listed as threatened and is on CNPS's List 1B. It is a perennial herb and typically blooms from May to August. It occurs in pebble plains and sometimes in carbonate soils, between about 6,400 and 6,900 feet elevation. It is endemic to Big Bear Valley in the San Bernardino Mountains. It has been reported from the Moon Camp site (CNDDB 2007), but was not observed in 2007 nor was it observed by Michael Brandman Associates (2000) or White & Leatherman BioServices (2002). Due to poor rainfall in 2006-07, this survey could not evaluate whether Bear Valley sandwort was present or absent from

the site. Suitable habitat occurs in pebble plains on the project site, and this survey determined that there is a high probability of it occurring onsite.

Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*): Southern mountain buckwheat is federally listed as threatened and is on CNPS's List 1B. It is a mat-forming woody perennial, generally flowering late in the season (between about June and August). It is endemic to pebble plains habitats in Big Bear and Holcomb valleys in the San Bernardino Mountains, between about 5,800 and 7,500 feet elevation. It often serves as a host plant for the hemi-parasitic *Castilleja cinerea* (above) and also is a food plant for a newly described locally-endemic San Bernardino blue butterfly. It is very similar to a more common Wright's matting buckwheat (*E. wrightii* ssp. *subscaposum*), which is common on the project site. The two species are distinguished by presence or absence of branching in their inflorescences (Hickman 1993; Reveal 1989, 2005). We examined flowers and remains of dried inflorescences of mat-forming buckwheats throughout the project site on each site visit. Most of them were either unidentifiable (due to absence of inflorescences) or were identified as Wright's matting buckwheat, based on their branching inflorescences. Within the mapped pebble plain habitat, about 10-20% of the matting buckwheat plants had mostly unbranched inflorescences during the 8 August site visit. Reveal (2005) noted that the two plants intergrade to some extent in Big Bear Valley and A. Sanders (pers. comm.) has made similar observations. It was concluded that some of the matting buckwheats on pebble plains at the Moon Camp site are intergradations between the endangered southern mountain buckwheat and the common Wright's matting buckwheat.

San Bernardino bluegrass (*Poa atropurpurea*): San Bernardino bluegrass is a federally listed endangered species and is on CNPS's List 1B. It is a rhizomatous perennial grass that typically flowers between May and June. It occurs in mesic meadows and seeps between about 4,400 and 8100 feet elevation. It is known only from the San Bernardino Mountains and Laguna mountains (San Diego County). Although marginally suitable habitat occurs along the lakeshore areas on the project site, San Bernardino bluegrass was not observed onsite. Based on habitat, it was concluded there is a low probability that it may occur there.

Bird's foot checkerbloom (*Sidalcea pedata*): Bird's foot checkerbloom is a federally- and state-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in meadows and seeps, between about 5,200 and 8,100 feet elevation. It is endemic to the San Bernardino Mountains. Although marginally suitable habitat occurs near the lakeshore, bird's foot checkerbloom was not observed during field surveys. It was not reported as occurring in previous surveys. Based on habitat, it was concluded that there is a low probability that it may occur.

California dandelion (*Taraxacum californicum*): California dandelion is a federally-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It is endemic to the San Bernardino Mountains, occurring only in and around Big Bear Valley, in meadows and seeps between about 6,300 and 7,800 feet elevation. Although marginally suitable habitat occurs in meadow areas near the lakeshore, the species was not observed during the surveys or reported in prior surveys. Based on habitat, it was conclude that there is a low probability that it may occur onsite.

Sensitive Plants Potentially Occurring Onsite

Although not observed during the survey, the following sensitive plant species were judged as having a moderate or high probability of occurring onsite:

Table 1
Sensitive Plant Species Having a Moderate or High Probability of Occurring Onsite

Species	Scientific Name	Probability	Location
Rock sandwort	*Arenaria lanuginosa* ssp. *saxosa*	Moderate probability	meadow, lakeshore
Crested milk vetch	*Astragalus bicristatus*	High probability	rocky areas
Big Bear Valley milk vetch	*Astragalus lentiginosus* var. *sierrae*	High probability	open forest
Palmer's mariposa lily	*Calochortus palmeri* var. *palmeri*	Moderate probability	meadow
Western sedge	*Carex occidentalis*	Moderate probability	meadow
San Bernardino Mountain owl's clover	*Castilleja lasiorhyncha*	Moderate probability	meadow
San Bernardino Mountains dudleya	*Dudleya abramsii* ssp. *affinis*	Moderate probability	pebble plains
Southern Sierra woolly sunflower	*Eriophyllum lanatum* var. *obovatum*	High probability	forest
Jepson's bedstraw	*Galium jepsonii*	High probability	forest
Johnston's bedstraw	*Galium johnstonii*	Low to moderate probability	forest
Parry's sunflower	*Hulsea vestita* ssp. *parryi*	Low to moderate probability	open slopes
Duran's rush	*Juncus duranii*	Moderate probability	meadow
Short-sepaled lewisia	*Lewisia brachycalyx*	Moderate probability	meadow
Baldwin Lake linanthus	*Linanthus killipii*	High probability	pebble plains
San Bernardino Mountain monkeyflower	*Mimulus exiguus*	High probability	meadow margin, etc.
Purple monkeyflower	*Mimulus purpureus*	High probability	meadow margin, etc.
Chickweed oxytheca	*Oxytheca caryophylloides*	High probability	open forest
Parish's yampah	*Perideridia parishii* ssp. *parishii*	Low to moderate probability	meadow
Transverse Range phacelia	*Phacelia exilis*	High probability	meadow margin, etc.
Mojave phacelia	*Phacelia mohavensis*	High probability	meadow margin, etc.

Table 1 (Cont.)
Sensitive Plant Species Having a Moderate or High Probability of Occurring Onsite

Species	Scientific Name	Probability	Location
Bear Valley phlox	*Phlox dolichantha*	High probability	throughout
Bear Valley pyrrocoma	*Pyrrocoma uniflora* ssp. *gossypina*	Low - moderate probability	meadow
Parish's rupertia	*Rupertia rigida*	High probability	throughout
Tehachapi ragwort	*Senecio ionophyllus*	Moderate probability	throughout
Laguna Mountains jewelflower	*Streptanthus bernardinus*	Moderate probability	forest
Southern jewelflower	*Streptanthus campestris*	High probability	forest
Pine green-gentian	*Swertia neglecta*	High probability	Forest
Small-flowered bluecurls	*Trichostema micranthum*	High probability	meadow

C. SAN BERNARDINO COUNTY PROTECTED PLANTS

The San Bernardino County Native Plant Protection policy (1989) regulates removal of trees greater than 6 inches diameter at breast height (dbh), smoke trees, mesquite, creosote rings, and all plants in the agave family, including Joshua trees. Although there are no smoke trees, mesquite, creosote rings or species in the agave family that occur on property, Jeffrey pines and other native forest trees greater than 6 inches dbh do occur onsite. An arborist survey and report on these trees is recommended.

VI. IMPACTS

A. IMPACTS TO SPECIAL STATUS PLANTS AND HABITAT

Project construction includes grading new roads, driveways and building pads throughout most of the property, and the loss of some of the native vegetation. Pebble plains and open forest patches on the site are occupied by at least one threatened or endangered plant (ash-gray Indian paintbrush) and four other sensitive but unlisted plant species (Parish’s rock-cress, Heckard’s paintbrush, Bear Valley woollypod and silver-haired ivesia). Development could eliminate or substantially reduce the populations of all five plant species populations. Although these habitats are somewhat degraded by vehicles and invasive plants, adverse impacts to listed species would meet the CEQA threshold for mandatory findings of significance.

Similarly, development could eliminate or substantially reduce the populations of five other listed plants that potentially occur on the site but were not identified during previous surveys. These species include Bear Valley sandwort, southern mountain buckwheat, bird-foot checkerbloom, San Bernardino bluegrass, and California dandelion. Impacts to any of those species, if present, would meet the CEQA threshold for mandatory findings of significance if any of these listed plants occur on the site.

Impacts to the sensitive but unlisted plants listed in Table 1 generally would not meet the CEQA threshold for mandatory findings of significance.

VII. RECOMMENDATIONS

A. AGENCY CONSULTATION OR FURTHER STUDIES

To minimize loss of forest canopy on the property, we recommend that an arborist map and inventory trees on the site, and designing roads and building sites to minimize the number of overstory trees to be removed. Once those trees that must be removed are identified, we recommend applying to San Bernardino County for applicable permits under the County's native plant protection policy.

B. MITIGATION MEASURES

1. Additional Surveys

Surveys of wet meadow habitat near the lakeshore should be repeated to determine presence or absence of the listed threatened or endangered species whose presence or absence could not be determined this year. If the surveys determine that one or more listed species occurs in the meadow area, then additional compensation will be required.

2. Avoidance or Minimization

Avoiding or minimizing impacts to sensitive plant habitat is the preferred mitigation measure. However, this mitigation measure would likely reduce project feasibility. It may not provide long-term conservation of the listed plants due to the isolation that will result from project development.

3. Off-site Compensation

Off-site compensation is an available mitigation measure for impacts to ash-gray Indian paintbrush and the pebble plain habitat. The San Bernardino National Forest actively manages to preserve pebble plain habitat, including areas supporting ash-gray paintbrush. There are numerous privately-owned sites in the Big Bear Valley that support pebble plain that could be purchased and managed for conservation. In addition, the California Wildlife Foundation has established a fund, administered by the California Department of Fish and Game, for the purchase and conservation of pebble plain habitat in the Big Bear area.

It is recommended that the anticipated loss of a federally listed threatened plant (ash-gray Indian paintbrush) and pebble plain habitat be mitigated by contributing to the funding of purchase and management of off-site habitat through the California Wildlife Foundation fund. It is anticipated that mitigation will be required at 3:1 ratio.

4. Onsite Management

Impacts to the pebble plains habitat and sensitive plants will be minimized by the project's design, which will place the pebble plain area, particularly the area occupied ash-gray Indian paintbrush habitat, into a permanently protected open space. The long-term conservation value of the proposed open space requires active onsite land management to prevent "edge effects" from

existing and proposed new adjacent land uses. Exhibit 4 shows these areas on the project site that would be expected to be subject to edge effects.

The following discussion of edge effects on rare plants is based on an analysis by the Conservation Biology Institute (2000) addressing San Fernando Valley spineflower, an endemic southern California species threatened by development and surrounding land uses in the Santa Clarita Valley. Sensitive plants found near developed lands tend to die out due to a variety of edge effects, including:

- Exclusion by invasive weedy plants introduced deliberately or accidentally into developed landscapes;
- Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation.
- Altered hydrology caused by irrigation overspray, road runoff, or water diversions installed for erosion control;
- Direct damage by pets and feral animals (e.g., digging by dogs and cats);
- Indirect effects of non-native animals, such as elimination of native pollinators by invasive Argentine ants;
- Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes; and
- Pollution from over-sprayed or runoff landscaping chemicals (insecticides, herbicides, fertilizers).

Conservation planners can design "buffer areas" to separate managed sensitive species or habitat areas from the indirect effects from adjacent land uses. Roads, trails, or fuel modification land uses were not considered consistent with buffer function. The Conservation Biology Institute analysis (2000) estimated that buffer widths of 200 feet would be "highly likely to be effective" in buffering sensitive plant occurrences from a series of adverse edge effects from adjacent land uses.

Most land surrounding the proposed Moon Camp site is in private ownership, except in the northeastern corner where National Forest land is adjacent to the north and east. None of the surrounding private land is managed as either a buffer area or for conservation. Most of the adjacent land has been developed and would not be available for conservation or a buffer area. The proposed project will be subject to substantial edge effects from adjacent residential development and roads, especially Highway 38 (see Exhibit 4).

IX. CONCLUSION

Two sensitive plant communities (Pebble Plain and meadow habitats) occur on the project sites. These two plant communities support an array of endemic plant species, including the federally threatened ash-gray Indian paintbrush and four plant species of special concern (Parish's rock-cress, Big Bear Valley woollypod, Heckard's paintbrush, and silver-haired ivesia). Development of the project site is expected to result in direct and indirect impacts to the sensitive plant communities and associated endemic plant species. Several recommendations are made to help minimize these impacts.

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Appendix 1: Special Status Species Not Addressed

Appendix 1: Special Status Plants of the Bear Valley Region Not Addressed Due to Habitat or Range

Common name	Latin name	Reason for exclusion
White-margined everlasting	*Antennaria marginata*	Outside geogr. range (only local occurrences in Barton Flats area)
Pinyon rock-cress	*Arabis dispar*	Outside geogr. range (only local occurrences on desert-facing slopes)
Shockley's rock-cress	*Arabis shockleyi*	Outside geogr. range (only local occurrences on desert-facing slopes)
Cushenbury milk-vetch	*Astragalus albens*	No suitable habitat (carbonate)
Triple-ribbed milk-vetch	*Astragalus tricarinatus*	No habitat (desert shrubland), well above elev. range (below about 4000 ft.), Cushenbury Cyn report erroneous
Parish's small-scale	*Atriplex parishii*	No suitable habitat (alkali sink)
Fremont barberry	*Berberis fremontii*	No local occurrences (presumed extinct in Cushenbury area)
Scalloped moonwort	*Botrychium crenulatum*	No suitable habitat (marshes, bogs)
Plummer's mariposa lily	*Calochortus plummerae*	Above elev. range (below about 5500 ft.)
Alkali mariposa lily	*Calochortus striatus*	No habitat (desert alkaline meadows, seeps) above elev. range (below about 5300 ft.)
Parish's daisy	*Erigeron parishii*	No suitable habitat (carbonate)
Cushenbury buckwheat	*Eriogonum ovalifolium var. vineum*	No suitable habitat (carbonate)
Moss gentian	*Gentiana fremontii*	Well below elev. range (occurs in San Gorgonio Wilderness)
Los Angeles sunflower	*Helianthus nuttallii ssp. parishii*	Well above elev. range (below about 4000 ft. elev.)
Barton Flats horkelia	*Horkelia wilderae*	Outside geogr. range (endemic to Barton Flats area)
California satintail	*Imperata brevifolia*	Well above elev. range (below about 3000 ft.)
San Bernardino Mtn. bladderpod	*Lesquerella kingii ssp. bernardinus*	No habitat (carbonate)
Adder's mouth	*Malaxis monophyllos ssp. brachypoda*	Well below elev. range (occurs in San Gorgonio Wilderness)
Cienega Seca oxythexca	*Oxytheca parishii var. cienegensis*	Outside geogr. range (known only from Cienega Seca and Pipes Cyn areas)
Cushenbury oxytheca	*Oxytheca parishii var. goodmaniana*	No habitat (carbonate)
Frosted mint	*Poliomintha incana*	No suitable habitat (desert dunes and sandy flats)
Narrow-leaved cottonwood	*Populus angustifolia*	No San Bernardino Mountain occurrences (local reports unverified)
Latimer's woodland gilia	*Saltugilia latimeri*	No habitat (desert shrubland,pinyon woodland); above elev. range (below about 6200 ft.)
Slender-petaled thelypodium	*Thelypodium stenopetalum*	No habitat (alkaline meadows)

Appendix 2: Special Status Species

Appendix 2: Special Status Species Potentially Occurring on the Project Site

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Abronia nana ssp. *covillei* Coville's dwarf abronia	Perennial herb; carbonate and sandy soils within pinon-juniper woodlands; San Bernardino Mts. and mountains of E Mojave, about 5,200 - 10,200 ft.	May -August	Fed: none Calif: S3.2 CNPS List 4.2	Low (marginally suitable habitat)
Allium parishii Parish's onion	Bulb; open shrubland & woodland, gen. sandy bajadas or mtn slopes, often carbonate soil, about 3000 – 5,500 ft. elev.; N San Bern Mtns and Moj Des Mtns, to W Ariz.	Apr - May	Fed: none Calif: S3.3? CNPS List 4.3	Minimal (above elev. range)
Arabis parishii Parish's rock cress	Perennial herb; pebble plains, occas. on carbonate soil; open dry sites in conifer forest; about 5,800 – 9,500 ft. elev.; San Bernardino Mtns. endemic	April - May	Fed: none Calif: S2.1 CNPS List 1B. 2	Occurs (2007 survey; NDDB report)
Arenaria lanuginosa ssp. *saxosa* (*A. confusa*) Rock sandwort	Perennial herb; sandy soils, streams or meadows; about 5900 to 8600 ft. elev.; San Bernardino Mtns, W US and N Baja Calif.	July - Aug	Fed: none Calif: S1.3 CNPS List 2.3	Moderate (moderately suitable habitat)
Arenaria ursina Bear Valley sandwort	Perennial herb, pebble plains, occas. on carbonate soils, about 5,900 – 9,500 ft. elev.; San Bernardino Mtns. endemic	June - July	Fed: THR Calif: S 2.1 CNPS: List 1B.2	Occurs? (NDDB record #23)
Aster bernardinus (*Symphyotrichum defoliatum*) San Bernardino aster	Perennial herb; wetlands and margins, near sea level to about 6,700 ft. elev.; formerly widespread, Kern Co to San Diego Co, but most sites extirpated	July - Nov	Fed: none Calif: S 3.2 CNPS List 1B.2	Low (field surveys; upper margin of elev. range)
Astragalus bicristatus Crested milk vetch	Perennial herb; rocky slopes, montane conifer forest; about 5,500 – 9,000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	May - August	Fed: none Calif: S3.3 CNPS List 4.3	High (suitable habitat occurs)
Astragalus lentiginosus var. *sierrae* Big Bear Valley milk vetch	Perennial herb; open rocky soils or compacted areas in pine forest; about 5,900 – 8,500 ft. elev.; San Bernardino Mtns endemic	April - August	Fed: none Calif: S1? CNPS List 1B.2	High (suitable habitat occurs)
Astragalus leucolobus Bear Valley woollypod	Perennial herb; open or disturbed soils, pine forests and sagebrush scrub, about 5,600-8,800 ft. elev.; San Gabriel Mtns to Santa Rosa Mtns	May - July	Fed: none Calif: S 2.2 CNPS List 1B.2	Occurs

Appendix 2: Special Status Species Potentially Occurring on the Project Site

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Calochortus palmeri vars. *palmeri* and *munzii* Palmer's & Munz's mariposa lilies	Bulb; meadows or seasonally moist sites; about 3,300 – 7,200 ft. elev.; var. *palmeri* occurs S Coast & Transverse Ranges, reported but not verified San Jacinto Mtns; var. *munzii* endemic to San Jacintos, reported but not verified in San Bernardinos	May - July	Fed: none CNPS List 1B.2 var *palmeri*: Calif: S 2.1 var. *munzii*: Calif: S 1.2	Moderate (marginally suitable habitat)
Carex occidentalis Western sedge	Rhizomatous perennial; meadows & seeps; San Bernardino Mtns, White Mtns, scattered in western states; about 6,200 - 10,300 ft. elev.	June - Aug	Fed: none Calif: S2S3 CNPS List 2.3	Moderate (marginal habitat)
Castilleja cinerea Ash-gray Indian paintbrush	Perennial herb; pebble plains, dry meadows, about 5,900 to 9,100 ft. elev.; partially parasitic usually on matting buckwheats; San Bernardino Mtns endemic	May - August	Fed: THR Calif: S2.2 CNPS List 1B.2	Occurs (field survey and CNDDB report)
Castilleja lasiorhyncha (*Orthocarpus lasiorhynchus*) San Bernardino Mountain owl's clover	Annual; meadows, streamsides, seeps, etc., about 4,200-7,800 ft. elev.; San Bernardino Mtns. and (historically) San Jacinto Mtns.; reports from San Diego Co. unconfirmed	June - Aug	Fed: none Calif: S2.2 CNPS List 1B.2	Moderate (marginal habitat)
Castilleja applegateii ssp. *martinii* H *C. angustifolia* (=*C. montigena, C. martinii* var. *ewanii*) Heckard's paintbrush	Perennial herb; conifer forest; San Bernardino Mountains endemic (treated as a species by CNPS but considered a hybrid by Chuang & Heckard in Jepson Manual)	March - July	Fed: none Calif: S3.3 CNPS List 4.3	Occurs (Jeffrey pine forest)
Dryopteris filix-mas Male fern	Perennial herb; widespread in N hemisphere, esp. at high latitudes; only two reports in Calif., incl. Holcomb Valley	July - Sept.	Fed: none Calif: S 1.3 CNPS List 2.3	Low (local rarity)
Dudleya abramsii ssp. *affinis* San Bernardino Mts. dudleya	Perennial herb, pebble plains & rock outcrops (often carbonate); pinyon woodland, open pine forests, about 5,200-8,500 ft. elev.; San Bernardino Mtns endemic	April - June	Fed: none Calif: S 2.2 CNPS: List 1B.2	Moderate (marginal habitat)
Eriogonum foliosum (*E. evanidum*) Leafy buckwheat	Annual; sandy soil, woodlands or shrublands; about 3,900-7,200 ft. elev.; scattered locations, Big Bear Valley to N Baja Calif.; may be extinct in Calif.	July - Oct.	Fed: none Calif: SH CNPS List 1B.2	Minimal (presumed extinct, local rarity)

Appendix 2: Special Status Species Potentially Occurring on the Project Site

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Eriogonum kennedyi var. *austromontanum* Southern mountain buckwheat	Matting woody perennial; pebble plains and similar soils, about 5,800 – 7,800 ft. elev.; nearly endemic to Big Bear area, also reported at Mt. Pinos	July - August	Fed: THR Calif: S2.2 CNPS: List 1B.2	Apparent introgression w/ Wright's buckwheat (see text)
Eriogonum microthecum var. *lacus-ursi* Bear Lake buckwheat	Subshrub; montane forests and shrublands; only known occurrence at Big Bear Lake shore ca. 7,200 ft. elev.	July - Sept	Fed: none Calif: S 1 CNPS List 1B.1	Minimal (field survey)
Eriophyllum lanatum var. *obovatum* Southern Sierra woolly sunflower	Perennial herb; open montane coniferous forests, 4,200-8,200 ft. elev.; S Sierra Nevada and western San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Galium jepsonii (*G. angustifolium* var. *subglabrum*) Jepson's bedstraw	Perennial herb; sandy or gravelly soils, montane conifer forest, 6,500-8,100 ft. elev.; San Gabriel and San Bernardino Mtns	July - August	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Galium johnstonii (*G. angustifolium* var. *pinetorum*) Johnston's bedstraw	Perennial herb, dry slopes, chaparral, lower montane forest, pinyon and juniper woodland; about 4,000-7,600 ft. elev.; San Bernardino, San Gabriel, maybe San Jacinto mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Low-moderate (suitable habitat occurs; margin of elev. range)
Gilia leptantha ssp. *leptantha* San Bernardino Mtn. gilia	Annual; sandy or gravelly soils, open pine forest; endemic to upper Santa Ana Riv. watershed, San Bernardino Mtns., about 5,000 to 7,700 ft. elev.	June - Aug	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (probably outside geogr. range)
Heuchera hirsutissima Shaggy-haired alum root *Heuchera parishii* Parish's alumroot	Perennial herbs; rocky outcrops, cliffs, slopes; montane forest or alpine boulderfields; above about 4,800 ft. elev.; *H. hirsutissima* is endemic to San Jacinto and Santa Rosa Mtns (unconfirmed from San Bernardino Mtns); *H. parishii* endemic to San Bernardino Mtns	May - July	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (poorly suitable habitat)
Hulsea vestita ssp. *parryi* Parry's sunflower	Perennial herb; gen. conifer forests, on loose eroding soil and talus; San Bernardino Mtns and Little San Bern. Mtns; about 5,500-9,500 ft. elev.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	Low-moderate (marginal habitat)

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Ivesia argyrocoma Silver-haired ivesia	Perennial herb; pebble plains, seasonal meadows, drainages; about 4,900-8,800 ft. elev.; San Bernardino Mtns and a long-disjunct site in Baja Calif mtns	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Occurs (field survey & NDDB record)
Juncus duranii Duran's rush	Perennial herb; meadows, seeps, etc., montane forest, about 5,800-9,000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	July - August	Fed: none USFS: none Calif: S 3.3 CNPS: List 4.3	Low (masrginal habitat occurs)
Lewisia brachycalyx Short-sepaled lewisia	Perennial herb; wet meadows, mesic forest openings, about 4,500-7,600 ft. elev.; San Bernardino Mtns to Baja Calif, Utah, New Mexico	May - June	Fed: none Calif: S3.2 CNPS: List 2.2	Low-Moderate (marginal habitat)
Lilium parryi Lemon lily	Bulb; meadows and streambanks, about 4,200 – 8,600 ft. elev.; mtns of S Calif. and SE Arizona	July - August	Fed: none Calif: S2.1 CNPS: List 1B.2	Low (marginal habitat)
Linanthus killipii Baldwin Lake linanthus	Annual; pebble plains, alkaline meadows, forest openings, about 5,500-7,900 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.1 CNPS: List 1B.2	High (suitable habitat occurs)
Mimulus exiguus San Bernardino Mountain monkeyflower	Annual; open, seasonally moist meadows, seeps, drainages, about 5,900 – 7,600 ft. elev.; San Bernardino Mtns. and high mtns of Baja Calif.	June - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Mimulus purpureus Purple monkeyflower	Annual; meadow edges, forests, drainages, seeps, about 6,200 – 7,600 ft. elev.; San Bernardino Mtns and high mtns of Baja Calif.	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Navarretia peninsularis Baja navarretia	Annual herb; open, seasonally wet places in coniferous forests, about 4,900 -7,600 ft. elev.; mtns of central and S Calif. and N Baja Calif.	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low (small patches of marginal habitat)
Oxytheca caryophylloides Chickweed oxytheca	Annual; sandy soils in conifer forests, 3,900-8,500 ft. elev.; S Sierra Nevada, Transverse Ranges, San Jacinto Mtns	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Perideridia parishii ssp. *parishii* Parish's yampah	Perennial herb; meadows, moist areas in conifer forest, about 4,800 – 9,900 ft. elev.; San Bernardino Mtns and (disjunct) AZ, Nevada, New Mexico	June - August	Fed: none Calif: S2.2? CNPS: List 2.2	Low - moderate (marginal habitat)

Appendix 2: Special Status Species Potentially Occurring on the Project Site

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Phacelia exilis (*P. mohavensis* var. *exilis*) Transverse Range phacelia	Annual; sandy or gravelly soils, forest openings, meadows, pebble plains, about 3,600 – 8,900 ft. elev.; S Sierra Nevada and Transverse Ranges	May - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Phacelia mohavensis Mojave phacelia	Annual; sandy or gravelly soil; dry meadows and streambeds gen. within pine forest, about 4,500-8,100 ft. elev.; San Gabriel & San Bernardino Mtns.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Phlox dolichantha Bear Valley phlox	Perennial herb; montane forest and pebble plains; about 6,000 – 9,800 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Poa atropurpurea San Bernardino bluegrass	Open, flat meadows, about 6,700 – 7,500 ft. elev. in the San Bernardinos; endemic to San Bernardino Mtns and San Diego Co. (Palomar and Laguna Mtns where it ranges down to about 4,400 ft. elev.)	May - June	Fed: END Calif: S2.2 CNPS: List 1B.2	Low (habitat marginal at best)
Potentilla glandulosa ssp. *ewanii* Ewan's cinquefoil	Perennial herb; mesic conifer forest, about 6,200-7,900 ft. elev.; nearly endemic to San Gabriel Mtns., but also reported from Fawnskin area, San Bernardino Mtns.	June - July	Fed: none Calif: S 1.3 CNPS List 1B.3	Low (field survey)
Pyrrocoma uniflora ssp. *gossypina* (*Haplopappus uniflorus* ssp. *gossypinus*) Bear Valley pyrrocoma	Perennial herb; meadows (usually alkaline), pebble plains, about 5,200 – 7,600 ft. elev.; San Bernardino Mts endemic	July - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low - moderate (marginally suitable habitat occurs)
Rupertia rigida (*Psoralea rigida*) Parish's rupertia	Perennial herb; chaparral, forests, and woodlands, about 2,300-8,200 ft. elev.; San Bernardino Mtns, Peninsular Ranges, Baja Calif.	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Selaginella asprella Bluish spike-moss	Herb; rocks, crevices, & rocky soils, dry sites in conifer forests, about 5,200-8,800 ft. elev.; scattered mtn. ranges of cent. & S Calif., Baja Calif.	July	Fed: none Calif: S3.3 CNPS: List 4.3	Low (marginal habitat)
Senecio bernardinus (*Packera bernardinoa*) San Bernardino butterweed	Perennial herb; dry meadows (incl. alkaline), about 5,900-7,600 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	Low (marginally suitable habitat)

Appendix 2: Special Status Species Potentially Occurring on the Project Site

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Senecio ionophyllus Tehachapi ragwort	Perennial herb; crevices, rocky places in dry conifer forest, about 4,800-8,900 ft. elev.; S Sierra Nevada, San Gabriel and San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Moderate (suitable habitat)
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	Perennial herb; chaparral, oak shrubland or woodland, pine forest; San Bernardino Mtns. and a few Santa Barbara Co. sites, about 3,200 – 6,000 ft. elev.	June - August	Fed: none CA: Rare S 1.2 CNPS: List 1B.2	Minimal (marginal habitat, above elev. range)
Sidalcea pedata Bird's foot checkerbloom	Perennial herb; meadows (freshwater or alkaline clay), sometimes streambanks, about 5,200-8,200 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: END Calif: END, 1.1 CNPS: List 1B.1	Low (habitat marginal at best)
Sphenopholis obtusata Prairie wedge grass	Perennial grass; riparian woodlands, meadows, streambanks; about 1,000 – 6,600 ft. elev.; few scattered locns in Calif. but widespread in N America	April - July	Fed: none Calif: S2.2 CNPS: List 2.2	Low (upper margin elev. range; poor habitat)
Streptanthus bernardinus Laguna Mountains jewelflower	Perennial herb; chaparral, hardwood & conifer forest, about 3,900-8,100 ft. elev.; mtns of S Calif. (gen. W half of San Bernardino Mtns)	June - July	Fed: none Calif: S 3.3 CNPS: List 4.3	Moderate (margin of geogr. range)
Streptanthus campestris Southern jewelflower	Perennial herb; shrublands, forests, woodlands, often rocky sites, about 2,900 -7,600 ft. elev.; Transverse and Peninsular Ranges, Baja Calif.	May - July	Fed: none Calif: S 2.3 CNPS: List 1B.3	High (suitable habitat occurs)
Swertia neglecta (*Frasera neglecta*) Pine green-gentian	Perennial herb; conifer forests and pinyon woodland., about 4,600-8,200 ft. elev.; S Coastal Ranges and Transverse Ranges	May - July	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Taraxacum californicum California dandelion	Perennial herb; wet meadows, about 5,300 – 9,200 ft. elev.; San Bernardino Mtns endemic	May - Aug	Fed: END Calif: S2.1 CNPS: List 1B.2	Low - moderate (suitable habitat occurs)
Thelypodium stenopetalum Slender-petaled thelypodium	Perennial herb; meadows (mesic, usually alkaline clay), about ,5200 – 8,200 ft. elev.; endemic to Big Bear and Holcomb Valleys	May - Aug	Fed: END Calif: END, 1.1 CNPS: List 1B.1	Minimal (no alkaline meadow habitat)
Trichostema micranthum Small-flowered bluecurls	Annual; dry margins of lakes, meadows, and streams, 5,000-7,600 ft. elev., San Bernardino Mtns and Baja Calif.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Viola pinetorum ssp. *grisea* Grey-leaved violet	Perennial herb; montane forests, about 4,900 -11,200 ft. elev.; S Sierra Nevada and reported San Bernardino Mtns (CNPS but no other source)	April - July	Fed: none Calif: S 1.3 CNPS: List 1B.3	Low (suitable habitat occurs; may be outside geogr. range)
General references: CDFG 2007a, 2007b; CNPS 2007; Hickman (ed.) 1993; Munz 1974; Sanders et al. 1995; Tibor 2001, US Fish and Wildlife Service 2006.				

Appendix 3: Species List

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
CUPRESSACEAE	**CYPRESS FAMILY**		
Calocedrus decurrens	Incense cedar	Occas. / forest	
Juniperus occidentalis	Western juniper	Comm. / forest	
PINACEAE	**PINE FAMILY**		
Abies concolor	White fir	Occas. / forest	
Pinus jeffreyi	Jeffrey pine	Comm. / forest	
Pinus monophylla	Pinyon pine	Occas. /forest	
APIACEAE	**CELERY FAMILY**		
Lomatium nevadense	Nevada lomatium	Uncomm. / forest	11669
Tauschia parishii	Parish tauschia	Scarce / open places	11668
ASTERACEAE	**ASTER FAMILY**		
Achillia millefolium	California yarrow	Comm. / esp. mesic sites	
Agoseris retrorsa	Spear-leaved agoseris	Occas. / throughout	
Antennaria dimorpha	Low everlasting	Comm. / pebble plains	
Artemisia dracunculus	Tarragon	Occas. / esp. near road, lakeshore	
Artemisia ludoviciana	Western mugwort	Occas. / open places, washes	
Artemisia tridentata	Great Basin sagebrush	Comm. / open forest	
Aster frondosus	Short-rayed alkali aster	Occas.-comm. / near shore	
Chrysothamnus nauseosus	Common rabbitbrush	Occas. / throughout	
Chrysothamnus viscidiflorus	Curlleaf rabbitbrush	Occas.-comm. / throughout	
Cirsium occidentale var. californicum	California thistle	Uncomm. / open sites	
* *Cirsium vulgare*	Bull thistle	Occas. / near shore	
Erigeron breweri	Brewer's daisy	Occas. / forest	
Erigeron divergens	Diffuse daisy	Comm. / gen. open places	11667
Eriophyllum confertiflorum	Golden yarrow	Comm. / ± throughout	
Gnaphalium canescens	Perennial cudweed	Uncomm. / gen. open places	
* *Gnaphalium luteo-album*	Pearly everlasting	Occas. / roadside, shoreline	
Hymenopappus filifolius	Columbia cutleaf	Uncomm. / open forest	
* *Lactuca serriola*	Prickly lettuce	Occas. / mostly roadside	
Lessingia filaginifolia (Corethrogyne filaginifolia)	Chaparral aster	Occas. / open forest	
Madia elegans	Elegant tarplant	Occas. / forest	
* *Senecio vulgaris*	Common groundsel	Uncomm. / gen. roadside	
Solidago californica	California goldenrod	Occas. / mesic sites	
* *Sonchus oleraceus*	Common sow thistle	Occas. / near shore	

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
* *Taraxacum officinale*	Common dandelion	Occas. / roadside, shoreline	
Tetradymia comosa	Hairy horsebrush	Occas. / open forest	
* *Tragopogon dubius*	Oyster plant, salsify	Occas. / roadside, forest	
BORAGINACEAE	**BORAGE FAMILY**		
Cryptantha micrantha	Purple root cryptantha	Occas. / open places	
Cryptantha simulans	Popcorn flower	Scarce / open places	11670
BRASSICACEAE	**MUSTARD FAMILY**		
Arabis holboellii (?)	Holboell's rock-cress	Occas. / open forest	
** *Arabis parishii*	Parish's rock-cress	Occas. / pebble plains	11665
Caulanthus major	Slender wild-cabbage	Occas. / forest	
Descurainia incisa (D. richardsonii)	Mountain tansy mustard	Uncomm. / near road	
Descurainia pinnata	Tansy mustard	Occas. / mostly open forest	
Erysiumum capitatum	Douglas wallflower	Occas. / ±throughout	
* *Lepidium virginicum v. pubescens*	Wild peppergrass	Occas. / mostly roadside, shoreline	
* *Sisymbrium altissimum*	Tumble mustard	Occas. / roadside	
CACTACEAE	**CACTUS FAMILY**		
Opuntia basilaris var. basilaris	Common beavertail cactus	Uncomm. / open forest	
CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**		
Symphoricarpos rotundifolius var. parishii	Parish snowberry	Occas. / shaded forest	
CARYOPHYLLACEAE	**CARNATION FAMILY**		
Silene verecunda ssp. platyota	Cuyamaca campion	Occas. / forest	
CHENOPODIACEAE	**GOOSEFOOT FAMILY**		
* *Chenopodium album (?)*	Common goosefoot	Occas. / throughout	
* *Salsola tragus*	Russian thistle, tumbleweed	Occas. / mostly roadside	
CONVOLVULACEAE	**MORNING GLORY FAMILY**		
Calystegia malacophylla ssp. fulcrata (C. fulcrata)	Morning glory	Occas. / throughout	
ERICACEAE	**MANZANITA FAMILY**		
Arctostaphylos patula	Greenleaf manzanita	Occas.-comm. / forest	
EUPHORBIACEAE	**SPURGE FAMILY**		
Chamaesyce albomarginata	Rattlesnake spurge	Occas. / open forest	
Euphorbia palmeri	Wood spurge	Occas. / uplands	
FABACEAE	**PEA FAMILY**		
Amorpha californica	California false indigo	Occas. / mesic forest	
** *Astragalus leucolobus*	Bear Valley woollypod	Comm. / pebble plains	11705
Astragalus douglasii	Douglas rattleweed	Uncomm. / open places	

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
Lotus argyraeus	Silver lotus	Occas. / open forest	
Lotus nevadensis	Nevada lotus	Comm. / open places	
Lupinus cf. breweri	Silver mat lupine	Comm. / pebble plains, etc.	
Lupinus excubitus var. austromontanus	Southern mountain lupine	Occas. / ± throughout	11666
Lupinus lepidus v. confertus	Prairie lupine	Occas. / lakeshore	
* *Medicago lupulina*	Black medick	Uncomm. / near lakeshore	
* *Melilotus alba*	White sweet-clover	Occas.-comm. / roadsides, shore	
FAGACEAE	**OAK FAMILY**		
Quercus kelloggii	California black oak	Comm. / forest	
GERANIACEAE	**GERANIUM FAMILY**		
* *Erodium cicutarium*	Red-stemmed filaree	Occas.-comm. / roadsides, etc.	
HYDROPHYLLACEAE	**WATERLEAF FAMILY**		
Eridictyon trichocalyx	Yerba santa	Occas. / open forest	
Phacelia distans (?)	Common phacelia	Uncomm. / open forest	
Phacelia imbricata	Broad-sepaled phacelia	Uncomm. / open forest	
LAMIACEAE	**MINT FAMILY**		
Monardella linoides (?) (or M. odoratissima)	Flax-leaved monardella	Occas. / forest	
Scutellaria siphocampyloides (S. austinae)	Austin's skullcap	Uncomm. / mesic forest	
LOASACEAE	**STICK-LEAF FAMILY**		
Mentzelia sp.	Unid. stick-leaf	Uncomm. / uplands	11674
MALVACEAE	**MALLOW FAMILY**		
* *Malva parviflora*	Cheeseweed	Occas. / mostly lakeshore	
ONAGRACEAE	**EVENING PRIMROSE FAMILY**		
Clarkia sp.	Unid. annual clarkia	Uncomm. / shaded forest	
Epilobium brachycarpum (E. paniculatum)	Summer cottonweed	Occas.-comm. upland margins	
Epilobium ciliatum	Willow-herb	Occas. / mostly lakeshore	
Gaypohytum sp.	Unid. gayophytum	Comm. / open forest	
POLEMONIACEAE	**PHLOX FAMILY**		
Gilia latiflora (?)	Broad-flowered gilia	Uncomm. / open forest	
Gilia modocensis	Modoc gilia	Occas. /open places	11659
Eriastrum densifolium ssp. densifolium	Mojave woolly-star	Occas. / open forest	
Eriastrum sapphirinum	Sapphire woollystar	Occas. / open forest	
Linanthus breviculus	Mojave linanthus	Comm. / open forest	
Phlox gracilis	Slender phlox	Comm. / open places	11660

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
POLYGONACEAE	**BUCKWHEAT FAMILY**		
Eriogonum davidsonii (=E. molestum var. davidsonii)	Davidson buckwheat	Occas. / open forest	
Eriogonum wrightii ssp. subscaposum	Wright's buckwheat	Comm. & characteristic / pebble plains	
Eriogonum umbellatum v. munzii	Munz sulfur buckwheat	Occas. / open forest	
* *Polygonum arenastrum*	Common knotweed	Occas. / roadside, lake shore	
* *Rumex crispus*	Curly dock	Occas. / mostly lakeshore	
Rumex salicifolius	Willow dock	Uncomm. / near lakeshore	
PORTULACACEAE	**PURSLANE FAMILY**		
Lewisia rediviva	Bitter root	Occas.-comm. / pebble plains	
RANUNCULACEAE	**BUTTERCUP FAMILY**		
Delphinium parishii (?)	Parish larkspur	Occas. / forest	
* *Ranunculus sceleratus*	Cursed buttercup	Occas. / lakeshore	11656
RHAMNACEAE	**BUCKTHORN FAMILY**		
Ceanothus cordulatus	Mountain whitethorn	Occas. / open forest	
Ceanothus greggii	Cupleaf ceanothus	Uncomm. / open forest	
Ceanothus integerrimus	Deerbrush	Occas. / forest	
ROSACEAE	**ROSE FAMILY**		
Amelanchier utahensis	Service berry	Comm. / ± throughout	
Cercocarpus betuloides	Birch-leaf mountain mahogany	Uncomm.	
Cercocarpus ledifolius	Curlleaf mountain mahogany	Comm. / ± throughout	
Horkelia rydbergii (H. bolanderi s. parryi)	Transverse range horkelia	Occas. / mostly near lake	
** *Ivesia argyrocoma*	Silver-haired ivesia	locally comm. / pebble pl.	11658
Potentilla anserina	Silverweed	Comm. / lakeshore	
Potentilla biennis	Biennial cinquefoil	Comm. / lakeshore	11671
Potentilla gracilis	Slender cinquefoil	Occas. / mesic places	
Potentilla wheeleri	Wheeler cinquefoil	Scarce / near lakeshore	11673
RUBIACEAE	**COFFEE FAMILY**		
* *Galium aparine*	Goose grass	Uncomm. / shaded forest	
Galium parishii	Parish bedstraw	Occas. / forest	
SALICACEAE	**WILLOW FAMILY**		
Populus balsamifera trichocarpa	Black cottonwood	Seedlings only / lakeshore	
Salix laevigata (?)	Red willow	Uncomm. / lakeshore	
Salix lasiolepis (?)	Arroyo willow	Comm. / lakeshore	

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
SCROPHULARIACEAE	**SNAPDRAGON FAMILY**		
** *Castilleja cinera*	Ash-gray paintbrush	Localized / pebble plains	11657
** *Castilleja montigena (C. applegatei ssp. martinii)*	Heckerd's paintbrush	Occas. / forest	
Collinsis parviflora	Small-flowered blue-eyed Mary	Comm., patchy / peb. pl.	11661
Limosella acaulis	Mudwort	Comm.-abund. / wet lakeshore	11655
Mimulus guttatus	Seep monkeyflower	Occas. / lakeshore	
Pedicularis semibarbata	Pine-woods lousewort	Occas. / forest	11664
Penstemon eatonii	Eaton firecracker	Occas. / forest	
* *Verbascum thapsus*	Common muellin	Occas. / throughout	
SOLANACEAE	**NIGHTSHADE FAMILY**		
Solanum xanti	Chaparral nightshade	Uncomm. / forest	
STERCULIACEAE	**CACAO FAMILY**		
Fremontodendron californicum	Flannel bush	Occas.-comm. / open forest	
TAMARICACEAE	**TAMARISK FAMILY**		
Tamarix ramosissima	Mediterranean tamarisk	Occas. / lakeshore	
URTICACEAE	**NETTLE FAMILY**		
Urtica dioica ssp. holosericea	Stinging nettle	Occas. / lakeshore	
VIOLACEAE	**VIOLET FAMILY**		
Viola douglasii	Douglas violet	Occas. / pebble plains	11663
Viola purpurea	Mountain violet	Occas. / throughout	11662
VISCACEAE	**MISTLETOE FAMILY**		
Arceuthobium campylopodum	Dwarf mistletoe	Uncomm. / on yellow pines	
CYPERACEAE	**SEDGE FAMILY**		
Carex athrostachya	Slender-beaked sedge	Occas. / near lake	
Carex sp.	Unid. sedge	Uncomm. / near lakeshore	11671
JUNCACEAE	**RUSH FAMILY**		
Juncus arcticus (incl. vars. balticus and mexicanus)	Wire-grass	Occas.-comm. / mesic areas	
LILIACEAE	**LILY FAMILY**		
Allium parryi	Parry's onion	Occas. / mostly pebble plains	
Calochortus kennedyi	Kennedy's mariposa lily	Uncomm. / open forest	
POACEAE	**GRASS FAMILY**		
Agrostis sp.	Unid. bentgrass	Occas. / lakeshore	
Alopecurus aequalis	Short-awn foxtail	Comm., patchy / near shore	
Bromus carinatus	California brome	Occas. / uplands, ±throughout	

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
Bromus orcuttianus (?)	Orcutt brome	Uncomm. / mesic forest	
* *Bromus tectorum*	Cheat grass	Comm. / ± throughout	
Elymus elymoides (Sitanion hystrix v. hystrix)	Bottlebrush squirreltail	Occas. / ± throughout	
Elymus glaucus	Blue wild-rye	Occas. / ± throughout	
Hordeum jubatum	Foxtail barley	Uncomm. / mostly near lake	
* *Koeleria macrantha*	Junegrass	Occas. / mesic forest, uplands	
Melica stricta	Nodding melic	Uncomm. patchy, uplands	
Muhlenbergia rigens	Deergrass	Occas. / throughout	
Poa fendleriana	Fendler bluegrass	Occas.-comm. / forest	
Poa secunda	Nodding bluegrass	Comm. / ± throughout	
* *Polypogon monspeliensis*	Rabbitfoot grass	Occas.-comm. / near shore	
Pucinellia nuttalliana	Alkali grass	Uncomm. / low-lying mesic site	
Stipa coronata ssp. depauperata (Achnatherum parishii)	Parish needlegrass	Occas. / mostly open forest	
Stipa lettermannii	Letterman's needlegrass	Occas. / forest	
Vulpia microstachys (Festuca microstachys, F. reflexa, F. pacifica, F. confusa)	Annual fescue	Uncomm. patchy / upland	

Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season.

Plants were identified using keys, descriptions, and illustrations in Abrams (1923-1951), Hickman (1993), Munz (1974), and other regional references. Taxonomy and nomenclature generally follow Hickman.

Some plants were collected as vouchers (see collection numbers at right) and will be donated to the Herbaria at Rancho Santa Ana Botanic Garden or UC Riverside.

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
AMPHIBIA	**AMPHIBIANS**
SALAMANDRIDAE	**NEWTS**
Taricha torosa	California newt
PLETHODONTIDAE	**LUNGLESS SALAMANDERS**
Ensatina eschscholtzii	Ensatina
Aneides lugubris	Arboreal salamander
Batrachoseps pacificus	Pacific slender salamander
PELOBATIDAE	**SPADEFOOT TOADS**
** *Scaphiopus hammondii*	Western spadefoot
BUFONIDAE	**TRUE TOADS**
Bufo boreas	Western toad
Bufo woodhousei	Woodhouse toad
** *Bufo microscaphus*	Southwestern toad
Bufo punctatus	Red-spotted toad
HYLIDAE	**TREEFROGS**
Hyla cadaverina	California treefrog
Hyla regilla	Pacific treefrog
RANIDAE	**TRUE FROGS**
** *Rana aurora*	Red-legged frog
** *Rana pipiens*	Northern leopard frog
* *Rana catesbeiana*	Bullfrog
REPTILIA	**REPTILES**
EMYDIDAE	**BOX AND WATER TURTLES**
** *Clemmys marmorata*	Western pond turtle
TESTUDINIDAE	**LAND TORTOISES**
** *Gopherus agassizii (Xerobates agassizi)*	Desert tortoise
TRIONYCHIDAE	**SOFTSHELL TURTLES**
Trionyx spiniferus	Spiny softshell
GEKKONIDAE	**GECKOS**
Coleonyx variegatus	Western banded gecko
** *Coleonyx swaitaki*	Barefoot gecko
Phyllodactylus xanti	Leaf-toed gecko
IGUANIDAE	**IGUANID LIZARDS**
Dipsosaurus dorsalis	Desert iguana
Sauromalus obesus	Common chuckwalla
Callisaurus draconoides	Zebra-tailed lizard
** *Uma notata ssp. notata*	Colorado desert fringe-toed lizard
** *Uma inornata*	Coachella valley fringe-toed lizard
** *Uma scoparia*	Mojave fringe-toed lizard
Crotaphytus insularis	Desert collared lizard
Gambelia wislizenii	Long-nosed leopard lizard

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Sceloporus magister	Desert spiny lizard
Sceloporus orcutti	Granite spiny lizard
Sceloporus occidentalis	Western fence lizard
Sceloporus grasiosus	Sagebrush lizard
Uta stansburiana	Side-blotched lizard
Urosaurus graciosus	Long-tailed brush lizard
Petrosaurus mearnsi	Banded rock lizard
** *Phrynosoma coronatum ssp. blainvillei*	San Diego horned lizard
Phrynosoma platyrhinos	Desert horned lizard
** *Phrynosoma mcallii*	Flat-tailed horned lizard
XANTUSIIDAE	**NIGHT LIZARDS**
Xantusia henshawi	Granite night lizard
Xantusia vigilis	Desert night lizard
SCINCIDAE	**SKINKS**
Eumeces skiltonianus	Western skink
Eumeces gilberti	Gilbert skink
TEIIDAE	**WHIPTAILS**
** *Cnemidophorus hyperythrus*	Orange-throated whiptail
** *Cnemidophorus tigris*	Western whiptail
ANGUIDAE	**ALLIGATOR LIZARDS**
Gerrhonotus multicarinatus	Southern alligator lizard
ANNIELLIDAE	**LEGLESS LIZARDS**
** *Aniella pulchra ssp. pulchra*	Silvery legless lizard
LEPTOTYPHLOPIDAE	**SLENDER BLIND SNAKES**
Leptotyphlops humilis	Western blind snake
BOIDAE	**BOAS AND PYTHONS**
** *Charina bottae ssp. umbratica*	Southern rubber boa
Lichanura trivirgata	Rosy boa
COLUBRIDAE	**COLUBRIDS**
** *Diadophis punctatus*	Ringneck snake
Phyllorhynchus decurtatus	Spotted leaf-nosed snake
Coluber constrictor	Racer
Masticophis flagellum	Coachwhip
Masticophis lateralis	California whipsnake
** *Salvadora hexalepis*	Western patch-nosed snake
Arizona elegans	Glossy snake
Pituophis melanoleucus	Gopher snake
Lampropeltis getulus	Common kingsnake
** *Lampropeltis zonata ssp. pulchra*	San Bernardino Mountain kingsnake
Rhinocheilus lecontei	Long-nosed snake
Thamnophis sirtalis	Common garter snake
Thamnophis elegans	Western terrestrial garter snake

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
** *Thamnophis hammondii*	Two-striped garter snake
VIPERIDAE	**VIPERS**
Crotalus atrox	Western diamondback rattlesnake
** *Crotalus ruber*	Red diamond rattlesnake
Crotalus mitchellii	Speckled rattlesnake
Crotalus cerastes	Sidewinder
Crotalus viridis	Western rattlesnake
Crotalus scutulatus	Mojave rattlesnake
AVES	**BIRDS**
GAVIIDAE	**LOONS**
Gavia immer	Common loon
PODICIPEDIDAE	**GREBES**
Podilymbus podiceps	Pied-billed grebe
Podiceps nigricollis	Eared grebe
Aechmophorus occidentalis	Western grebe
Aechmophorus clarkii	Clark's grebe
PELECANIDAE	**PELICANS**
Pelecanus erythrorhynchos	American white pelican
** *Pelecanus occidentalis*	Brown pelican
PHALACROCORACIDAE	**CORMORANTS**
Phalacrocorax auritus	Double-crested cormorant
ARDEIDAE	**HERONS**
Botaurus lentiginosus	American bittern
Ardea herodias	Great blue heron
Casmerodius albus	Great egret
Egretta thula	Snowy egret
Bubulcus ibis	Cattle egret
Butorides striatus	Green-backed heron
** *Nycticorax nycticorax*	Black-crowned night heron
THRESKIORNITHIDAE	**IBISES AND SPOONBILLS**
** *Plegadis chihi*	White-faced ibis
ANATIDAE	**DUCKS, GEESE AND SWANS**
Anser albifrons	Greater white-fronted goose
Chen caerulescens	Snow goose
Chen rossii	Ross' goose
Branta canadensis	Canada goose
Anas crecca	Green-winged teal
Anas platyrhynchos	Mallard
Anas acuta	Northern pintail
Anas discors	Blue-winged teal
Anas cyanoptera	Cinnamon teal
Anas clypeata	Northern shoveler

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Anas strepera	Gadwall
Anas americana	American wigeon
Aythya valisineria	Canvasback
Aythya americana	Redhead
Aythya collaris	Ring-necked duck
Aythya affinis	Lesser scaup
Bucephala clangula	Common goldeneye
Bucephala albeola	Bufflehead
Mergus merganser	Common merganser
Mergus serrator	Red-breasted merganser
Oxyura jamaicensis	Ruddy duck
RALLIDAE	**RAILS, GALLINULES, COOTS**
Rallus longirostris	Clapper rail
Rallus limicola	Virginia rail
Porzana carolina	Sora
Gallinula chloropus	Common moorhen
Fulica americana	American coot
CATHARTIDAE	**VULTURES**
Cathartes aura	Turkey vulture
ACCIPITRIDAE	**HAWKS, EAGLES, HARRIERS**
** *Pandion haliaetus*	Osprey
** *Elanus caeruleus*	Black-shouldered kite
** *Aquila chrysaetos*	Golden eagle
** *Haliaeetus leucocephalus*	Bald eagle
** *Circus cyaneus*	Northern harrier
** *Accipiter striatus*	Sharp-shinned hawk
** *Accipiter cooperii*	Cooper's hawk
Buteo lineatus	Red-shouldered hawk
** *Buteo swainsoni*	Swainson's hawk
Buteo jamaicensis	Red-tailed hawk
** *Buteo regalis*	Ferruginous hawk
Buteo lagopus	Rough-legged hawk
FALCONIDAE	**FALCONS**
Falco sparverius	American kestrel
** *Falco columbarius*	Merlin
** *Falco peregrinus*	Peregrine falcon
** *Falco mexicanus*	Prairie falcon
PHASIANIDAE	**GROUSE AND QUAIL**
Alectoris chukar	Chukar
Phasianus colchicus	Ring-necked pheasant
Callipepla gambelii	Gambel's quail
Callipepla californica	California quail

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Oreortyx pictus	Mountain quail
CHARADRIIDAE	**PLOVERS**
Pluvialis squatarola	Black-bellied plover
** *Charadrius alexandrinus*	Snowy plover
Charadrius semipalmatus	Semipalmated plover
Charadrius vociferus	Killdeer
** *Charadrius montanus*	Mountain plover
RECURVIROSTRIDAE	**STILTS AND AVOCETS**
Himantopus mexicanus	Black-necked stilt
Recurvirostra americana	American avocet
SCOLOPACIDAE	**SANDPIPERS**
Tringa melanoleuca	Greater yellowlegs
Tringa flavipes	Lesser yellowlegs
Catoptrophorus semipalmatus	Willet
Actitis macularia	Spotted sandpiper
Numenius phaeopus	Whimbrel
Numenius americanus	Long-billed curlew
Limosa fedoa	Marbled godwit
Arenaria interpres	Ruddy turnstone
Arenaria melanocephala	Black turnstone
Calidris canutus	Red knot
Calidris alba	Sanderling
Calidris pusilla	Semipalmated sandpiper
Calidris mauri	Western sandpiper
Calidris minutilla	Least sandpiper
Calidris alpina	Dunlin
Limnodromus griseus	Short-billed dowitcher
Limnodromus scolopaceus	Long-billed dowitcher
Gallinago gallinago	Common snipe
Phalaropus tricolor	Wilson's phalarope
Phalaropus lobatus	Red-necked phalarope
LARIDAE	**GULLS AND TERNS**
Larus philadelphia	Bonaparte's gull
Larus delawarensis	Ring-billed gull
Larus californicus	California gull
Larus argentatus	Herring gull
Larus occidentalis	Western gull
Sterna caspia	Caspian tern
Sterna hirundo	Common tern
Sterna forsteri	Forster's tern
COLUMBIDAE	**PIGEONS AND DOVES**
Columba livia	Rock dove

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Columba fasciata	Band-tailed pigeon
* *Streptopelia chinensis*	Spotted dove
Zenaida asiatica	White-winged dove
Zenaida macroura	Mourning dove
Columbina passerina	Common ground-dove
CUCULIDAE	**CUCKOOS**
Geococcyx californianus	Greater roadrunner
TYTONIDAE	**BARN OWLS**
Tyto alba	Common barn-owl
STRIGIDAE	**TYPICAL OWLS**
Otus kennicottii	Western screech-owl
Bubo virginianus	Great horned owl
** *Speotyto cunicularia*	Burrowing owl
** *Asio otus*	Long-eared owl
CAMPRIMULGIDAE	**NIGHTJARS**
Chordeiles acutipennis	Lesser nighthawk
Chordeiles minor	Common nighthawk
Phalaenoptilus nuttallii	Common poorwill
APODIDAE	**SWIFTS**
Chaetura vauxi	Vaux's swift
Aeronautes saxatalis	White-throated swift
TROCHILIDAE	**HUMMINGBIRDS**
Archilochus alexandri	Black-chinned hummingbird
Calypte anna	Anna's hummingbird
Calypte costae	Costa's hummingbird
Selasphorus rufus	Rufous hummingbird
Selasphorus sasin	Allen's hummingbird
ALCEDINIDAE	**KINGFISHERS**
Ceryle alcyon	Belted kingfisher
PICIDAE	**WOODPECKERS**
Melanerpes formicivorus	Acorn woodpecker
Melanerpes lewis	Lewis' woodpecker
Sphyrapicus nuchalis	Red-naped sapsucker
Sphyrapicus thyroideus	Williamson's sapsucker
Picoides scalaris	Ladder-backed woodpecker
Picoides nuttallii	Nuttall's woodpecker
Picoides pubescens	Downy woodpecker
Picoides villosus	Hairy woodpecker
Picoides albolarvatus	White-headed woodpecker
Colaptes auratus	Northern flicker
TYRANNIDAE	**TYRANT FLYCATCHERS**
Contopus borealis	Olive-sided flycatcher

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Contopus sordidulus	Western wood-pewee
Empidonax trailii	Willow flycatcher
Empidonax hammondii	Hammond's flycatcher
Empidonax oberholseri	Dusky flycatcher
Empidonax wrightii	Gray flycatcher
Empidonax difficilis	Western flycatcher
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Myiarchus cinerascens	Ash-throated flycatcher
Tyrannus vociferans	Cassin's kingbird
Tyrannus verticalis	Western kingbird
ALAUDIDAE	**LARKS**
Eremophila alpestris	Horned lark
HIRUNDINIDAE	**SWALLOWS**
Tachycineta bicolor	Tree swallow
Tachycineta thalassina	Violet-green swallow
Stelgidopteryx serripennis	Northern rough-winged swallow
Hirundo pyrrhonota	Cliff swallow
Hirundo rustica	Barn swallow
CORVIDAE	**CROWS AND JAYS**
Cyanocitta stellari	Stellar's jay
Aphelocoma coerulescens	Scrub jay
Gymnorhinus cyanocephalus	Pinyon jay
Nucifraga columbiana	Clark's nutcracker
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
PARIDAE	**CHICKADEES AND TITMICE**
Parus gambeli	Mountain chickadee
Parus inornatus	Plain titmouse
REMIZIDAE	**VERDINS**
Auriparus flavipes	Verdin
AEGITHALIDAE	**BUSHTITS**
Psaltriparus minimus	Bushtit
SITTIDAE	**NUTHATCHES**
Sitta canadensis	Red-breasted nuthatch
Sitta carolinensis	White-breasted nuthatch
Sitta pygmaea	Pygmy nuthatch
CERTHIIDAE	**CREEPERS**
Certhia americana	Brown creeper
TROGLODYTIDAE	**WRENS**
Campylorhynchus brunneicapillus	Cactus wren
** *Campylorhynchus brunneicapillus*	Coastal cactus wren

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Salpinctes obsoletus	Rock wren
Catherpes mexicanus	Canyon wren
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	House wren
Cistothorus palustris	Marsh wren
CINCLIDAE	**DIPPERS**
Cinclus maxicanus	American dipper
MUSCICAPIDAE	**THRUSHES AND ALLIES**
Ixoreus naevius	Varied thrush
Regulus calendula	Ruby-crowned kinglet
Polioptila caerula	Blue-gray gnatcatcher
** *Polioptila melanura*	Black-tailed gnatcatcher
** *Polioptila californica*	California gnatcatcher
Sialia mexicana	Western bluebird
Sialia currucoides	Mountain bluebird
Myadestes townsendi	Townsend's solitaire
Catharus ustulatus	Swainson's thrush
Catharus guttatus	Hermit thrush
Turdus migratorius	American robin
Chamaea fasciata	Wrentit
MIMIDAE	**MOCKINGBIRDS AND THRASHERS**
Mimus polyglottos	Northern mockingbird
Oreoscoptes montanus	Sage thrasher
Toxostoma redivivum	California thrasher
** *Toxostoma crissale*	Crissal thrasher
** *Tosxostoma lecontei*	Le Conte's thrasher
MOTACILLIDAE	**WAGTAILS AND PIPITS**
Anthus spinoletta	American pipit
BOMBYCILLIDAE	**WAXWINGS**
Bombycilla cedrorum	Cedar waxwing
PTILOGONATIDAE	**SILKY FLYCATCHERS**
Phainopepla nitens	Phainopepla
LANIIDAE	**SHRIKES**
Lanius ludovicianus	Loggerhead shrike
STURNIDAE	**STARLINGS**
* *Sturnus vulgaris*	European starling
VIREONIDAE	**VIREOS**
** *Vireo bellii*	Bell's vireo
** *Vireo vicinior*	Gray vireo
Vireo solitarius	Solitary vireo
Vireo huttoni	Hutton's vireo
Vireo gilvus	Warbling vireo

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
EMBERIZIDAE	**SPARROWS, WARBLERS, TANAGERS**
Vermivora celata	Orange-crowned warbler
Vermivora ruficapilla	Nashville warbler
Vermivora luciae	Lucy's warbler
** *Dendroica petechia*	Yellow warbler
Dendroica coronata	Yellow-rumped warbler
Dendroica nigrescens	Black-throated gray warbler
Dendroica occidentalis	Hermit warbler
Dendroica townsendi	Townsend's warbler
Oporornis tolmiei	MacGillivray's warbler
Geothlypis trichas	Common yellowthroat
Wilsonia pusilla	Wilson's warbler
** *Icteria virens*	Yellow-breasted chat
** *Piranga rubra*	Summer tanager
Piranga ludoviciana	Western tanager
Pheucticus melanocephalus	Black-headed grosbeak
Guiraca caerulea	Blue grosbeak
Passerina amoena	Lazuli bunting
Pipilo chlorurus	Green-tailed towhee
Pipilo erythrophthalmus	Rufous-sided towhee
Pipilo crissalis	California towhee
Pipilo aberti	Abert's towhee
Aimophila ruficeps	Rufous-crowned sparrow
Spizella passerina	Chipping sparrow
Spizella breweri	Brewer's sparrow
Spizella atrogularis	Black-chinned sparrow
Pooecetes gramineus	Vesper sparrow
Chondestes grammacus	Lark sparrow
Amphispiza bilineata	Black-throated sparrow
Amphispiza belli	Sage sparrow
Passerculus sandwichensis	Savannah sparrow
Passerella iliaca	Fox sparrow
Melospiza melodia	Song sparrow
Melospiza lincolnii	Lincoln's sparrow
Zonotrichia atricapilla	Golden-crowned sparrow
Zonotrichia leucophrys	White-crowned sparrow
Junco hyemalis	Dark-eyed junco
Agelaius phoeniceus	Red-winged blackbird
** *Agelaius tricolor*	Tricolored blackbird
Sturnella neglecta	Western meadowlark
Xanthocephalus xanthocephalus	Yellow-headed blackbird

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Euphagus cyanocephalus	Brewer's blackbird
Quiscalus mexicanus	Great-tailed grackle
Molothrus ater	Brown-headed cowbird
Icterus cucullatus	Hooded oriole
Icterus galbula	Northern oriole
Icterus parisorum	Scott's oriole
FRINGILLIDAE	**FINCHES**
Carpodacus purpureus	Purple finch
Carpodacus cassinii	Cassin's finch
Carpodacus mexicanus	House finch
Carduelis pinus	Pine siskin
Carduelis psaltria	Lesser goldfinch
Carduelis lawrencei	Lawrence's goldfinch
Carduelis tristis	American goldfinch
PASSERIDAE	**WEAVERS**
* *Passer domesticus*	House sparrow
MAMMALIA	**MAMMALS**
DIDELPHIDAE	**OPOSSUMS**
Didelphis marsupialis	Common opossum
VESPERTILIONIDAE	**EVENING BATS**
Pipistrellus hesperus	Western pipistrelle
LEPORIDAE	**HARES AND RABBITS**
Lepus californicus	Black-tailed hare
Sylvilagus audubonii	Audubon cottontail
Sylvilagus bachmani	Brush rabbit
Sylvilagus sp.	Cottontail
SCIURIDAE	**SQUIRRELS**
** *Citellus mohavensis*	Mohave ground squirrel
** *Citellus tereticaudis ssp. chlorus*	Coachella Valley ground squirrel
** *Glaucomys sabrinus*	Northern flying squirrel
Otospermophilus beecheyi	Beechey ground squirrel
Ammospermophilus leucurus	Antelope ground squirrel
** *Ammospermophilus nelsoni*	San Joaquin antelope ground squirrel
Eutamias merriami	Merriam chipmunk
Sciurus griseus	Western gray squirrel
GEOMYIDAE	**POCKET GOPHERS**
Thomomys bottae	Botta pocket gopher
HETEROMYIDAE	**POCKET MICE**
Perognathus sp.	Pocket mouse
Perognathus longimembris	Little pocket mouse
** *Perognathus longimembris ssp. brevinasus*	Los Angeles pocket mouse
Perognathus formosus	Long-tailed pocket mouse

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Perognathus baileyi	Bailey pocket mouse
Perognathus fallax	San Diego pocket mouse
Perognathus californicus	California pocket mouse
Perognathus spinatus	Spiny pocket mouse
Dipodomys sp.	Kangaroo rat
Dipodomys heermanni	Heermann kangaroo rat
Dipodomys panamintinus	Panamint kangaroo rat
** *Dipodomys stephensi*	Stephens' kangaroo rat
Dipodomys ingens	Giant kangaroo rat
Dipodomys merriami	Merriam kangaroo rat
** *Dipodomys merriami ssp parvus*	Cismontsne Merriam kangaroo rat
Dipodomys nitratoides	San Joaquin kangaroo rat
Dipodomys agilis	Pacific kangaroo rat
Dipodomys deserti	Desert kangaroo rat
CASTORIDAE	**BEAVERS**
Castor canadensis	Beaver
CRICETIDAE	**RATS AND MICE**
Reithrodontomys megalotis	Western harvest mouse
Peromyscus crinitus	Canyon mouse
Peromyscus californicus	California mouse
Peromyscus eremicus	Cactus mouse
Peromyscus maniculatus	Deer mouse
Onychomys torridus	Southern grasshopper mouse
Neotoma sp.	Wood rat
Neotoma albigula	White-throated wood rat
Neotoma lepida	Desert wood rat
Neotoma fuscipes	Dusky-footed wood rat
Microtus pennsylvanicus	Meadow mouse
Microtus californicus	California meadow mouse
MURIDAE	**OLD WORLD RATS AND MICE**
* *Mus musculus*	House mouse
CANIDAE	**FOXES, WOLVES AND COYOTES**
Canis latrans	Coyote
Vulpes macrotis	Kit fox
Urocyon cinereoargenteus	Gray fox
URSIDAE	**BEARS**
* *Ursus americanus*	Black bear
PROCYONIDAE	**RACCOONS**
Bassariscus astutus	Ringtail
Procyon lotor	Raccoon
MUSTELIDAE	**WEASELS AND SKUNKS**
Mustela frenata	Long-tailed weasel

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
** *Taxidea taxus*	American badger
Spilogale putorius	Spotted skunk
Mephitis mephitis	Striped skunk
FELIDAE	**CATS**
Felis concolor	Mountain lion
Lynx rufus	Bobcat
EQUIDAE	**HORSES, BURROS AND ZEBRAS**
* *Equus astinus*	Feral donkey
CERVIDAE	**ELKS, MOOSE, CARIBOU, DEER**
Odocoileus hemionus	Mule deer
BOVIDAE	**SHEEP AND GOATS**
Ovis canadensis	Bighorn
Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season.	

B.8 - Revised Vegetation and Special Status Plants Survey (Scott White Biological Consulting, February 2009)

MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

October 2007
(Revised 2 February 2009)

Prepared for:
Michael Brandman Associates
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San Bernardino, CA 92408

Prepared by:
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SCOTT WHITE BIOLOGICAL CONSULTING
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Project site location: USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1 West, portion of Section 13.
APN: 0304-082-04, 0304-091-12, 0304-091-13, 0304-091-21
Owner: RCK Properties, Tim Wood
Applicant: Urban Environs, Redlands, Calif.
Principal Investigator: Scott D. White, Scott White Biological consulting (above).

CERTIFICATION: I hereby certify that the statements furnished in this report and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me and under my direct suprevision. I certify that I have no0t signed a non-disclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.

DATE: 2 Feb 2009 SIGNED: Scott D W
Scott D. White, Report Author

Additional field work performed by:

DATE: 2 Feb 2009 SIGNED: Justin Wood
Justin Wood

MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

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MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

Scott D. White
SCOTT WHITE BIOLOGICAL CONSULTING
2 February 2009

II: SUMMARY

This report describes results of field surveys for special status plants at the former Moon Camp site in Fawnskin (unincorporated San Bernardino County, California). The project site is about 62 acres. Several listed threatened or endangered plants occur in specialized habitat types in Big Bear Valley and have been found on the site during previous field surveys. The present field work was completed in 2007, a year of very low rainfall. Thus, these surveys cannot support a conclusion that special status plants may be absent from the site. Despite the poor rainfall, one listed threatened species (ash-gray Indian paintbrush) and apparent genetic intergrades of another listed plant (southern mountain buckwheat) with a common relative were both found on the site. Several other special status plants also were found. The proposed project would directly affect ash-gray Indian paintbrush by taking plants and occupied habitat. It also would indirectly affect ash-gray Indian paintbrush, southern mountain buckwheat intergrades, and pebble plain habitat through a variety of off-site or "edge" effects described in Section VII. of this report. The project also would remove numerous trees subject to regulation under the San Bernardino County Native Plant Protection Policy. Further, the project would necessitate alterations to drainageways that may be subject to state or federal regulation as streambeds, wetlands, or waters of the US. We recommend consulting with local, state, and federal agencies as needed to ensure compliance with these laws and policies. We also recommend follow-up botanical surveys to determine presence or absence of other special status meadow species. In order to mitigate take of federally listed plants, we recommend funding off-site habitat preservation and management at a 3:1 ratio for direct effects and at 1:1 ratio for indirect effects.

III: PROJECT AND PROPERTY DESCRIPTION

The San Bernardino County Planning Department is reviewing an application for residential development on the former Moon Camp site in Fawnskin. The project site is on the north shore of Big Bear Lake, in the eastern part of Fawnskin, in unincorporated San Bernardino County. It is about 62 acres, on both sides of State Highway 38, between Oriole Lane and Polique Canyon Road (on the Fawnskin USGS 7½' quadrangle map, in the north half of Section 13, Township 2N and Range 1W). The project site slopes from north to south. Elevation ranges from about 6750 feet near the lakeshore to about 6,960 feet in the northeastern portion of the site.

The project site is within the Big Bear Lake watershed, mapped and described in the Open Space element to San Bernardino County's General Plan (County of San Bernardino 1991), as follows: "This area includes the entire watershed area of Big Bear Lake, and contains a number of specialized habitat areas, which support a large number of endangered plants and animals (as well as commonly occurring mountain species). Habitat values here should be maintained, potentially by controlling development to prevent damage to important habitat areas."

This report addresses special status plant communities and plant species occurring or potentially occurring on the property and incorporates prior botanical work done at the same property, cited below.

IV. FOCUSED STUDY / SPECIES OF CONCERN

There are four federally listed threatened or endangered plant species nearly endemic to meadows and three endemic to "pebble plain" and similar upland habitats in the Big Bear Valley of the northern San Bernardino Mountains (USDI Fish and Wildlife Service 1984, 1998). In addition, there are numerous other special status plant species occurring in these or other habitats in the Big Bear Valley (Appendix 2). This report focuses primarily on the following listed threatened or endangered plants:

Meadow species:

- San Bernardino bluegrass (*Poa atropurpurea*)
- Bird-foot checkerbloom (*Sidalcea pedata*)
- California dandelion (*Taraxacum californicum*)
- Slender-petaled thelypodium (*Thelypodium stenopetalum*)

Pebble plain species:

- Bear Valley sandwort (*Arenaria ursina*)
- Ash-gray Indian paintbrush (*Castilleja cinerea*)
- Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*)

Several special status plants including ash-gray Indian paintbrush have been reported from the project site in prior botanical surveys (Michael Brandman Associates 2000; White & Leatherman BioServices 2002). White and Leatherman (2002) also mapped the extent of suitable habitat for ash-gray Indian paintbrush, based on the extent of its host plant, Wright's matting buckwheat. Bear Valley sandwort is reported from the site in the California Natural Diversity Data Base (California Department of Fish and Game 2007). None of the listed meadow species are known from the site.

V. METHODS

Scott D. White reviewed available literature to identify special status plants or plant communities known from the project site and vicinity. Literature sources included previous biological reports addressing the site (Michael Brandman Associates 2000; White & Leatherman BioServices 2002), the California Natural Diversity Data Base (California Department of Fish and Game 2007a, USGS Fawnskin, Big Bear City, Big Bear Lake, Butler Peak, Keller Peak, and Moonridge 7½' topo quads), California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (Tibor 2001), the CNPS *Electronic Inventory* (2007, for the same quads) and compendia of special status species published by the US Fish and Wildlife Service (2006) and California Department of Fish and Game (2007b). All species identified by this literature review, and others known from the general region, are included in Appendix 1 or 2 (attached). Appendix 1 lists those species not considered for this report due to elevational or geographic ranges, or specialized habitat requirements not found on the site. Appendix 2 lists special status species known from comparable habitats in the region and summarizes their natural history, conservation status, and occurrence probability on-site.

Scott D. White and Justin Wood (of Scott White Biological Consulting) visited the site on 30 April, 7 June, and 8 August 2007 to view special status habitats (pebble plains), compare present conditions with prior conditions, confirm presence of special status plants described from the site in prior reports, and to survey for additional special status plants not found during earlier surveys. During these visits we focused our attention on pebble plains and lakeshore areas, which could support listed threatened or endangered species. We walked over all pebble plain habitat on all three

field dates, and the entire length of the lakeshore on the project site on 30 April and 7 June. All plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in Hickman (1993), Munz (1974), Abrams (1923-1960), and other regional references. All species noted on the site are listed in Appendix 3.

In conformance with California Department of Fish and Game guidelines (2000), surveys were (a) conducted during flowering seasons for the special status plants known from the area, (b) floristic in nature, (c) consistent with conservation ethics, (d) systematically covered all habitat types on the site, and (e) well documented, by this report. However, due to very low rainfall in 2006-2007 (when current surveys were done) and 2001-02 (the year of previous White & Leatherman surveys), results of these field surveys should not be used to conclude "absence" for any special status plants not found.

White and Leatherman BioServices (2002) mapped pebble plain habitat and open upland habitat supporting Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*). That mapping is incorporated here as base maps for rare plant occurrences and habitat on the site.

VI. RESULTS

Utility of field surveys during 2007 was limited on this site and throughout southern California due to a very poor rainfall year. Previous botanical field work was completed during 2002, also a drought year. Many plant species are either annual (i.e., complete their life cycles in a single year and then die) or perennial herbs (i.e., die back to the ground level each year, and persist as underground bulbs or rootcrowns). In poor rainfall years, annual and perennial herbs may not be visible, though they may exist in the soil as inactive seed, bulbs, or rootcrowns. Most of the special status plants of the Big Bear area are perennial herbs (see text below), and we were not able to make conclusive determinations of "present" or "absent" based on these field surveys. Instead, we have used previous reports and our own judgement of habitat quality to estimate the probability that each special status plant might occur on the site.

VI. A. VEGETATION

VI. A. 1. Common Vegetation Types

Jeffrey pine forest: Most of the site above Highway 38 is covered by the Jeffrey pine series (Sawyer and Keeler-Wolf 1995). This vegetation also matches descriptions of Jeffrey pine forest (Holland 1986; McBride 1988), and montane coniferous forest (Munz 1959). Jeffrey pine forest covers most of the eastern half of the project site and occurs in patches interspersed with pebble plains (below) in the western half. Jeffrey pine (*Pinus jeffreyi*) is the dominant tree; white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occur throughout Jeffrey pine forest, at lower densities. The understory is sparse, consisting of scattered shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), cupleaf ceanothus (*C. greggii*), deer brush (*C. integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*C. ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbes in scattered patches. Jeffrey pine forest occurs in mountains throughout most of California at elevations between about 5000 and 9000 feet. Many local and regional associations have been described (Sawyer and Keeler-Wolf 1995).

Some, but not all, of the Jeffrey pine forest on the Moon Camp site provides suitable habitat for listed threatened or endangered plant species. In particular, areas of fairly open forest cover where Wright's matting buckwheat occurs are suitable for ash-gray paintbrush, a federally listed threatened species occurring in pebble plains (below) and open Jeffrey pine forest. These areas are identified on

Figure 3. Other special status plants, but not listed species, could also occur throughout the remainder of mapped Jeffrey pine forest.

Lake Shoreline: In the western half of the property, the site's southern boundary is at the shore of Big Bear Lake. Most plants along the shore itself are herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium ciliatum*), wire-grass (*Juncus arcticus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Numerous seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*) also occur there.

Just above the high-water level, there are small patches of various upland and wetland vegetation types. These patches are too small to map. Small areas of Jeffrey pine forest are interspersed with open wet meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*). There are no alkaline meadows or dry meadows (below) along the lake shore. Small patches of wet meadows may provide suitable habitat for several special status plants (below), but we were unable to determine whether they are present or absent due to poor rainfall.

VI. A. 2. Special-status Vegetation

Pebble Plain: Pebble plain occurs in a single patch at the crest of a hill, in the western portion of the site north of Highway 38 (Figure 3). Pebble plain (also called pavement plain) was described by Derby and Wilson (1978, 1979). A detailed discussion was prepared by the San Bernardino National Forest (1990) and brief descriptions appear in Holland (1986) and Sawyer and Keeler-Wolf (1995) . The substrate consists of clay soil with quartzite pebbles and gravel that are continually pushed to the surface, evidently through frost action (Holland 1986). Vegetation structure on these sites is similar to the mat-forming structure of alpine sites at much higher elevations. Vegetation consists largely of well-spaced cushion-forming perennials and a variety of tiny annuals. Bunchgrasses and some succulents may also occur. At least two species, both listed as endangered, are strictly endemic to Big Bear pebble plain habitats: Bear Valley sandwort and southern mountain buckwheat (Derby and Wilson 1978). Several other special status plants, including other listed threatened or endangered species, also occur on pebble plain habitat.

On the Moon Camp site, much of the pebble plain habitat has been disturbed by vehicles. This disturbance has reduced vegetation cover, disturbed the natural hydrologic pattern, and perhaps reduced habitat quality for special status plants (San Bernardino National Forest 1990). Based on National Forest management efforts at other sites, vehicle disturbance apparently does not permanently alter habitat suitability for these species. For example, the Forest Service has fenced degraded pebble plains in the Sugarloaf area and found that plant diversity returns after a few years.

Our habitat map (Figure 3) indicates pebble plains themselves, and also indicates adjacent open forest with high cover of Wright's matting buckwheat, where we observed suitable habitat for species which tend to occur in both pebble plains and adjacent open forest habitat.

Pebble plains of the Big Bear area (above) are classified as "southern montane black sagebrush pebble plains" by CDFG (2002), "a series or association considered rare and worthy of consideration" by the California Natural Diversity Data Base. Pebble plains on the project site support at least one listed threatened plant, possibly two other listed species, and three other special status plants.

Wet Meadow: Small patches of meadow occur along the lakeshore, south of Highway 38. They grade into upland grasslands, and we could not delineate their extent due to dry conditions. Meadows in the Big Bear Valley may be perennially saturated (i.e., "wet meadows") or may have

saturated soils only seasonally or during wet years (called "dry meadows," "xeric meadows," or "vernal meadows"). Meadows of the San Bernardino Mountains were described by Krantz (1994). They are generally dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.) and grasses (*Poa* spp., *Elymus* spp.). Dry meadows and the margins of wet meadows support sagebrush (*Artemisia tridentata, A. rothrockii*). These meadows themselves are not ranked as special status communities by CDFG (2002) but several locally endemic plants occur in them and they therefore are recognized locally as important habitats (Krantz, no date). Three listed threatened or endangered plants of wet meadow habitats could occur on the Moon Camp site, though only with low or moderate probabilities: bird's foot checkerbloom (*Sidalcea pedata*), San Bernardino bluegrass (*Poa atropurpurea*), and California dandelion (*Taraxacum californicum*). Other special status or listed species of pebble plains and their margins could also occur in meadow margins (e.g., ash-gray paintbrush).

VI. B. Special status plants

Plant or animal species identified by state or federal agencies or by private conservation organizations may be assigned special conservation status due to declining numbers, vulnerability to habitat change, or restricted distributions. Some species are listed as threatened or endangered under state or federal Endangered Species Acts. Other special status plants are included in the California Native Plant Society's *Inventory* or other compilations listed in the Methods section (above) and summarized in Appendix 2. Big Bear Valley has a high proportion of rare and locally endemic species (Krantz, no date; Krantz 1994). Each special status plant species is addressed in Appendix 1 or 2 (habitat and range, agency status and probability of occurring on the site). Species observed on the site and listed or candidate species potentially occurring on the site are also described below.

VI. B. 1. Listed threatened or endangered plants occurring on the site:

Ash-gray Indian paintbrush (*Castilleja cinerea*): Ash-gray Indian paintbrush is a federally-listed threatened species and is on CNPS's List 1B. It is a root parasite on other plants, often parasitizing the listed threatened southern Mountain buckwheat (below) or a similar but common mat-forming buckwheat (*E. wrightii* ssp. *subscaposum*). It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows and seeps, and open pinyon or Jeffrey pine forest between about 5,900 and 10,000 feet elevation. It is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). It was reported and mapped on the project site by Michael Brandman Associates (2000) and in the California Natural Diversity Data Base (2007). White & Leatherman BioServices (2002) found that it was more widespread than reported earlier, occurring in the pebble plains and open pine forests (Figure 3), where it appears to be parasitizing *Eriogonum wrightii* ssp. *subscaposum.* We confirmed these occurrences and noted no substantial changes to densities or distribution in 2007.

Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*): Southern mountain buckwheat is federally listed as threatened and is on CNPS's List 1B. It is a mat-forming woody perennial, generally flowering late in the season (between about June and August). It is endemic to pebble plains habitats in Big Bear and Holcomb valleys in the San Bernardino Mountains, between about 5800 and 7500 feet elevation. It often serves as a host plant for the hemi-parasitic *Castilleja cinerea* (above) and also is a food plant for a newly described locally-endemic San Bernardino blue butterfly. It is very similar to a more common plant, Wright's matting buckwheat (*E. wrightii* ssp. *subscaposum*), which is common on the project site. The two species are distinguished by presence or absence of branching in their inflorescences (Hickman 1993; Reveal 1989, 2005). We examined flowers and remains of dried inflorescences of mat-forming buckwheats throughout the project site

on each site visit. Most of them were either unidentifiable (due to absence of inflorescences) or were identified as Wright's matting buckwheat, based on their branching inflorescences. But on the mapped pebble plain (Figure 3), during the 8 August site visit, about 10-20% of the matting buckwheat plants had mostly (but not exclusively) unbranched inflorescences. Reveal (2005) noted that the two plants intergrade to some extent in Big Bear Valley and A. Sanders (pers. comm.) has made similar observations. We conclude that some of the matting buckwheats on pebble plains at the Moon Camp site are intergradations between the endangered southern mountain buckwheat and the common Wright's matting buckwheat.

VI. B. 2. Special status plants occurring on the site but not listed as threatened or endangered:

Parish's rock-cress (*Arabis parishii*): Parish's rock cress is CNPS's List 1B. It is a perennial herb that typically blooms in April or May. It occurs in pebble plains and other sites with heavy or rocky soils, including carbonate soils, within pinyon woodlands and montane forests between about 3,900 and 8,000 feet elevation. It is endemic to the San Bernardino Mountains. Suitable habitat occurs on the project site in areas shown as ash-gray paintbrush habitat on Figure 3. It has been reported from the site (CNDDB 2001). White & Leatherman BioServices (2002) observed it uncommonly, scattered throughout pebble plain and adjacent open forest habitat. We confirmed these occurrences and noted no substantial changes to densities or distribution in 2007.

Big Bear Valley woollypod (*Astragalus leucolobus*): Big Bear Valley woollypod is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in rocky soils of montane conifer forests and woodlands and pebble plains, between about 5,600 and 8,000 feet elevation. It is endemic to the high mountains of southern California (San Bernardino, San Gabriel, San Jacinto, and Santa Rosa Mountains). Suitable habitat is found throughout the site. White & Leatherman BioServices (2002) observed it occasionally throughout the project site. We confirmed these occurrences and noted that it was especially common on pebble plains in 2007.

Heckard's paintbrush (*Castilleja montigena, C. applegateii* ssp. *martinii*): Heckard's paintbrush is on CNPS's List 4. It is a perennial herb, typically flowering between May and August. It occurs in montane forests between about 6400 and 9200 feet elevation. It is endemic to the San Bernardino Mountains, where it is common in forest habitats throughout the mountain range. It was originally described by Lawrence Heckard (1980), but Heckard regarded it as a minor variant of *Castilleja applegateii* and not as a distinct species in his Jepson Manual treatment of the genus (1993). It occurs occasionally in Jeffery pine forest on the Moon Camp site.

Silver-Haired ivesia (*Ivesia argyrocoma*): Silver-haired ivesia is on CNPS's List 1B. It is a perennial herb that typically blooms between June and August. It occurs in alkaline meadows and seeps, pebble plains, and montane forest between about 4900 and 8800 feet elevation. It occurs in the San Bernardino Mountains and a disjunct site in the mountains of Baja California. It has been reported from the project site by Michael Brandman Associates (2000) and White and Leatherman BioServices (2002), and we observed it throughout areas shown as ash-gray paintbrush habitat on Figure 3.

VI. B. 3. Listed and candidate threatened or endangered plants potentially occurring on the site:

Bear Valley sandwort (*Arenaria ursina*): Bear valley sandwort is federally-listed as threatened and is on CNPS's List 1B. It is a perennial herb and typically blooms between May and August. It occurs on pebble plains and sometimes on carbonate soils, between about 6,400 and 6,900 feet elevation. It is endemic to Big Bear Valley in the San Bernardino Mountains. It has been reported from the Moon Camp site (CNDDB 2007), but we did not find it on the site in 2007 and it was not noted there by Michael Brandman Associates (2000) or White & Leatherman BioServices (2002).

Due to poor rainfall in 2001-02 and 2006-07, we cannot evaluate whether Bear Valley sandwort was absent during these field surveys due to its disappearance from the site or due to drought-induced dormancy. Suitable habitat occurs in pebble plains on the project site, and we conclude that it has a high probability of occurring.

San Bernardino bluegrass (*Poa atropurpurea*): San Bernardino bluegrass is a federally-listed Endangered species and is on CNPS's List 1B. It is a rhizomatous perennial grass that typically flowers between May and June. It occurs in mesic meadows and seeps between about 4,400 and 8,100 feet elevation. It is known only from the San Bernardino Mountains and Laguna mountains (San Diego County). Marginally suitable habitat occurs along the lakeshore areas on the project site. We did not find it during our field surveys, but we also could not find it at a known occurrence in the area, perhaps due to drought-induced dormancy. Based on habitat, we conclude there is a low probability that it may occur there.

Bird's foot checkerbloom (*Sidalcea pedata*): Bird's foot checkerbloom is a federally- and state-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in meadows and seeps, between about 5,200 and 8,100 feet elevation. It is endemic to the San Bernardino Mountains. Marginally suitable habitat occurs near the lakeshore, though we did not find bird's foot checkerbloom during our field surveys, and it has not been reported there in prior surveys. Based on habitat, we conclude there is a low probability that it may occur.

California dandelion (*Taraxacum californicum*): California dandelion is a federally-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It is endemic to the San Bernardino Mountains, occurring only in and around Big Bear Valley, in meadows and seeps between about 6,300 and 7,800 feet elevation. Marginally suitable habitat occurs in meadow areas near the lakeshore, though the species was not noted during our field surveys or reported in prior surveys. Based on habitat, we conclude there is a low to moderate probability that it may occur on the site.

VI. B. 4. Special status plants potentially occurring but not listed as threatened or endangered:

Other special status plant species judged as moderate or greater probability of occurring on the site, but not seen during field surveys and not listed as threatened or endangered are listed below. See also Appendix 2.

Rock sandwort (*Arenaria lanuginosa* ssp. *saxosa*): Moderate probability (meadow, lakeshore)
Crested milk vetch (*Astragalus bicristatus*): High probability (rocky areas)
Big Bear Valley milk vetch (*Astragalus lentiginosus* var. *sierrae*): High probability, open forest
Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*): Moderate probability, meadow
Western sedge (*Carex occidentalis*): Moderate probability, meadow
San Bernardino Mountain owl's clover (*Castilleja lasiorhyncha*): Moderate probability, meadow
San Bernardino Mountains dudleya (*Dudleya abramsii* ssp. *affinis*): Moderate probability, pebble plains
Southern Sierra woolly sunflower (*Eriophyllum lanatum* var. *obovatum*): High probability, forest
Jepson's bedstraw (*Galium jepsonii*): High probability, forest
Johnston's bedstraw (*Galium johnstonii*): Low to moderate probability, forest
Parry's sunflower (*Hulsea vestita* ssp. *parryi*): Low to moderate probability (open slopes)
Duran's rush (*Juncus duranii*): Moderate probability, meadow
Short-sepaled lewisia (*Lewisia brachycalyx*): Moderate probability, meadow
Baldwin Lake linanthus (*Linanthus killipii*): High probability on pebble plains

San Bernardino Mountain monkeyflower (*Mimulus exiguus*): High probability, meadow margin, etc.
Purple monkeyflower (*Mimulus purpureus*): High probability, meadow margin, etc.
Chickweed oxytheca (*Oxytheca caryophylloides*): High probability, open forest
Parish's yampah (*Perideridia parishii* ssp. *parishii*): Low to moderate probability, meadow
Transverse Range phacelia: (*Phacelia exilis*): High probability, meadow margin, etc.
Mojave phacelia (*Phacelia mohavensis*): High probability, meadow margin, etc.
Bear Valley phlox (*Phlox dolichantha*): High probability, throughout
Bear Valley pyrrocoma (*Pyrrocoma uniflora* ssp. *gossypina*): Low - moderate probability, meadow
Parish's rupertia (*Rupertia rigida*): High probability, throughout
Tehachapi ragwort (*Senecio ionophyllus*): Moderate probability, throughout
Laguna Mountains jewelflower (*Streptanthus bernardinus*): Moderate probability, forest
Southern jewelflower (*Streptanthus campestris*): High probability, forest
Pine green-gentian (*Swertia neglecta*): High probability, forest
Small-flowered bluecurls (*Trichostema micranthum*): High probability, meadow

VI. C. PROTECTED PLANTS

The San Bernardino County Plant Protection and Management policy (2007) regulates removal of native trees greater than 6 inches diameter at breast height (dbh). Jeffrey pines and other native forest trees greater than 6 inches dbh occur throughout the site.

VII. IMPACTS

VII. A. Impacts to Special Status Plants and Habitat

Project construction would result in grading new roads, driveways and building pads throughout most of the property, removing much of the native vegetation, including special status plants and habitat, and disturbing soils throughout most of the site. Even where special status plants are not removed by grading, most future land uses on individual lots (e.g., landscaping) would not be subject to environmental review and would cause further loss of these plants and habitats. Indirect project impacts (i.e., impacts outside the proposed residential lots and limits of grading) would affect rare plant habitat in a proposed set-aside area and, if it occurs, off-site to the north. Thus, project impacts would eliminate or degrade sensitive habitat types (pebble plain) and occupied rare plant habitat (Figure 3, Figure 5). Pebble plains and open forest patches on the site are occupied by at least one threatened or endangered plant (ash-gray Indian paintbrush); genetic intergrades of another listed plant (southern mountain buckwheat) with a common related species; and four other special status plants (Parish's rock-cress, Heckard's paintbrush, Bear Valley woollypod and silver-haired ivesia). Development would eliminate or substantially reduce numbers of all five plants. Although these habitats are somewhat degraded by vehicles and invasive plants (see Section VI. A. above and "edge effects," below), adverse impacts to listed species would meet the CEQA threshold for mandatory findings of significance.

Construction could also eliminate or substantially reduce numbers of five other listed threatened or endangered plants that could occur on the site but were not found there, including Bear Valley sandwort, southern mountain buckwheat, bird-foot checkerbloom, San Bernardino bluegrass, and California dandelion. The maximum possible extent of these impacts, if all four plants occur, would be loss of Bear Valley sandwort and southern mountain buckwheat in pebble plains areas discussed above, and possible loss of bird-foot checkerbloom, San Bernardino bluegrass, and California dandelion from small meadow areas bordering the lakeshore. These impacts would meet the CEQA threshold for mandatory findings of significance if any of these listed plants occur on the site.

Impacts to special status plants not listed as threatened or endangered (Section IV. B. 4.) generally would not meet the CEQA threshold for mandatory findings of significance.

Adverse project impacts to pebble plains and rare plants occurring (or potentially occurring) on pebble plains are somewhat reduced by the project's design, which designates an open space lot on the pebble plain area and part of the occupied ash-gray Indian paintbrush habitat (Figure 3). However, the long-term conservation value of the proposed open space lot would be minimal without designating buffer areas and providing for active on-site land management to prevent indirect "edge effects" of existing and proposed new adjacent land uses.

The term "edge effect" describes the effects of developed land uses on adjacent natural habitat areas (e.g., habitat adjacent to new development or in set-aside areas surrounded by development). To date, most analyses of edge effects on habitat reserves have focused on sensitive wildlife species. The following discussion of edge effects on rare plants is based on an analysis by the Conservation Biology Institute (2000) addressing San Fernando Valley spineflower, an endemic southern California species threatened by development and surrounding land uses in Los Angeles and Ventura Counties. Rare plants near developed lands tend to die out due to a variety of edge effects, including:

- Exclusion by invasive weedy plants introduced deliberately or accidently into developed landscapes.
- Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation.
- Altered hydrology caused by irrigation overspray, road runoff, or water diversions installed for erosion control.
- Direct damage by pets and feral animals (e.g., digging by dogs and cats).
- Indirect effects of non-native animals, such as elimination of native pollinators by invasive Argentine ants.
- Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes.
- Pollution from oversprayed or runoff landscaping chemicals (insecticides, herbicides, fertilizers).

Conservation planners design "buffer areas" to separate managed sensitive species or habitat reserve areas from the indirect effects of adjacent land uses. The Conservation Biology Institute (2000) modeled "buffer areas" for then-proposed San Fernando Valley spineflower preserve areas in Ventura County. In their analysis, buffer areas were defined as preserved land surrounding the rare plants, where land uses were strictly limited to activities consistent with reserve management. For example, buffer areas function to separate rare plant habitat from adverse effects of weeds propagating along trails or through fuel modification zones. Thus, roads, trails, or fuel modification land uses are not consistent with buffer function. The Conservation Biology Institute analysis (2000) estimated that buffer widths of 200 feet would be "highly likely to be effective" in buffering San Fernando Valley spineflower occurrences from a series of adverse edge effects from adjacent land uses, and "moderately effective" against two adverse edge effects (invasive animals and increased fire frequency). In their analysis, a wider hypothetical buffer (300 ft.) would not increase estimated effectiveness against fire and invasive animals. We therefore use 200 feet as the best available estimate of the range of adverse edge effects on special status plant occurrences.

The proposed project could also cause "edge effects" to proposed open space on-site and to adjacent vacant land to the north and east as new residents increase activity and disturbance to surrounding native habitat, through the effects listed above.

Most land surrounding the Moon Camp site is in private ownership, except in the northeastern

corner where National Forest land is adjacent to the north and east. None of the surrounding private land is managed or proposed for management as a conservation area. Most adjacent private land on all sides has been developed. There is a pebble plain area on National Forest land on the ridge north of the Moon Camp site, but it is more than 200 feet from the project site and thus should be sufficiently buffered from project-related edge effects. We conclude that the proposed project's off-site edge effects would not meet the CEQA threshold for mandatory findings of significance.

Much of the Moon Camp project site, including the proposed open space lot on-site, is now subject to edge effects of adjacent residential development and roads, especially Highway 38 (Figure 4). The proposed project would eliminate or further degrade most remaining occupied rare plant habitat (above) and would indirectly affect nearly all of the proposed open space lot by introducing new edge effects closer to the open space area (Figure 5). The small portion of the proposed open space lot not within 200 feet of proposed new development is already within 200 feet of Highway 38 and thus subject to existing edge effects (Figures 4 and 5).

VII. B. Impacts to Protected Plants

Tract Map approval and subsequent construction would cause substantial reduction in Jeffrey pine forest tree canopy cover throughout most of the site. This impact would not necessarily be regarded as significant under CEQA, but could conflict with San Bernardino County's general plan and would require permitting under the County's Native Plant Protection policy.

VII. C. Impacts to Jurisdictional Streambeds

Road construction and other elements of the project would alter ephemeral channels, and possibly to meadows or other lakeshore habitat that may meet state or federal jurisdictional criteria as streambeds, wetlands, or waters of the United States. These impacts would not necessarily be regarded as significant under CEQA, but could require permitting under Section 1603 of the California Fish and Game Code or Section 404 of the federal Clean Water Act through the California Department of Fish and Game or US Army Corps of Engineers, respectively.

VIII. RECOMMENDED AGENCY CONSULTATION OR FURTHER STUDIES

1. To minimize loss of forest canopy on the property, we recommend mapping and inventorying trees on the site, and designing roads and building sites to minimize the number of overstory trees to be removed. Once those trees that must be removed are identified, we recommend applying to San Bernardino County for applicable permits under the County's native plant protection policy.

2. We recommend preparing a delineation of jurisdictional streambeds, wetlands, and waters of the United States to determine whether Section 1603 of the California Fish and Game Code or Section 404 of the federal Clean Water Act are applicable on the property. The delineation report should address channels crossing the site and the lakeshore area described in this report.

3. The project would take at least one federally listed plant (ash-gray Indian paintbrush) and its occupied habitat through direct impacts (occurrences within proposed roadways or residential lots) and possibly two other federally listed plants (Bear Valley sandwort and southern mountain buckwheat) through indirect impacts to the proposed open space lot. If project development requires permitting or funding through any federal agency (e.g., the Army Corps of Engineers under Section 404 of the federal Clean Water Act) then that agency must consult with the US Fish and Wildlife Service under Section 7 of the federal Endangered Species Act.

4. Field surveys to date have occurred in very dry years and have been unable to determine presence or absence of several listed threatened or endangered plants and numerous other special status plants. We recommend further botanical surveys for these species (Sections V. B. III. and V.

B. IV., above) , to be conduced in accordance with California Department of Fish and Game (2000) guidelines. These follow-up surveys should be done in a year when precipitation is at least 40% of average for the area over the "rainfall year" period (1 July - 30 June).

IX. MITIGATION AND MONITORING RECOMMENDATIONS

IX. A. MITIGATION RECOMMENDATIONS

Under CEQA Guidelines, if a project would "reduce the number or restrict the range of a threatened or endangered species," then a lead agency must find that the project would have a significant effect. Without mitigation, the proposed development would meet this criterion for mandatory findings of significance, due to adverse impacts to the threatened ash-gray Indian paintbrush, and potential adverse impacts to listed plants not found on the site. CEQA defines mitigation as (a) avoiding the impact altogether by not taking a certain action or parts of an action, (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation, (c) rectifying the impact by repairing, rehabilitating, or restoring the impacted environment, (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, or (e) compensating for the impact by replacing or providing substitute resources or environments. Potential application of these five types of mitigation to the proposed project are addressed below:

Avoidance or Minimization: Avoiding or minimizing impacts to the occupied listed plant habitat would necessitate either abandoning the project or redesigning it to eliminate or minimize grading or other disturbance (including long-term edge effects of new development) to soils and hydrology on the occupied habitat and throughout a substantial buffer area. These measures would substantially reduce project feasibility and, even if implemented, long term persistence of the listed plants would be doubtful due to isolation caused by existing and proposed development.

Rectifying the impact or reducing it over time: Both these types of mitigation apply only to temporary disturbances (e.g., pipeline construction, in which the disturbed ground may be revegetated following construction). These measures are not applicable for the proposed Moon Camp project.

Compensating for the impact: Compensation is widely used as mitigation for impacts to threatened or endangered species, both as mitigation for CEQA analysis and as Habitat Conservation Plans (HCPs) negotiated with the US Fish and Wildlife Service under the federal Endangered Species Act, if protection of sufficient off-site habitat can be achieved. Typically, mitigation ratios are about 3:1 (i.e., 3 acres of habitat purchased or protected for each acre lost to development).

Off-site protection is a viable measure for impacts to ash-gray Indian paintbrush and other regionally endemic threatened or endangered plants potentially occurring on the site. The San Bernardino National Forest actively manages other sites to preserve pebble plain endemic plants, including ash-gray paintbrush. Numerous other privately-owned sites in the Big Bear Valley support pebble plains where disturbances would be more manageable due to adjacent land uses and relative isolation from developed areas. The California Wildlife Foundation has established a fund, administered by the California Department of Fish and Game, for eventual purchase or protection of pebble plain habitat in the Big Bear area.

We recommend the following measures to mitigate significant or potentially significant adverse impacts to listed threatened or endangered plants:

1. We recommend compensating for anticipated loss of a federally-listed threatened plant (ash-gray Indian paintbrush), loss of pebble plain habitat, and potential impacts to other listed species (Bear Valley sandwort, southern mountain buckwheat) by contributing to the funding of purchase

and management of off-site habitat through the California Wildlife Foundation fund, described above, at a level sufficient to purchase or protect 3 acres of habitat for each acre of pebble plain habitat and ash-gray Indian paintbrush habitat to be developed, and at 1:1 ratio for habitat to be indirectly degraded by edge effects of the proposed development (see Figure 5).

2. If follow-up surveys (Section VIII., above) determine that no other listed plants occur, then we make no further mitigation recommendation. If the surveys determine that one or more listed species occurs in the meadow area, then we recommend delineating the extent of suitable or occupied habitat, evaluating direct or indirect project impacts, and compensating as stated above for impacts to rare plant habitat (i.e., 3:1 for direct impacts, 1:1 for indirect impacts or edge effects).

IX. B. MITIGATION MONITORING RECOMMENDATIONS

California law requires monitoring of mitigation measures imposed under CEQA. We recommend monitoring mitigation measures recommended here to verify compliance with conditions of approval. We recommend that the applicant maintain files of all correspondence with agencies, contractors, or other entities pertaining to compliance with the recommendations above (Section VIII and IX.A.), and provide copies of pertinent correspondence to the County upon completion or resolution of each recommendation.

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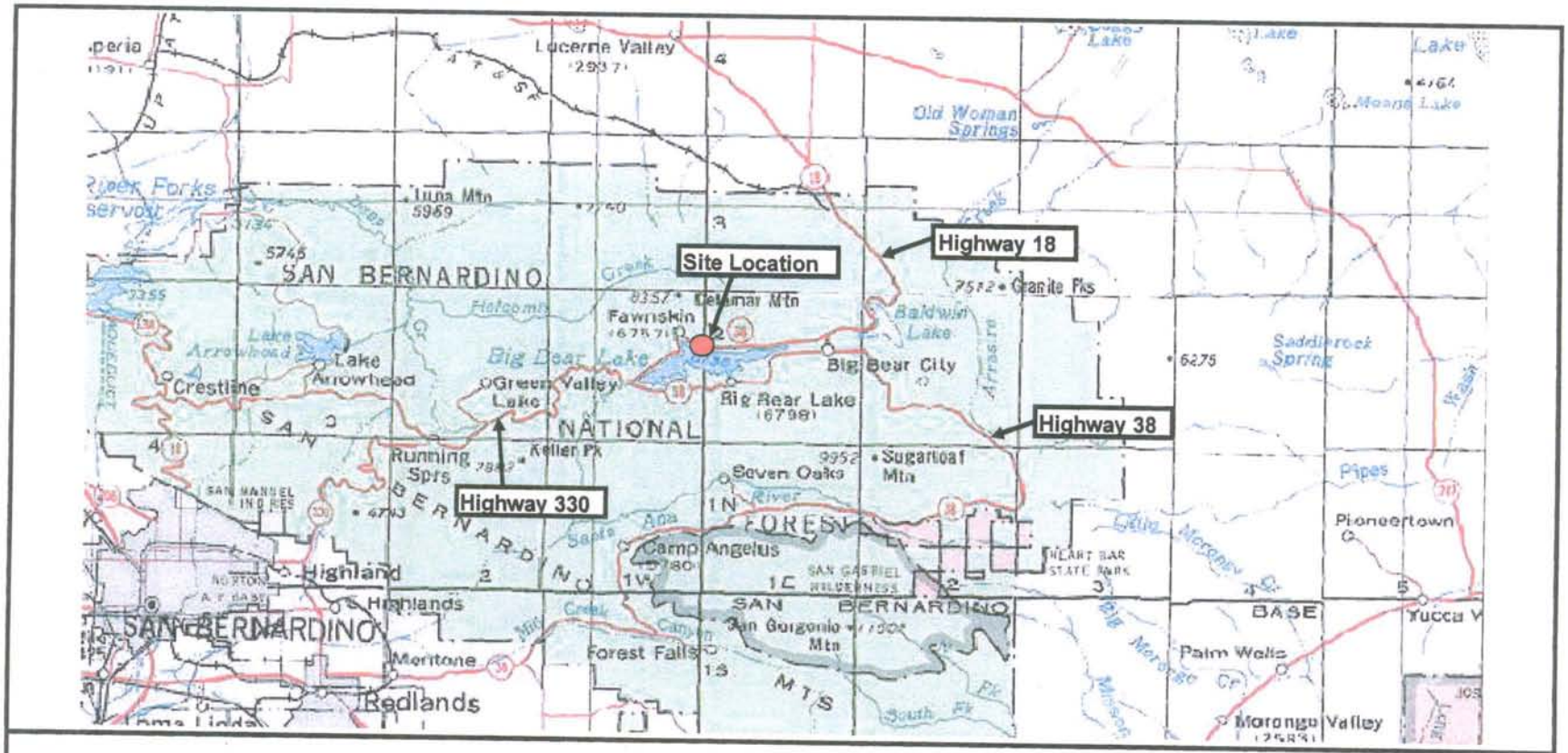
Figure 1:
Vicinity Map



Proposed Moon Camp Tenative Tract

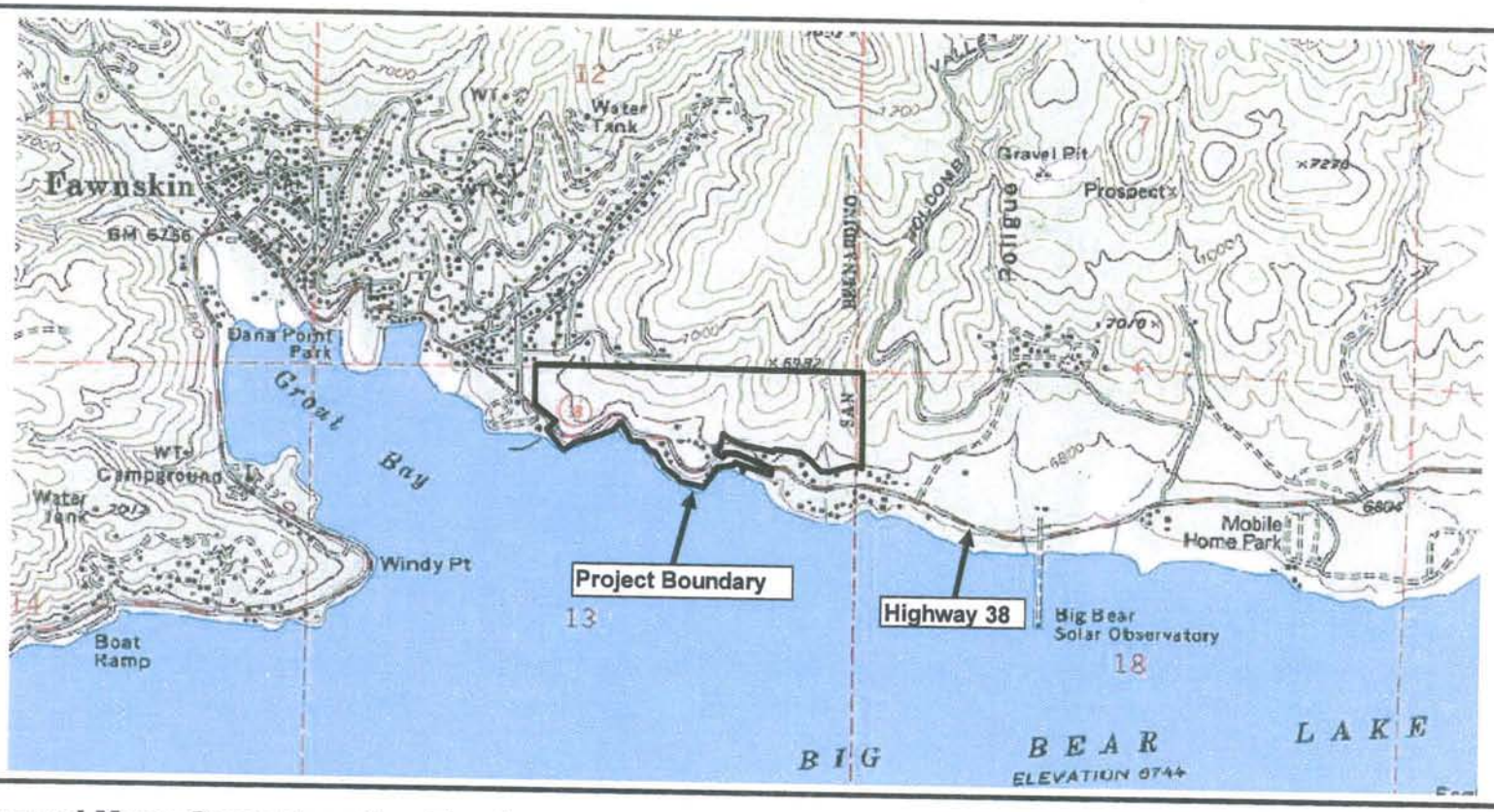
Figure 1: Vicinity Map

Scott White Biological Consulting

Map source: TOPO! 7½ minute topographic
JW: 15 Aug 2007

NORTH

Figure 2:
Project Site Map



Proposed Moon Camp Tenative Tract

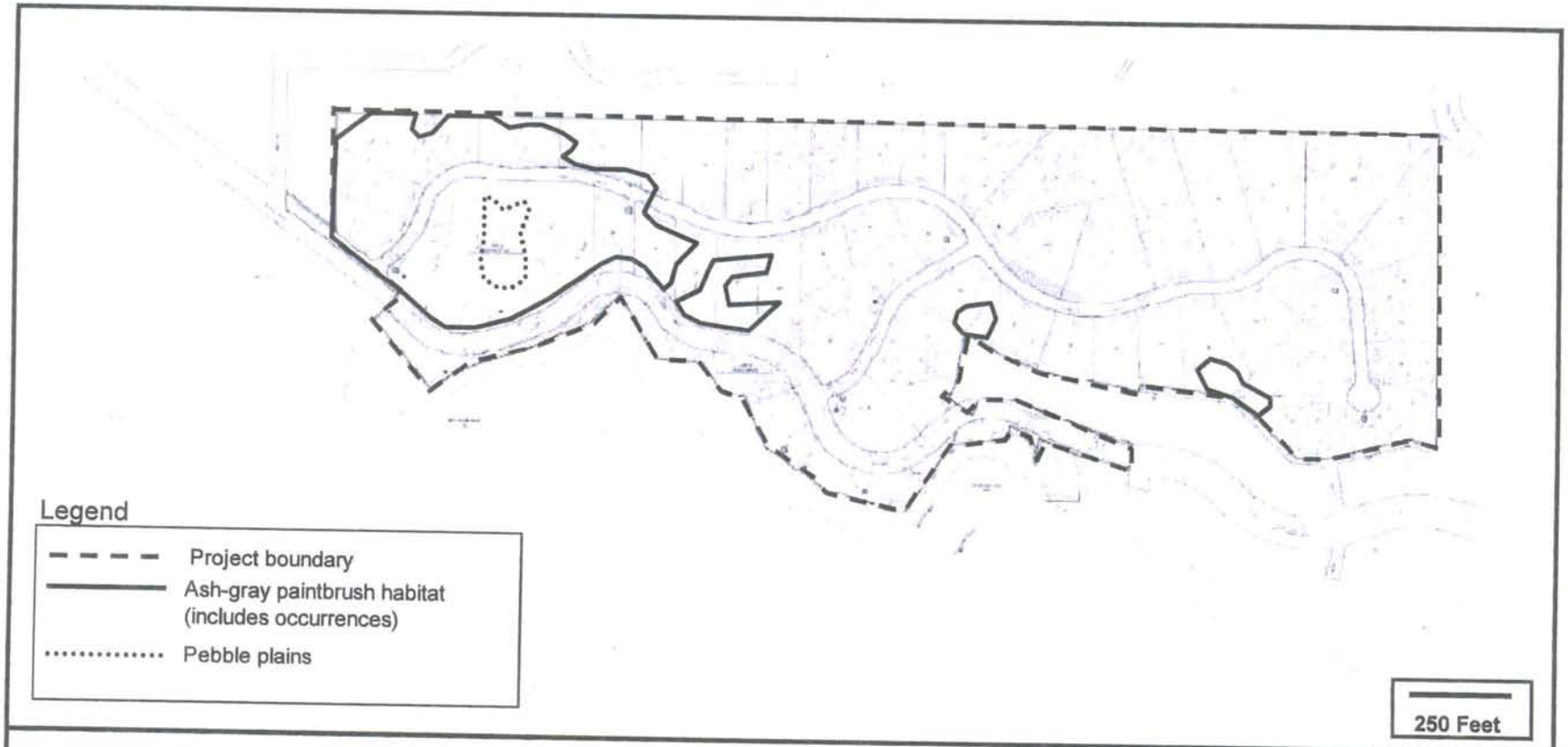
Figure 2: Site Map

Scott White Biological Consulting

Map source: TOPO! 7½ minute topographic, Fawnskin, CA
JW: 15 Aug 2007

NORTH

Figure 3:
Rare Plant Habitat



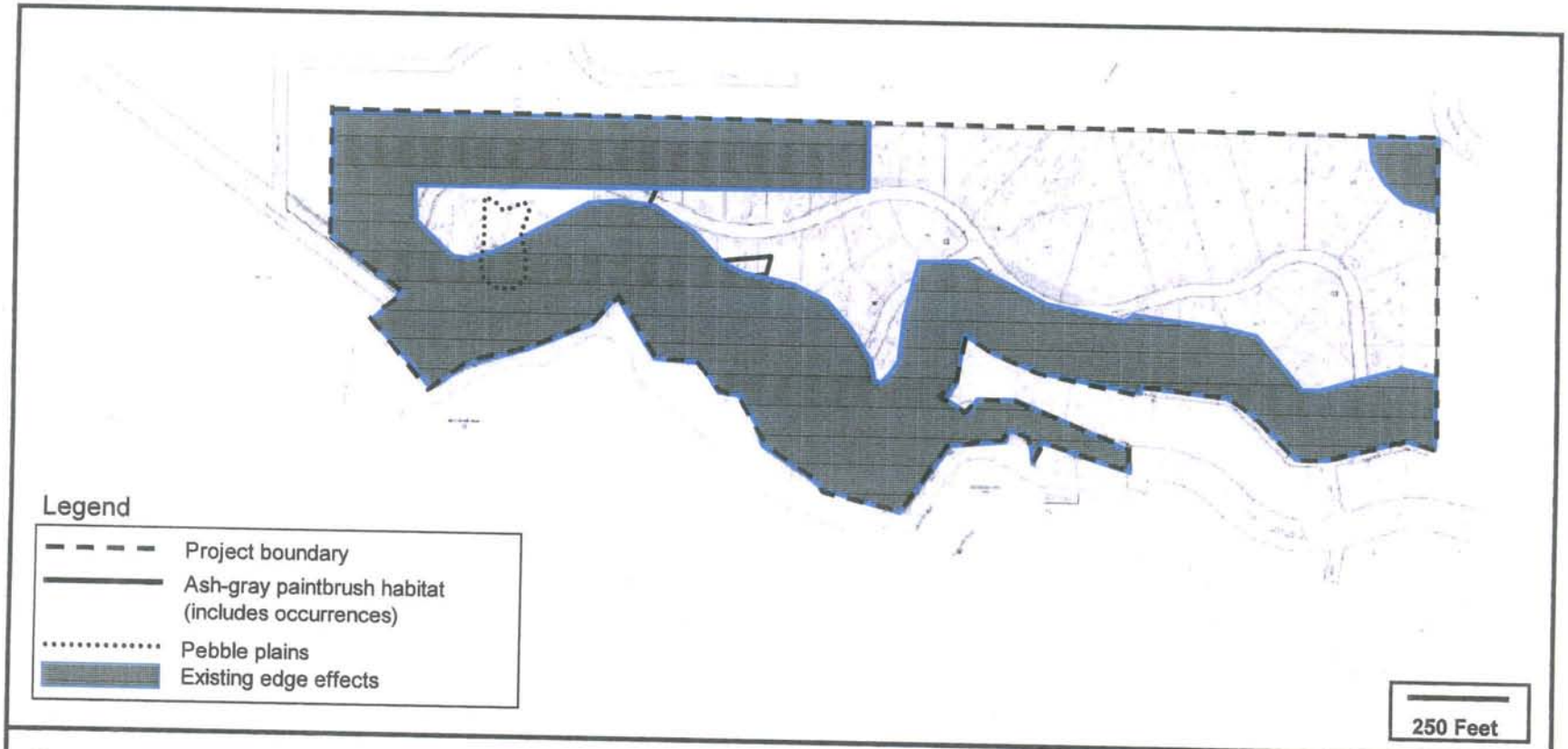
Proposed Moon Camp Tenative Tract

Figure 3: Rare Plant Habitat

Scott White Biological Consulting

Map source: Michael Brandman Associates
JW: 15 Aug 2007

Figure 4:
Edge Effect Map



Proposed Moon Camp Tenative Tract

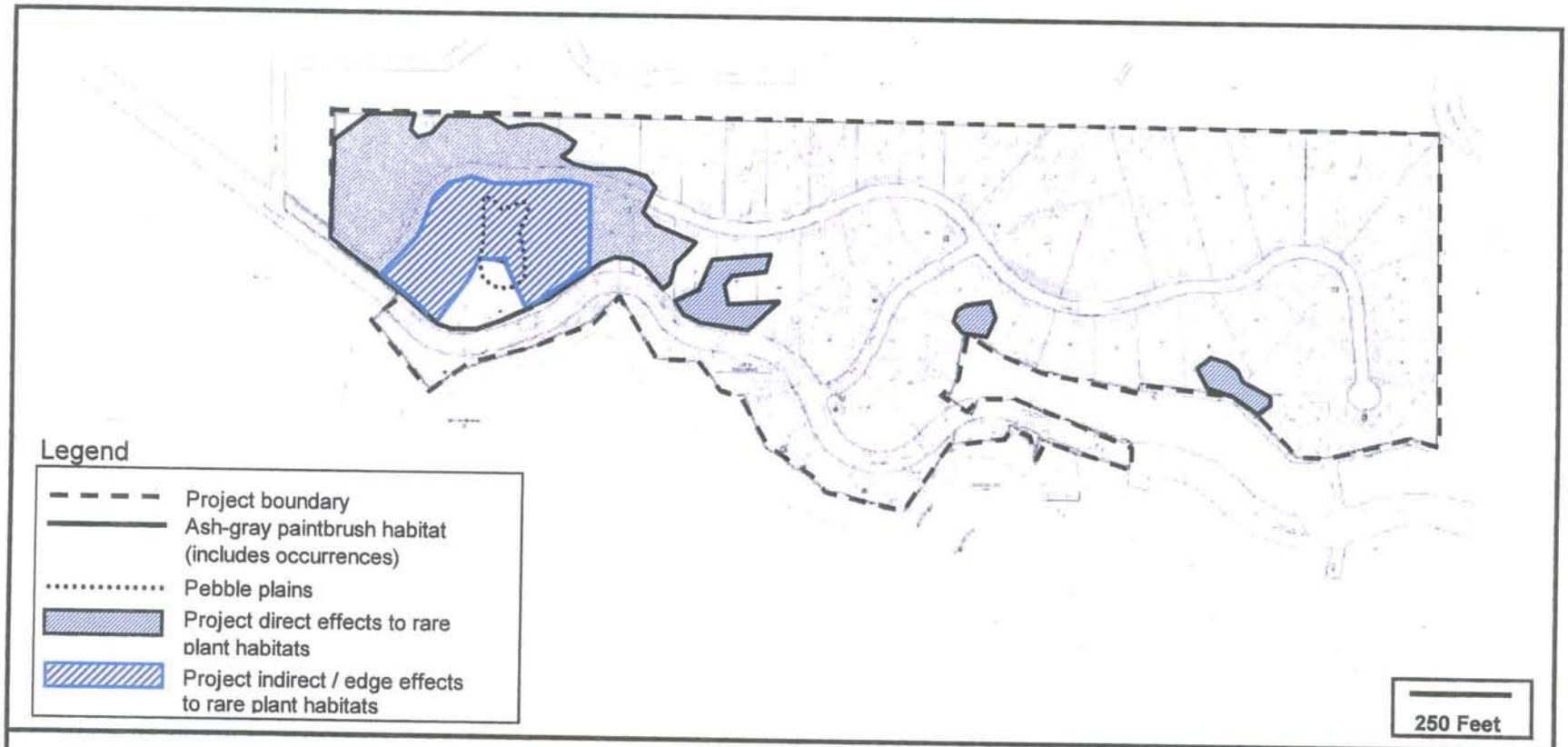
Figure 4: Existing Edge Effects

Scott White Biological Consulting

Map source: Michael Brandman Associates

JW: 15 Aug 2007

Figure 5:
Project Effects



Proposed Moon Camp Tenative Tract

Figure 5: Project Effects

Scott White Biological Consulting

Map source: Michael Brandman Associates
JW: 15 Aug 2007

Appendix 1:
Special Status Species Not Addressed

Appendix 1: Special status plants of the Bear Valley region not addressed due to habitat or range.

Common name	Latin name	Reason for exclusion
White-margined everlasting	Antennaria marginata	Outside geogr. range (only local occurrences in Barton Flats area)
Pinyon rock-cress	Arabis dispar	Outside geogr. range (only local occurrences on desert-facing slopes)
Shockley's rock-cress	Arabis shockleyi	Outside geogr. range (only local occurrences on desert-facing slopes)
Cushenbury milk-vetch	Astragalus albens	No suitable habitat (carbonate)
Triple-ribbed milk-vetch	Astragalus tricarinatus	No habitat (desert shrubland), well above elev. range (below about 4000 ft.), Cushenbury Cyn report erroneous
Parish's small-scale	Atriplex parishii	No suitable habitat (alkali sink)
Fremont barberry	Berberis fremontii	No local occurrences (presumed extinct in Cushenbury area)
Scalloped moonwort	Botrychium crenulatum	No suitable habitat (marshes, bogs)
Plummer's mariposa lily	Calochortus plummerae	Above elev. range (below about 5500 ft.)
Alkali mariposa lily	Calochortus striatus	No habitat (desert alkaline meadows, seeps) above elev. range (below about 5300 ft.)
Parish's daisy	Erigeron parishii	No suitable habitat (carbonate)
Cushenbury buckwheat	Eriogonum ovalifolium var. vineum	No suitable habitat (carbonate)
Moss gentian	Gentiana fremontii	Well below elev. range (occurs in San Gorgonio Wilderness)
Los Angeles sunflower	Helianthus nuttallii ssp. parishii	Well above elev. range (below about 4000 ft. elev.)
Barton Flats horkelia	Horkelia wilderae	Outside geogr. range (endemic to Barton Flats area)
California satintail	Imperata brevifolia	Well above elev. range (below about 3000 ft.)
San Bernardino Mtn. bladderpod	Lesquerella kingii ssp. bernardinus	No habitat (carbonate)
Adder's mouth	Malaxis monophyllos ssp. brachypoda	Well below elev. range (occurs in San Gorgonio Wilderness)
Cienega Seca oxythexca	*Oxytheca parishii* var. *cienegensis*	Outside geogr. range (known only from Cienega Seca and Pipes Cyn areas)
Cushenbury oxytheca	Oxytheca parishii var. goodmaniana	No habitat (carbonate)

Appendix 1: Special status plants of the Bear Valley region not addressed due to habitat or range.

Common name	Latin name	Reason for exclusion
Frosted mint	Poliomintha incana	No suitable habitat (desert dunes and sandy flats)
Narrow-leaved cottonwood	Populus angustifolia	No San Bernardino Mountain occurrences (local reports unverified)
Latimer's woodland gilia	Saltugilia latimeri	No habitat (desert shrubland,pinyon woodland); above elev. range (below about 6200 ft.)
Slender-petaled thelypodium	Thelypodium stenopetalum	No habitat (alkaline meadows)

Appendix 2:
Special Status Species

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Abronia nana ssp. *covillei* Coville's dwarf abronia	Perennial herb; carbonate and sandy soils within pinon-juniper woodlands; San Bernardino Mts. and mountains of E Mojave, about 5200 - 10,200 ft.	May - August	Fed: none Calif: S3.2 CNPS List 4.2	Low (marginally suitable habitat)
Allium parishii Parish's onion	Bulb; open shrubland & woodland, gen. sandy bajadas or mtn slopes, often carbonate soil, about 3000 - 5500 ft. elev.; N San Bern Mtns and Moj Des Mtns, to W Ariz.	Apr - May	Fed: none Calif: S3.3? CNPS List 4.3	Minimal (above elev. range)
Arabis parishii Parish's rock cress	Perennial herb; pebble plains, occas. on carbonate soil; open dry sites in conifer forest; about 5800 - 9500 ft. elev.; San Bernardino Mtns. endemic	April - May	Fed: none Calif: S2.1 CNPS List 1B. 2	Occurs (2007 survey; NDDB report)
Arenaria lanuginosa ssp. *saxosa* (*A. confusa*) Rock sandwort	Perennial herb; sandy soils, streams or meadows; about 5900 to 8600 ft. elev.; San Bernardino Mtns, W US and N Baja Calif.	July - Aug	Fed: none Calif: S1.3 CNPS List 2.3	Moderate (moderately suitable habitat)
Arenaria ursina Bear Valley sandwort	Perennial herb, pebble plains, occas. on carbonate soils, about 5900 - 9500 ft. elev.; San Bernardino Mtns. endemic	June - July	Fed: **THR** Calif: S 2.1 CNPS: List 1B.2	Occurs? (NDDB record #23)
Aster bernardinus (*Symphyotrichum defoliatum*) San Bernardino aster	Perennial herb; wetlands and margins, near sea level to about 6700 ft. elev.; formerly widespread, Kern Co to San Diego Co, but most sites extirpated	July - Nov	Fed: none Calif: S 3.2 CNPS List 1B.2	Low (field surveys; upper margin of elev. range)
Astragalus bicristatus Crested milk vetch	Perennial herb; rocky slopes, montane conifer forest; about 5500 - 9000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	May - August	Fed: none Calif: S3.3 CNPS List 4.3	High (suitable habitat occurs)
Astragalus lentiginosus var. *sierrae* Big Bear Valley milk vetch	Perennial herb; open rocky soils or compacted areas in pine forest; about 5900 - 8500 ft. elev.; San Bernardino Mtns endemic	April - August	Fed: none Calif: S1? CNPS List 1B.2	High (suitable habitat occurs)
Astragalus leucolobus Bear Valley woollypod	Perennial herb; open or disturbed soils, pine forests and sagebrush scrub, about 5600-8800 ft. elev.; San Gabriel Mtns to Santa Rosa Mtns	May - July	Fed: none Calif: S 2.2 CNPS List 1B.2	Occurs
Calochortus palmeri vars. *palmeri* and *munzii* Palmer's & Munz's mariposa lilies	Bulb; meadows or seasonally moist sites; about 3300 - 7200 ft. elev.; var. *palmeri* occurs S Coast & Transverse Ranges, reported but not verified San Jacinto Mtns; var. *munzii* endemic to San Jacintos, reported but not verified in San Bernardinos	May - July	Fed: none CNPS List 1B.2 var *palmeri*: Calif: S 2.1 var. *munzii*: Calif: S 1.2	Moderate (marginally suitable habitat)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Carex occidentalis Western sedge	Rhizomatous perennial; meadows & seeps; San Bernardino Mtns, White Mtns, scattered in western states; about 6200 - 10,300 ft. elev.	June - Aug	Fed: none Calif: S2S3 CNPS List 2.3	Moderate (marginal habitat)
Castilleja cinerea Ash-gray Indian paintbrush	Perennial herb; pebble plains, dry meadows, about 5900 to 9100 ft. elev.; partially parasitic usually on matting buckwheats; San Bernardino Mtns endemic	May - August	Fed: THR Calif: S2.2 CNPS List 1B.2	Occurs (field survey and CNDDB report)
Castilleja lasiorhyncha (*Orthocarpus lasiorhynchus*) San Bernardino Mountain owl's clover	Annual; meadows, streamsides, seeps, etc., about 4200-7800 ft. elev.; San Bernardino Mtns. and (historically) San Jacinto Mtns.; reports from San Diego Co. unconfirmed	June - Aug	Fed: none Calif: S2.2 CNPS List 1B.2	Moderate (marginal habitat)
Castilleja applegateii ssp. *martinii* × *C. angustifolia* (=*C. montigena, C. martinii* var. *ewanii*) Heckard's paintbrush	Perennial herb; conifer forest; San Bernardino Mountains endemic (treated as a species by CNPS but considered a hybrid by Chuang & Heckard in Jepson Manual)	March - July	Fed: none Calif: S3.3 CNPS List 4.3	Occurs (Jeffrey pine forest)
Dryopteris filix-mas Male fern	Perennial herb; widespread in N hemisphere, esp. at high latitudes; only two reports in Calif., incl. Holcomb Valley	July - Sept.	Fed: none Calif: S 1.3 CNPS List 2.3	Low (local rarity)
Dudleya abramsii ssp. *affinis* San Bernardino Mts. dudleya	Perennial herb, pebble plains & rock outcrops (often carbonate); pinyon woodland, open pine forests, about 5200-8500 ft. elev.; San Bernardino Mtns endemic	April - June	Fed: none Calif: S 2.2 CNPS: List 1B.2	Moderate (marginal habitat)
Eriogonum foliosum (*E. evanidum*) Leafy buckwheat	Annual; sandy soil, woodlands or shrublands; about 3900-7200 ft. elev.; scattered locations, Big Bear Valley to N Baja Calif.; may be extinct in Calif.	July - Oct.	Fed: none Calif: SH CNPS List 1B.2	Minimal (presumed extinct, local rarity)
Eriogonum kennedyi var. *austromontanum* Southern mountain buckwheat	Matting woody perennial; pebble plains and similar soils, about 5800 - 7800 ft. elev.; nearly endemic to Big Bear area, also reported at Mt. Pinos	July - August	Fed: **THR** Calif: S2.2 CNPS: List 1B.2	Apparent introgression w/ Wright's buckwheat (see text)
Eriogonum microthecum var. *lacus-ursi* Bear Lake buckwheat	Subshrub; montane forests and shrublands; only known occurrence at Big Bear Lake shore ca. 7200 ft. elev.	July - Sept	Fed: none Calif: S 1 CNPS List 1B.1	Minimal (field survey)
Eriophyllum lanatum var. *obovatum* Southern Sierra woolly sunflower	Perennial herb; open montane coniferous forests, 4200-8200 ft. elev.; S Sierra Nevada and western San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Galium jepsonii (*G. angustifolium* var. *subglabrum*) Jepson's bedstraw	Perennial herb; sandy or gravelly soils, montane conifer forest, 6500-8100 ft. elev.; San Gabriel and San Bernardino Mtns	July - August	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Galium johnstonii (*G. angustifolium* var. *pinetorum*) Johnston's bedstraw	Perennial herb, dry slopes, chaparral, lower montane forest, pinyon and juniper woodland; about 4000-7600 ft. elev.; San Bernardino, San Gabriel, maybe San Jacinto mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Low-moderate (suitable habitat occurs; margin of elev. range)
Gilia leptantha ssp. *leptantha* San Bernardino Mtn. gilia	Annual; sandy or gravelly soils, open pine forest; endemic to upper Santa Ana Riv. watershed, San Bernardino Mtns., about 5000 to 7700 ft. elev.	June - Aug	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (probably outside geogr. range)
Heuchera hirsutissima Shaggy-haired alum root *Heuchera parishii* Parish's alumroot	Perennial herbs; rocky outcrops, cliffs, slopes; montane forest or alpine boulderfields; above about 4800 ft. elev.; *H. hirsutissima* is endemic to San Jacinto and Santa Rosa Mtns (unconfirmed from San Bernardino Mtns); *H. parishii* endemic to San Bernardino Mtns	May - July	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (poorly suitable habitat)
Hulsea vestita ssp. *parryi* Parry's sunflower	Perennial herb; gen. conifer forests, on loose eroding soil and talus; San Bernardino Mtns and Little San Bern. Mtns; about 5500-9500 ft. elev.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	Low-moderate (marginal habitat)
Ivesia argyrocoma Silver-haired ivesia	Perennial herb; pebble plains, seasonal meadows, drainages; about 4900-8800 ft. elev.; San Bernardino Mtns and a long-disjunct site in Baja Calif mtns	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Occurs (field survey & NDDB record)
Juncus duranii Duran's rush	Perennial herb; meadows, seeps, etc., montane forest, about 5800-9000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	July - August	Fed: none USFS: none Calif: S 3.3 CNPS: List 4.3	Low (masrginal habitat occurs)
Lewisia brachycalyx Short-sepaled lewisia	Perennial herb; wet meadows, mesic forest openings, about 4500-7600 ft. elev.; San Bernardino Mtns to Baja Calif, Utah, New Mexico	May - June	Fed: none Calif: S3.2 CNPS: List 2.2	Low-Moderate (marginal habitat)
Lilium parryi Lemon lily	Bulb; meadows and streambanks, about 4200 - 8600 ft. elev.; mtns of S Calif. and SE Arizona	July - August	Fed: none Calif: S2.1 CNPS: List 1B.2	Low (marginal habitat)
Linanthus killipii Baldwin Lake linanthus	Annual; pebble plains, alkaline meadows, forest openings, about 5500-7900 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.1 CNPS: List 1B.2	High (suitable habitat occurs)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Mimulus exiguus San Bernardino Mountain monkeyflower	Annual; open, seasonally moist meadows, seeps, drainages, about 5900 - 7600 ft. elev.; San Bernardino Mtns. and high mtns of Baja Calif.	June - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Mimulus purpureus Purple monkeyflower	Annual; meadow edges, forests, drainages, seeps, about 6200 - 7600 ft. elev.; San Bernardino Mtns and high mtns of Baja Calif.	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Navarretia peninsularis Baja navarretia	Annual herb; open, seasonally wet places in coniferous forests, about 4900 -7600 ft. elev.; mtns of central and S Calif. and N Baja Calif.	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low (small patches of marginal habitat)
Oxytheca caryophylloides Chickweed oxytheca	Annual; sandy soils in conifer forests, 3900-8500 ft. elev.; S Sierra Nevada, Transverse Ranges, San Jacinto Mtns	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Perideridia parishii ssp. *parishii* Parish's yampah	Perennial herb; meadows, moist areas in conifer forest, about 4800 - 9900 ft. elev.; San Bernardino Mtns and (disjunct) AZ, Nevada, New Mexico	June - August	Fed: none Calif: S2.2? CNPS: List 2.2	Low - moderate (marginal habitat)
Phacelia exilis (*P. mohavensis* var. *exilis*) Transverse Range phacelia	Annual; sandy or gravelly soils, forest openings, meadows, pebble plains, about 3600 - 8900 ft. elev.; S Sierra Nevada and Transverse Ranges	May - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Phacelia mohavensis Mojave phacelia	Annual; sandy or gravelly soil; dry meadows and streambeds gen. within pine forest, about 4500-8100 ft. elev.; San Gabriel & San Bernardino Mtns.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Phlox dolichantha Bear Valley phlox	Perennial herb; montane forest and pebble plains; about 6000 - 9800 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Poa atropurpurea San Bernardino bluegrass	Open, flat meadows, about 6700 - 7500 ft. elev. in the San Bernardinos; endemic to San Bernardino Mtns and San Diego Co. (Palomar and Laguna Mtns where it ranges down to about 4400 ft. elev.)	May - June	Fed: **END** Calif: S2.2 CNPS: List 1B.2	Low (habitat marginal at best)
Potentilla glandulosa ssp. *ewanii* Ewan's cinquefoil	Perennial herb; mesic conifer forest, about 6200-7900 ft. elev.; nearly endemic to San Gabriel Mtns., but also reported from Fawnskin area, San Bernardino Mtns.	June - July	Fed: none Calif: S 1.3 CNPS List 1B.3	Low (field survey)
Pyrrocoma uniflora ssp. *gossypina* (*Haplopappus uniflorus* ssp. *gossypinus*) Bear Valley pyrrocoma	Perennial herb; meadows (usually alkaline), pebble plains, about 5200 - 7600 ft. elev.; San Bernardino Mts endemic	July - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low - moderate (marginally suitable habitat occurs)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Rupertia rigida (*Psoralea rigida*) Parish's rupertia	Perennial herb; chaparral, forests, and woodlands, about 2300-8200 ft. elev.; San Bernardino Mtns, Peninsular Ranges, Baja Calif.	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Selaginella asprella Bluish spike-moss	Herb; rocks, crevices, & rocky soils, dry sites in conifer forests, about 5200-8800 ft. elev.; scattered mtn. ranges of cent. & S Calif., Baja Calif.	July	Fed: none Calif: S3.3 CNPS: List 4.3	Low (marginal habitat)
Senecio bernardinus (*Packera bernardinoa*) San Bernardino butterweed	Perennial herb; dry meadows (incl. alkaline), about 5900-7600 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	Low (marginally suitable habitat)
Senecio ionophyllus Tehachapi ragwort	Perennial herb; crevices, rocky places in dry conifer forest, about 4800-8900 ft. elev.; S Sierra Nevada, San Gabriel and San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Moderate (suitable habitat)
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	Perennial herb; chaparral, oak shrubland or woodland, pine forest; San Bernardino Mtns. and a few Santa Barbara Co. sites, about 3200 - 6000 ft. elev.	June - August	Fed: none CA: **Rare** S 1.2 CNPS: List 1B.2	Minimal (marginal habitat, above elev. range)
Sidalcea pedata Bird's foot checkerbloom	Perennial herb; meadows (freshwater or alkaline clay), sometimes streambanks, about 5200-8200 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: **END** Calif: **END**, 1.1 CNPS: List 1B.1	Low (habitat marginal at best)
Sphenopholis obtusata Prairie wedge grass	Perennial grass; riparian woodlands, meadows, streambanks; about 1000 - 6600 ft. elev.; few scattered locns in Calif. but widespread in N America	April - July	Fed: none Calif: S2.2 CNPS: List 2.2	Low (upper margin elev. range; poor habitat)
Streptanthus bernardinus Laguna Mountains jewelflower	Perennial herb; chaparral, hardwood & conifer forest, about 3900-8100 ft. elev.; mtns of S Calif. (gen. W half of San Bernardino Mtns)	June - July	Fed: none Calif: S 3.3 CNPS: List 4.3	Moderate (margin of geogr. range)
Streptanthus campestris Southern jewelflower	Perennial herb; shrublands, forests, woodlands, often rocky sites, about 2900 -7600 ft. elev.; Transverse and Peninsular Ranges, Baja Calif.	May - July	Fed: none Calif: S 2.3 CNPS: List 1B.3	High (suitable habitat occurs)
Swertia neglecta (*Frasera neglecta*) Pine green-gentian	Perennial herb; conifer forests and pinyon woodland., about 4600-8200 ft. elev.; S Coastal Ranges and Transverse Ranges	May - July	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Taraxacum californicum California dandelion	Perennial herb; wet meadows, about 5300 - 9200 ft. elev.; San Bernardino Mtns endemic	May - Aug	Fed: **END** Calif: S2.1 CNPS: List 1B.2	Low - moderate (suitable habitat occurs)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Thelypodium stenopetalum Slender-petaled thelypodium	Perennial herb; meadows (mesic, usually alkaline clay), about 5200 - 8200 ft. elev.; endemic to Big Bear and Holcomb Valleys	May - Aug	Fed: **END** Calif: **END**, 1.1 CNPS: List 1B.1	Minimal (no alkaline meadow habitat)
Trichostema micranthum Small-flowered bluecurls	Annual; dry margins of lakes, meadows, and streams, 5000-7600 ft. elev., San Bernardino Mtns and Baja Calif.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Viola pinetorum ssp. *grisea* Grey-leaved violet	Perennial herb; montane forests, about 4900 -11,200 ft. elev.; S Sierra Nevada and reported San Bernardino Mtns (CNPS but no other source)	April - July	Fed: none Calif: S 1.3 CNPS: List 1B.3	Low (suitable habitat occurs; may be outside geogr. range)

General references: CDFG 2007a, 2007b; CNPS 2007; Hickman (ed.) 1993; Munz 1974; Sanders et al. 1995; Tibor 2001, US Fish and Wildlife Service 2006.

Conservation Status

Federal designations: (federal Endangered Species Act, US Fish and Wildlife Service). Until 1996, FWS maintained a list of "category 2 candidates," described as species of concern, but with insufficient data to support listing. This list is no longer maintained and FWS has no "SOC" category.

END: Federally listed, endangered.
THR: Federally listed, threatened.
Candidate: Sufficient data are available to support federal listing, but not yet listed.
Proposed: Formally proposed for federal status shown.

***State designations*:** (California Endangered Species Act, California Dept. of Fish and Game)

END: State listed, endangered.
THR: State listed, threatened.
RARE: State listed as rare (applied only to certain plants).
CSC: California species of special concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.
FP: Fully protected. May not be taken or possessed without permit from CDFG.

CDF&G Natural Diversity Data Base Designations: Applied to special status plants and sensitive plant communities; where correct category is uncertain, CDF&G uses two categories or question marks.

S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.
S1.1: Very threatened
S1.2: Threatened
S1.3: No current threats known
S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above).
S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimal suffixes same as above).
S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.
S5: Demonstrably secure or ineradicable in California. No threat rank.
SH: All California occurrences "historical" (i.e., no records in > 20 years).

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

California Native Plant Society (CNPS) designations. Note: According to CNPS (Tibor, ed., 2001 p. 54-55), plants on Lists 1A, 1B, and 2 meet definitions as threatened or endangered and "are eligible" for state listing. That interpretation of the state Endangered Species Act is not in general use.

List 1A: Plants presumed extinct in California.
List lB: Plants rare and endangered in California and throughout their range.
List 2: Plants rare, threatened or endangered in California but more common elsewhere in their range.
List 3: Plants about which we need more information; a review list.
List 4: Plants of limited distribution; a watch list.

CNPS Threat Rank:

.1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20-80% occurrences threatened)
.3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

Watch Lists: Several public and private conservation organizations maintain lists of wildlife species of concern. See CDFG 2007 introductory section for further explanations and references.
ABC: American Bird Conservancy Green List
Audubon: National Audubon Society Watch List
IUCN: World Conservation Union Species Survival Commission Red List

Definitions of occurrence probability: Estimated occurrence probabilities based literature sources cited earlier and field surveys and habitat analyses reported here.

Occurs: Observed on the site by qualified biologists.
Expected: Not observed or recorded on the site, but very likely present during at least a portion of the year.
High: Habitat is a type often utilized by the species and the site is within the known range of the species.
Moderate: Site is within the known range of the species and habitat on the site is a type occasionally used.
Low: Site is within the species' known range but habitat is rarely used, or the species was not found during focused surveys covering less than 100% of potential habitat or completed in marginal seasons.
Minimal: No suitable habitat on the site; or well outside the species' known elevational or geographic ranges; or a focused study covering 100% of all suitable habitat, completed during the appropriate season and during a year of appropriate rainfall, did not detect the species.
Unknown: No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

Appendix 3:
Species List

Appendix 3: Species list

Latin Name	**Common Name**		
CUPRESSACEAE	CYPRESS FAMILY		
Calocedrus decurrens	Incense cedar	Occas. / forest	
Juniperus occidentalis	Western juniper	Comm. / forest	
PINACEAE	PINE FAMILY		
Abies concolor	White fir	Occas. / forest	
Pinus jeffreyi	Jeffrey pine	Comm. / forest	
Pinus monophylla	Pinyon pine	Occas. /forest	
APIACEAE	CELERY FAMILY		
Lomatium nevadense	Nevada lomatium	Uncomm. / forest	11669
Tauschia parishii	Parish tauschia	Scarce / open places	11668
ASTERACEAE	ASTER FAMILY		
Achillia millefolium	California yarrow	Comm. / esp. mesic sites	
Agoseris retrorsa	Spear-leaved agoseris	Occas. / throughout	
Antennaria dimorpha	Low everlasting	Comm. / pebble plains	
Artemisia dracunculus	Tarragon	Occas. / esp. near road, lakeshore	
Artemisia ludoviciana	Western mugwort	Occas. / open places, washes	
Artemisia tridentata	Great Basin sagebrush	Comm. / open forest	
Aster frondosus	Short-rayed alkali aster	Occas.-comm. / near shore	
Chrysothamnus nauseosus	Common rabbitbrush	Occas. / throughout	
Chrysothamnus viscidiflorus	Curlleaf rabbitbrush	Occas.-comm. / throughout	
Cirsium occidentale var. californicum	California thistle	Uncomm. / open sites	
* *Cirsium vulgare*	Bull thistle	Occas. / near shore	
Erigeron breweri	Brewer's daisy	Occas. / forest	
Erigeron divergens	Diffuse daisy	Comm. / gen. open places	11667
Eriophyllum confertiflorum	Golden yarrow	Comm. / ± throughout	
Gnaphalium canescens	Perennial cudweed	Uncomm. / gen. open places	
* *Gnaphalium luteo-album*	Pearly everlasting	Occas. / roadside, shoreline	
Hymenopappus filifolius	Columbia cutleaf	Uncomm. / open forest	
* *Lactuca serriola*	Prickly lettuce	Occas. / mostly roadside	
Lessingia filaginifolia (Corethrogyne filaginifolia)	Chaparral aster	Occas. / open forest	
Madia elegans	Elegant tarplant	Occas. / forest	
* *Senecio vulgaris*	Common groundsel	Uncomm. / gen. roadside	
Solidago californica	Calif. goldenrod	Occas. / mesic sites	
* *Sonchus oleraceus*	Common sow thistle	Occas. / near shore	
* *Taraxacum officinale*	Common dandelion	Occas. / roadside, shoreline	
Tetradymia comosa	Hairy horsebrush	Occas. / open forest	
* *Tragopogon dubius*	Oyster plant, salsify	Occas. / roadside, forest	
BORAGINACEAE	BORAGE FAMILY		
Cryptantha micrantha	Purple root cryptantha	Occas. / open places	
Cryptantha simulans	Popcorn flower	Scarce / open places	11670
BRASSICACEAE	MUSTARD FAMILY		
Arabis holboellii (?)	Holboell's rock-cress	Occas. / open forest	
** *Arabis parishii*	Parish's rock-cress	Occas. / pebble plains	11665
Caulanthus major	Slender wild-cabbage	Occas. / forest	
Descurainia incisa (D. richardsonii)	Mountain tansy mustard	Uncomm. / near road	

Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season. Plants were identified using keys, descriptions, and illustrations in Abrams (1923-1951), Hickman (1993), Munz (1974), and other regional references. Taxonomy and nomenclature generally follow Hickman. Some plants were collected as vouchers (see collection numbers at right) and will be donated to the Herbaria at Rancho Santa Ana Botanic Garden or UC Riverside.

Appendix 3: Species list

BRASSICACEAE, cont.			
Descurainia pinnata	Tansy mustard	Occas. / mostly open forest	
Erysiumum capitatum	Douglas wallflower	Occas. / ±throughout	
* *Lepidium virginicum v. pubescens*	Wild peppergrass	Occas. / mostly roadside, shoreline	
* *Sisymbrium altissimum*	Tumble mustard	Occas. / roadside	
CACTACEAE	CACTUS FAMILY		
Opuntia basilaris var. basilaris	Common beavertail cactus	Uncomm. / open forest	
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY		
Symphoricarpos rotundifolius var. parishii	Parish snowberry	Occas. / shaded forest	
CARYOPHYLLACEAE	CARNATION FAMILY		
Silene verecunda ssp. platyota	Cuyamaca campion	Occas. / forest	
CHENOPODIACEAE	GOOSEFOOT FAMILY		
* *Chenopodium album (?)*	Common goosefoot	Occas. / throughout	
* *Salsola tragus*	Russian thistle, tumbleweed	Occas. / mostly roadside	
CONVOLVULACEAE	MORNING GLORY FAMILY		
Calystegia malacophylla ssp. fulcrata (C. fulcrata)	Morning glory	Occas. / throughout	
ERICACEAE	MANZANITA FAMILY		
Arctostaphylos patula	Greenleaf manzanita	Occas.-comm. / forest	
EUPHORBIACEAE	SPURGE FAMILY		
Chamaesyce albomarginata	Rattlesnake spurge	Occas. / open forest	
Euphorbia palmeri	Wood spurge	Occas. / uplands	
FABACEAE	PEA FAMILY		
Amorpha californica	Calif. false indigo	Occas. / mesic forest	
** *Astragalus leucolobus*	Bear Valley woollypod	Comm. / pebble plains	11705
Astragalus douglasii	Douglas rattleweed	Uncomm. / open places	
Lotus argyraeus	Silver lotus	Occas. / open forest	
Lotus nevadensis	Nevada lotus	Comm. / open places	
Lupinus cf. breweri	Silver mat lupine	Comm. / pebble plains, etc.	
Lupinus excubitus var. austromontanus	Southern mountain lupine	Occas. / ±throughout	11666
Lupinus lepidus v. confertus	Prairie lupine	Occas. / lakeshore	
* *Medicago lupulina*	Black medick	Uncomm. / near lakeshore	
* *Melilotus alba*	White sweet-clover	Occas.-comm. / roadsides, shore	
FAGACEAE	OAK FAMILY		
Quercus kelloggii	California black oak	Comm. / forest	
GERANIACEAE	GERANIUM FAMILY		
* *Erodium cicutarium*	Red-stemmed filaree	Occas.-comm. / roadsides, etc.	
HYDROPHYLLACEAE	WATERLEAF FAMILY		
Eridictyon trichocalyx	Yerba santa	Occas. / open forest	
Phacelia distans (?)	Common phacelia	Uncomm. / open forest	
Phacelia imbricata	Broad-sepaled phacelia	Uncomm. / open forest	
LAMIACEAE	MINT FAMILY		
Monardella linoides (?) (or M. odoratissima)	Flax-leaved monardella	Occas. / forest	
Scutellaria siphocampyloides (S. austinae)	Austin's skullcap	Uncomm. / mesic forest	
LOASACEAE	STICK-LEAF FAMILY		
Mentzelia sp.	Unid. stick-leaf	Uncomm. / uplands	11674
MALVACEAE	MALLOW FAMILY		
* *Malva parviflora*	Cheeseweed	Occas. / mostly lakeshore	
ONAGRACEAE	EVENING PRIMROSE FAMILY		
Clarkia sp.	Unid. annual clarkia	Uncomm. / shaded forest	

Appendix 3: Species list

ONAGRACEAE (cont.)			
Epilobium brachycarpum (E. paniculatum)	Summer cottonweed	Occas.-comm. upland margins	
Epilobium ciliatum	Willow-herb	Occas. / mostly lakeshore	
Gaypohytum sp.	Unid. gayophytum	Comm. / open forest	
POLEMONIACEAE	PHLOX FAMILY		
Gilia latiflora (?)	Broad-flowered gilia	Uncomm. / open forest	
Gilia modocensis	Modoc gilia	Occas. /open places	11,659
Eriastrum densifolium ssp. densifolium	Mojave woolly-star	Occas. / open forest	
Eriastrum sapphirinum	Sapphire woollystar	Occas. / open forest	
Linanthus breviculus	Mojave linanthus	Comm. / open forest	
Phlox gracilis	Slender phlox	Comm. / open places	11660
POLYGONACEAE	BUCKWHEAT FAMILY		
Eriogonum davidsonii (=E. molestum var. davidsonii)	Davidson buckwheat	Occas. / open forest	
** *Eriogonum kennedyi var. austromontanum*	Southern mountain buckwheat	Uncomm., pebble plain, intergrade w/ E. wrightii?	11760
Eriogonum wrightii ssp. subscaposum	Wright's buckwheat	Comm. & characteristic / pebble plains	
Eriogonum umbellatum v. munzii	Munz sulfur buckwheat	Occas. / open forest	
* *Polygonum arenastrum*	Common knotweed	Occas. / roadside, lake shore	
* *Rumex crispus*	Curly dock	Occas. / mostly lakeshore	
Rumex salicifolius	Willow dock	Uncomm. / near lakeshore	
PORTULACACEAE	PURSLANE FAMILY		
Lewisia rediviva	Bitter root	Occas.-comm. / pebble plains	
RANUNCULACEAE	BUTTERCUP FAMILY		
Delphinium parishii (?)	Parish larkspur	Occas. / forest	
* *Ranunculus sceleratus*	Cursed buttercup	Occas. / lakeshore	11656
RHAMNACEAE	BUCKTHORN FAMILY		
Ceanothus cordulatus	Mountain whitethorn	Occas. / open forest	
Ceanothus greggii	Cupleaf ceanothus	Uncomm. / open forest	
Ceanothus integerrimus	Deerbrush	Occas. / forest	
ROSACEAE	ROSE FAMILY		
Amelanchier utahensis	Service berry	Comm. / ± throughout	
Cercocarpus betuloides	Birch-leaf mountain mahogan	Uncomm.	
Cercocarpus ledifolius	Curlleaf mountain mahogany	Comm. / ± throughout	
Horkelia rydbergii (H. bolanderi s. parryi)	Transverse range horkelia	Occas. / mostly near lake	
** *Ivesia argyrocoma*	Silver-haired ivesia	locally comm. / pebble pl.	11658
Potentilla anserina	Silverweed	Comm. / lakeshore	
Potentilla biennis	Biennial cinquefoil	Comm. / lakeshore	11671
Potentilla gracilis	Slender cinquefoil	Occas. / mesic places	
Potentilla wheeleri	Wheeler cinquefoil	Scarce / near lakeshore	11673
RUBIACEAE	COFFEE FAMILY		
* *Galium aparine*	Goose grass	Uncomm. / shaded forest	
Galium parishii	Parish bedstraw	Occas. / forest	
SALICACEAE	WILLOW FAMILY		
Populus balsamifera trichocarpa	Black cottonwood	Seedlings only / lakeshore	
Salix laevigata (?)	Red willow	Uncomm. / lakeshore	
Salix lasiolepis (?)	Arroyo willow	Comm. / lakeshore	
SCROPHULARIACEAE	SNAPDRAGON FAMILY		
** *Castilleja cinera*	Ash-gray paintbrush	Localized / pebble plains	11657
** *Castilleja montigena (C. applegatei ssp. martinii)*	Heckerd's paintbrush	Occas. / forest	

Appendix 3: Species list

SCROPHULARIACEAE, cont.			
Collinsis parviflora	Small-flowered blue-eyed Mar	Comm., patchy / peb. pl.	11661
Limosella acaulis	Mudwort	Comm.-abund. / wet lakeshoı	11655
Mimulus guttatus	Seep monkeyflower	Occas. / lakeshore	
Pedicularis semibarbata	Pine-woods lousewort	Occas. / forest	11664
Penstemon eatonii	Eaton firecracker	Occas. / forest	
* *Verbascum thapsus*	Common muellin	Occas. / throughout	
SOLANACEAE	NIGHTSHADE FAMILY		
Solanum xanti	Chaparral nightshade	Uncomm. / forest	
STERCULIACEAE	CACAO FAMILY		
Fremontodendron californicum	Flannel bush	Occas.-comm. / open forest	
TAMARICACEAE	TAMARISK FAMILY		
Tamarix ramosissima	Mediterranean tamarisk	Occas. / lakeshore	
URTICACEAE	NETTLE FAMILY		
Urtica dioica ssp. holosericea	Stinging nettle	Occas. / lakeshore	
VIOLACEAE	VIOLET FAMILY		
Viola douglasii	Douglas violet	Occas. / pebble plains	11663
Viola purpurea	Mountain violet	Occas. / throughout	11662
VISCACEAE	MISTLETOE FAMILY		
Arceuthobium campylopodum	Dwarf mistletoe	Uncomm. / on yellow pines	
CYPERACEAE	SEDGE FAMILY		
Carex athrostachya	Slender-beaked sedge	Occas. / near lake	
Carex sp.	Unid. sedge	Uncomm. / near lakeshore	11671
JUNCACEAE	RUSH FAMILY		
Juncus arcticus (incl. vars. balticus and mexicanus)	Wire-grass	Occas.-comm. / mesic areas	
LILIACEAE	LILY FAMILY		
Allium parryi	Parry's onion	Occas. / mostly pebble plains	
Calochortus kennedyi	Kennedy's mariposa lily	Uncomm. / open forest	
POACEAE	GRASS FAMILY		
Agrostis sp.	Unid. bentgrass	Occas. / lakeshore	
Alopecurus aequalis	Short-awn foxtail	Comm., patchy / near shore	
Bromus carinatus	California brome	Occas. / uplands, ±throughout	
Bromus orcuttianus (?)	Orcutt brome	Uncomm. / mesic forest	
* *Bromus tectorum*	Cheat grass	Comm. / ± throughout	
Elymus elymoides (Sitanion hystrix v. hystrix)	Bottlebrush squirreltail	Occas. / ±throughout	
Elymus glaucus	Blue wild-rye	Occas. / ± throughout	
Hordeum jubatum	Foxtail barley	Uncomm. / mostly near lake	
* *Koeleria macrantha*	Junegrass	Occas. / mesic forest, uplands	
Melica stricta	Nodding melic	Uncomm. patchy, uplands	
Muhlenbergia rigens	Deergrass	Occas. / throughout	
Poa fendleriana	Fendler bluegrass	Occas.-comm. / forest	
Poa secunda	Nodding bluegrass	Comm. / ± throughout	
* *Polypogon monspeliensis*	Rabbitfoot grass	Occas.-comm. / near shore	
Pucinellia nuttalliana	Alkali grass	Uncomm. / low-lying mesic site	
Stipa coronata ssp. depauperata (Achnatherum parishii)	Parish needlegrass	Occas. / mostly open forest	
Stipa lettermannii	Letterman's needlegrass	Occas. / forest	
Vulpia microstachys (Festuca microstachys, F. reflexa, F. pacifica, F. confusa)	Annual fescue	Uncomm. patchy / upland	

Attachment 1:
California Natural Diversity Data Base Query Results

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Portrait
USGS 7½' quads: Fawnskin, Big Bear City, Big Bear Lake, Butler Pk, Keller Peak, and Moonridge

Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 ***Accipiter cooperii*** Cooper's hawk	ABNKC12040			G5	S3	SC
2 ***Antennaria marginata*** white-margined everlasting	PDAST0H1G0			G4G5	S1.3	2.3
3 ***Arabis dispar*** pinyon rock cress	PDBRA060F0			G3	S2.3	2.3
4 ***Arabis parishii*** Parish's rock cress	PDBRA061C0			G2	S2.1	1B.2
5 ***Arabis shockleyi*** Shockley's rock cress	PDBRA061V0			G3	S2.2	2.2
6 ***Arenaria lanuginosa ssp. saxosa*** rock sandwort	PDCAR040E4			G5T5	S1.3	2.3
7 ***Arenaria ursina*** Big Bear Valley sandwort	PDCAR040R0	Threatened		G2	S2.1	1B.2
8 ***Astragalus albens*** Cushenbury milk-vetch	PDFAB0F0A0	Endangered		G1	S1.1	1B.1
9 ***Astragalus lentiginosus var. sierrae*** Big Bear Valley milk-vetch	PDFAB0FB9L			G5T1	S1?	1B.2
10 ***Astragalus leucolobus*** Big Bear Valley woollypod	PDFAB0F4T0			G2	S2.2	1B.2
11 ***Astragalus tricarinatus*** triple-ribbed milk-vetch	PDFAB0F920	Endangered		G1	S1.2	1B.2
12 ***Atriplex parishii*** Parish's brittlescale	PDCHE041D0			G1G2	S1.1	1B.1
13 ***Botrychium crenulatum*** scalloped moonwort	PPOPH010L0			G3	S2.2	2.2
14 ***Calochortus palmeri var. palmeri*** Palmer's mariposa lily	PMLIL0D122			G2T2	S2.1	1B.2
15 ***Calochortus plummerae*** Plummer's mariposa lily	PMLIL0D150			G3	S3.2	1B.2
16 ***Calochortus striatus*** alkali mariposa lily	PMLIL0D190			G2	S2.2	1B.2
17 ***Castilleja cinerea*** ash-gray Indian paintbrush	PDSCR0D0H0	Threatened		G2	S2.2	1B.2
18 ***Castilleja lasiorhyncha*** San Bernardino Mountains owl's-clover	PDSCR0D410			G2	S2.2	1B.2
19 ***Chaetodipus fallax pallidus*** pallid San Diego pocket mouse	AMAFD05032			G5T3	S3	SC
20 ***Charina trivirgata*** rosy boa	ARADA02010			G4G5	S3S4	
21 ***Charina umbratica*** southern rubber boa	ARADA01011		Threatened	G5T2T3	S2S3	
22 ***Corynorhinus townsendii*** Townsend's big-eared bat	AMACC08010			G4T3T4	S2S3	SC
23 ***Dryopteris filix-mas*** male fern	PPDRY0A0B0			G5	S1.3	2.3

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24	***Dudleya abramsii ssp. affinis*** San Bernardino Mountains dudleya	PDCRA04013			G3T2	S2.2	1B.2
25	***Empidonax traillii extimus*** southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	G5T1T2	S1	
26	***Erigeron parishii*** Parish's daisy	PDAST3M310	Threatened		G2	S2.1	1B.1
27	***Eriogonum kennedyi var. austromontanum*** southern mountain buckwheat	PDPGN083B2	Threatened		G4T2	S2.2	1B.2
28	***Eriogonum microthecum var. lacus-ursi*** Bear Lake buckwheat	PDPGN083WF			G5T1	S1.1	1B.1
29	***Eriogonum ovalifolium var. vineum*** Cushenbury buckwheat	PDPGN084F8	Endangered		G5T1	S1.1	1B.1
30	***Euchloe hyantis andrewsi*** Andrew's marble butterfly	IILEPA5032			G3G4T1	S1	
31	***Gasterosteus aculeatus williamsoni*** unarmored threespine stickleback	AFCPA03011	Endangered	Endangered	G5T1	S1	
32	***Gentiana fremontii*** moss gentian	PDGEN060Y0			G4	S2.3	2.3
33	***Gila orcuttii*** arroyo chub	AFCJB13120			G2	S2	SC
34	***Gilia leptantha ssp. leptantha*** San Bernardino gilia	PDPLM040W1			G4T2	S2.3	1B.3
35	***Glaucomys sabrinus californicus*** San Bernardino flying squirrel	AMAFB09021			G5T2T3	S2S3	SC
36	***Haliaeetus leucocephalus*** bald eagle	ABNKC10010	Threatened	Endangered	G5	S2	
37	***Helianthus nuttallii ssp. parishii*** Los Angeles sunflower	PDAST4N102			G5TH	S1.1	1A
38	***Heuchera parishii*** Parish's alumroot	PDSAX0E0S0			G2	S2.3	1B.3
39	***Horkelia wilderae*** Barton Flats horkelia	PDROS0W0J0			G1	S1.1	1B.1
40	***Hydroporus simplex*** simple hydroporus diving beetle	IICOL55050			G1?	S1?	
41	***Icteria virens*** yellow-breasted chat	ABPBX24010			G5	S3	SC
42	***Ivesia argyrocoma*** silver-haired ivesia	PDROS0X020			G2	S2.2	1B.2
43	***Lampropeltis zonata (parvirubra)*** California mountain kingsnake (San Bernardino population)	ARADB19062			G4G5	S2?	SC
44	***Lesquerella kingii ssp. bernardina*** San Bernardino Mountains bladderpod	PDBRA1N0W1	Endangered		G5T1	S1.1	1B.1
45	***Lewisia brachycalyx*** short-sepaled lewisia	PDPOR04010			G4G5	S3.2	2.2
46	***Lilium parryi*** lemon lily	PMLIL1A0J0			G3	S2.1	1B.2

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
47	***Linanthus killipii*** Baldwin Lake linanthus	PDPLM090N0			G2	S2.1	1B.2
48	***Malaxis monophyllos ssp. brachypoda*** adder's-mouth	PMORC1R010			G4?T4	S1.1	2.1
49	***Mimulus exiguus*** San Bernardino Mountains monkeyflower	PDSCR1B140			G2	S2.2	1B.2
50	***Mimulus purpureus*** purple monkeyflower	PDSCR1B2B0			G2	S2.2	1B.2
51	***Myotis evotis*** long-eared myotis	AMACC01070			G5	S4?	
52	***Myotis thysanodes*** fringed myotis	AMACC01090			G4G5	S4	
53	***Myotis volans*** long-legged myotis	AMACC01110			G5	S4?	
54	***Navarretia peninsularis*** Baja navarretia	PDPLM0C0L0			G3?	S2.2	1B.2
55	***Neotamias speciosus speciosus*** Lodgepole chipmunk	AMAFB02172			G4T2T3	S2S3	
56	***Oxytheca parishii var. cienegensis*** Cienega Seca oxytheca	PDPGN0J042			G4?T1	S1.3	1B.3
57	***Oxytheca parishii var. goodmaniana*** Cushenbury oxytheca	PDPGN0J043	Endangered		G4?T1	S1.1	1B.1
58	***Pebble Plains***	CTT47000CA			G1	S1.1	
59	***Perideridia parishii ssp. parishii*** Parish's yampah	PDAPI1N0C2			G4T3T4	S2.2?	2.2
60	***Phlox dolichantha*** Big Bear Valley phlox	PDPLM0D0P0			G2	S2.2	1B.2
61	***Phrynosoma coronatum (blainvillii*** Coast (San Diego) horned lizard	ARACF12021			G4G5	S3S4	SC
62	***Piranga rubra*** summer tanager	ABPBX45030			G5	S2	SC
63	***Poa atropurpurea*** San Bernardino blue grass	PMPOA4Z0A0	Endangered		G2	S2.2	1B.2
64	***Poliomintha incana*** frosted mint	PDLAM1L020			G5	SH	1A
65	***Populus angustifolia*** narrow-leaved cottonwood	PDSAL01020			G5	S2S3	2.2
66	***Potentilla glandulosa ssp. ewanii*** Ewan's cinquefoil	PDROS1B0S3			G5T1	S1.3	1B.3
67	***Psychomastax deserticola*** desert monkey grasshopper	IIORT15010			G1G2	S1S2	
68	***Pyrrocoma uniflora var. gossypina*** Bear Valley pyrrocoma	PDASTDT0K1			G5T2	S2.2	1B.2
69	***Rana muscosa*** mountain yellow-legged frog	AAABH01140	Endangered		G2	S2	SC

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
70	***Saltugilia latimeri*** Latimer's woodland-gilia	PDPLM0H010			G2	S2.2	1B.2
71	***Senecio bernardinus*** San Bernardino ragwort	PDAST8H0E0			G2	S2.2	1B.2
72	***Sidalcea hickmanii ssp. parishii*** Parish's checkerbloom	PDMAL110A3	Candidate	Rare	G3T1	S1.2	1B.2
73	***Sidalcea pedata*** bird-foot checkerbloom	PDMAL110L0	Endangered	Endangered	G1	S1.1	1B.1
74	***Southern California Threespine Stickleback Stream***	CARE2320CA			G?	S?	
75	***Sphenopholis obtusata*** prairie wedge grass	PMPOA5T030			G5	S2.2	2.2
76	***Streptanthus campestris*** southern jewel-flower	PDBRA2G0B0			G2	S2.3	1B.3
77	***Symphyotrichum defoliatum*** San Bernardino aster	PDASTE80C0			G3	S3.2	1B.2
78	***Taraxacum californicum*** California dandelion	PDAST93050	Endangered		G2	S2.1	1B.2
79	***Thamnophis hammondii*** two-striped garter snake	ARADB36160			G3	S2	SC
80	***Thelypodium stenopetalum*** slender-petaled thelypodium	PDBRA2N0F0	Endangered	Endangered	G1	S1.1	1B.1

Attachment 2:
California Natural Diversity Data Base Forms

California Native Species Field Survey Form

Mail to:
Natural Diversity Database
California Dept. of Fish & Game
1416 Ninth Street, 12th Floor
Sacramento, CA 95814

For office use only

Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Arenaria ursina*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
		XX	Drought? Vehicle disturbance?	

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit* More ?	Fewer ?	Same ?
	XX	23			Also not seen in 2002, also a drought year	XX				xx

Collected?	no	*Coll. #,Museum/Herbarium:*
	xx	

Reporter:	Scott D. White
Address:	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* %	*fruiting* %

Animal Information

Age Structure:	*# of adults*	*# of juveniles*	*# of unknown*		
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: (*please attach map*)
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site.

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W
UTM Data *Zone* / *Datum* / *Source* / *Accuracy*		*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: (*plant communities, dominants, associates, substrates/soils, aspects/slope*)
Pebble plain surrounded by arid Jeffrey pine forest.
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	*Excellent*	*Good*	*Fair*	*Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[] *Keyed in a site reference:*	*Organism*			
[] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

California Native Species Field Survey Form

Mail to:
Natural Diversity Database
California Dept. of Fish & Game
1416 Ninth Street, 12th Floor
Sacramento, CA 95814

For office use only

Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Arabis parishii*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Uncommon on pebble plains

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
	xx	32			Not seen in 2002			*More ?*	*Fewer ?*	*Same ?*
								xx		

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11665 / RSA

Reporter:	Scott D. White
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Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* xx %	*fruiting* %

Animal Information

Age Structure:	*# of adults*	*# of juveniles*	*# of unknown*		
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: *(please attach map)*
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W
UTM Data *Zone* / *Datum* / *Source* / *Accuracy*		*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: *(plant communities, dominants, associates, substrates/soils, aspects/slope)*
Pebble plain surrounded by arid Jeffrey pine forest.
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ?? | *Excellent* | *Good* | *Fair* | *Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[x] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Ivesia argyrocoma*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Common on pebble plains

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
	xx	24			Also noted in 02	xx		*More ?*	*Fewer ?*	*Same ?*
										xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11658 / RSA

Reporter:	Scott D. White
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Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* %	*fruiting* %

Animal Information

Age Structure:		# of adults	# of juveniles	# of unknown	
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: (*please attach map*)
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W

UTM Data	*Zone*	*Datum*	*Source*	*Accuracy*	*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: (*plant communities, dominants, associates, substrates/soils, aspects/slope*)
Pebble plain surrounded by arid Jeffrey pine forest.
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	*Excellent*	*Good*	*Fair*	*Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Astragalus leucolobus*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Occasional to common on pebble plains

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
			xx		Also noted in 02	xx		*More ?*	*Fewer ?*	*Same ?*
										xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11705

Reporter:	Scott D. White
Address:	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* %	*fruiting* %

Animal Information

Age Structure:		*# of adults*	*# of juveniles*		*# of unknown*
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: (*please attach map*)
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W
UTM Data — *Zone* / *Datum* / *Source* / *Accuracy*		*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: (*plant communities, dominants, associates, substrates/soils, aspects/slope*)
Pebble plain surrounded by arid Jeffrey pine forest.
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	*Excellent*	*Good*	*Fair*	*Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[x] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Castilleja cinerea*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Occasional on pebble plain and open forest, with Eriogonum wrightii subscaposum

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
	xx	24			Also noted in 02	xx		*More ?*	*Fewer ?*	*Same ?*
										xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11657 / RSA

Reporter:	Scott D. White
Address:	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* %	*fruiting* %

Animal Information

Age Structure:	# of adults	# of juveniles	# of unknown		
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: (*please attach map*)
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W
UTM Data *Zone* / *Datum* / *Source* / *Accuracy*		*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: (*plant communities, dominants, associates, substrates/soils, aspects/slope*)
Pebble plain surrounded by arid Jeffrey pine forest.
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	*Excellent*	*Good*	*Fair*	*Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[x] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Castilleja "montigena"*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Occasional in forest

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
			xx		Also seen in 02	xx		*More ?*	*Fewer ?*	*Same ?*
										xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	No	

Reporter:	Scott D. White
Address:	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* %	*fruiting* %

Animal Information

Age Structure:		*# of adults*	*# of juveniles*	*# of unknown*	
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: (*please attach map*)
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W
UTM Data *Zone* / *Datum* / *Source* / *Accuracy*		*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: (*plant communities, dominants, associates, substrates/soils, aspects/slope*)
Arid Jeffrey pine forest; generally in relatively shaded places
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	*Excellent*	*Good*	*Fair*	*Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[] *Keyed in a site reference:*	*Organism*			
[] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

B.9 - Supplemental Focused Rare Plant Survey (Tim Krantz, June 2008

MOON CAMP TENTATIVE TRACT 16136

SUPPLEMENTAL FOCUSED RARE PLANT SURVEY

Prepared for:
Michael Brandman Associates
621 E. Carnegie Dr., Suite 100
San Bernardino, CA 92408

Prepared by:
Dr. Timothy P. Krantz
Timothy Krantz Environmental Consulting
(a division of Pangaea Nova LLC)
P.O. Box 33
Angelus Oaks, CA 92305

June 29, 2008

Project site location:	USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1 West, portion of Section 13.
Assessors Parcel Nos.:	0304-082-04 and 0304-091-12, 13 and 21
Owner /Applicant:	Tim Wood, P.O. Box 6820, Big Bear Lake, CA 92315
Principal Investigator:	Dr. Timothy P. Krantz, (909)748-8590

MOON CAMP TENTATIVE TRACT
SUPPLEMENTAL FOCUSED RARE PLANT SURVEY

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MAPS, APPENDICES, AND ATTACHMENTS

Figure 1: Regional Location Map (from EIR)

Figure 2: Project Map (from EIR)

Figure 3: Map of Pebble Plain and Ashy-gray Paintbrush Habitat

Table 1. Special Status Species Occuring On Site

Table 2. Special Status Species Determined to Not Occur On Site

MOON CAMP TENTATIVE TRACT 16136
SUPPLEMENTAL RARE PLANT SURVEY

I. EXECUTIVE SUMMARY

A focused rare plant survey of the Moon Camp Tentative Tract 16136 was completed for the property. This survey supplements a general botanical survey of the property conducted by Scott White Biological Consulting, dated August 2007 (White 2007, henceforth, "White survey"). The White survey positively identified one federally-listed plant species—ashy-gray Indian paintbrush (*Castilleja cinerea)*—and four special-status species: Parish's rock-cress (*Arabis parishii*), Big Bear Valley woollypod (*Astragalus* leucolobus), Heckard's paintbrush (*Castilleja montigena*) and silver-haired rattails (*Ivesia argyrocoma*) (Table 1).

This supplemental survey affirmed the presence of these species, and added two additional special-status species: purple monkeyflower (*Mimulus purpureus*) and Sugarloaf phlox (*Phlox dolichantha*); and disaffirmed presence of a list of other special-status and federally-listed plant species deemed to potentially occur on the property, according to White (Table 2).

The White survey had identified 13.81 acres of ashy-gray paintbrush habitat, distributed among four occurrences (Figure 1). This supplemental survey found the two easternmost occurrences to be erroneous. No ashy-gray Indian paintbrush plants occur at those two sites. In addition, the occupied habitat of the middle occurrence was found to cover less than one-third the estimated acreage reported by White, and the western occurrence exhibited a somewhat smaller occupied habitat footprint, but was deemed to generally conform to White's estimated acreage. Altogether, the occupied habitat of ashy-gray Indian paintbrush has been recalculated to approximately 7.71 acres.

II. PROJECT AND PROPERTY DESCRIPTION

The San Bernardino County Planning Department is reviewing an application for Moon Camp Tentative Tract 16136—a proposed 50-lot residential development on the former Moon Camp site in Fawnskin. The project site is on the north shore of Big Bear Lake, in the eastern part of the community of Fawnskin, in unincorporated San Bernardino County. The project site is comprised of about 62 acres, situated on both sides of State Highway 38, between Oriole Lane and Polique Canyon Road (on the Fawnskin USGS 7½' quadrangle map, in the north half of Section 13, Township 2N and Range 1W). The project site slopes from north to south. Elevation ranges from 6,960 feet in the northeastern portion of the site to 6,750 feet near the lakeshore (see Figures 1 and 2).

The project site occurs within an area that is described by the Open Space element of San Bernardino County's General Plan as, "This area includes the entire watershed area of Big Bear Lake, and contains a number of specialized habitat areas, which support a large number of endangered plants and animals (as well as commonly occurring mountain species). Habitat values

here should be maintained, potentially by controlling development to prevent damage to important habitat areas."

III. FOCUSED STUDY / SPECIES OF CONCERN

The White survey was conducted on three dates, April 30, June 7, and August 8, during the 2007 season. The 2007 precipitation season (measured from July 1 to June 30 annually) was a record drought year for the San Bernardino Mountains, with only 11.66 inches of precipitation recorded at Big Bear Dam, compared to an average annual precipitation of 36.00 inches. For this reason, White recommended that additional surveys be accomplished to determine presence or absence of four federally-listed endangered plant species known to occur in montane meadow habitats; and that a subsequent survey should be accomplished on site to determine presence or absence of three federally-listed species known to occur on pebble plain habitat. In addition, there are numerous other special-status plant species potentially occurring in the area , particularly annual species, that would not be identifiable during extreme drought years.

The 2008 precipitation year was average, with 35.29 inches through May this year, and flowering of both annual and perennial species exhibited good anthesis.

This report focuses on determining presence or absence of the following plant species:

Montane Meadow Species:

- San Bernardino bluegrass (*Poa atropurpurea*) (federally endangered);
- Bird-foot checkerbloom (*Sidalcea pedata*) (federal- and state-endangered);
- California dandelion (*Taraxacum californicum*) (federal-endangered); and
- Slender-petaled thelypodium (*Thelypodium stenopetalum*) (federal-endangered).

Pebble Plain Species:

- Bear Valley sandwort (*Arenaria ursina*) (federally threatened);
- Ash-gray Indian paintbrush (*Castilleja cinerea*) (federal-threatened); and
- Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*) (federal-threatened).

IV. METHODOLOGY

California Department of Fish and Game field survey protocols were followed for each of the target federal-listed species considered to potentially occur on site (CDFG 2000). These protocols basically require that surveys are conducted following these guidelines: (1) conducted during flowering seasons for the special status plants known from the area, (b) were floristic in nature, (c) were consistent with conservation ethics, (d) systematically covered all habitat types on the site, and (e) are well documented by this report.

A walkover of the Moon Camp property was conducted on May 5, 12 and June 6, 2008. The May 5 and 12th surveys focused on the "meadow" habitat along the lakeshore of the Big Bear Lake reservoir; and on identification of any special-status early-blooming annual plant species. The June 6 survey focused on delineation of the ashy-gray Indian paintbrush occurrences; and on identification of late-blooming annuals and perennials.

May surveys for other projects elsewhere in Big Bear Valley (North Baldwin Lake, Pan Hot Springs, Sawmill/Sugarloaf pebble plains, Eagle Point) had indicated that all seven federal-listed species considered to potentially occur on site, according to the White survey, were observed and reliably identifiable at the time of the early May surveys; and the ashy-gray paintbrush and other potential pebble plain species were readily visible, with fully-mature inflorescences, at the time of the June survey.

Positive findings (only pebble plain-associated species, including ashy-gray paintbrush) were precisely located using a Garmin GPS; and GPS data was downloaded and displayed at the Redlands Institute GIS laboratory, and transferred to the EIR consultant, Michael Brandman Associates, to their Palm Springs office; and to the project engineer, Hicks and Hartwick Engineering, in Redlands.

The meadow habitat was carefully walked throughout its narrow distribution along the lakeshore, and any other vernal springs or areas of persistent surface soil moisture were closely examined for potential endangered meadow species; and for the presence of special-status vernal annual species, such as eye-strain monkey-flower (*Mimulus exiguus*) or yellow owl's-clover (*Castilleja lasiorhyncha*).

The White survey reported four ashy-gray paintbrush occurrences, and these were the focus of the June 6 field survey—to confirm those locations and obtain an accurate GPS delineation of the ashy-gray paintbrush distribution and pebble plain habitat on the property.

V. RARE, ENDANGERED OR SENSITIVE SPECIES AND HABITATS (RESULTS)

Endangered Meadow Species

Of the four federally-listed endangered meadow species (Section 3, above), none were identified on site; and they are not considered likely to occur on site. The lakeshore habitat is not indigenous meadow habitat, such as supports the endemic meadow flora elsewhere in Big Bear Valley (Krantz 1979, 1980, 1981a, et alus); rather, it is what this author calls "ruderal" reservoir habitat. Ruderal means, "growing where the natural vegetational cover has been disturbed by man." (Webster's 9th Collegiate Dictionary) In this case, the ruderal reservoir habitat is comprised of a mix of native and non-native, aquatic and semi-aquatic plant species, existing in the zone between the high water level of the reservoir and the draw-down area. Native meadow species sometime occur along the narrow margin just above the high water level, but in the case of the Moon Camp property, this is very limited to a strand of willows (*Salix scouleriana)* and a non-diverse assemblage of common wetland species, such as wiregrass (*Juncus balticus*), yarrow (*Achillea millefolium*) and silver-leaved cinquefoil (*Potentilla anserina*).

No endangered, threatened, or special-status meadow plant species were identified on the Moon Camp property, and the potential for any occurrence of such species is considered to be extremely low.

Pebble Plain Species

The White survey had previously mapped a known pebble plain occurrence on the western portion of the property. This pebble plain contains many of the characteristic species occurring on other pebble plains in Big Bear and Holcomb Valleys, but for the Kennedy's southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*), which is replaced by the closely-related taxon, Wright's matting buckwheat (*Eriogonum wrightii* var. *subscaposum*), and absence of Bear Valley sandwort (*Arenaria ursina*). Kennedy's southern mountain buckwheat and Bear Valley sandwort were used as indicator species of pebble plains by the author, during his original systematic surveys of this endemic plant community (Krantz 1981b, 1983). The lack of both indicator species on the Moon Camp property resulted in this area not being indicated as pebble plain habitat during those initial surveys. However, the area indicated as "pebble plain" within Open Space Lot A has many other species commonly associated with true pebble plain habitat, and has been mapped as such on Figure 3.

Ashy-gray paintbrush (*Castilleja cinerea*) had been mapped as four distinct occurrences by White, but the author, in conjunction with this survey, found that the two eastern occurrences, indicated as occurring behind (north of) Lots 22, and 29-30-31 of the adjacent existing residential tract, do not support any ashy-gray paintbrush plants. There were openings of Wright's matting buckwheat at these locations, with silver rat-tails (*Ivesia argyrocoma*), which is sometimes associated with pebble plains, and Heckard's paintbrush (*Castilleja montigena*) was found on the perimeter of the openings, but no ashy-gray paintbrush exists at those locations. To verify that the author was, indeed, at the proper locations, the areas considered to be concurrent with those areas indicated by White were delineated with GPS data points to confirm the negative findings.

Similarly, the GPS delineation of the middle ashy-gray paintbrush occurrence was found to be less than one-third the size of the occupied habitat indicated in the White survey (0.11-acre actual occupied habitat, consisting of approximately 50 plants). This occurrence corresponds to the

southernmost portions of proposed Lots 47 and 48, adjoining Highway 18. In this case, it appeared that White had mapped the Wright's matting buckwheat distribution, without regard to association with the ashy-gray paintbrush.

Another very small ashy-gray paintbrush occurrence was located at the rear of Lot 49, comprised of 0.01-acre, and consisting of 10 plants.

A single point, representing three ashy-gray paintbrush plants, was located at the vernal spring on the rear portion of Lot 50; and the easternmost portion of the primary pebble plain occurrence on Lot A extends into Lot 50 on its southwestern quarter, comprising about 0.11-acre of occupied habitat.

The primary pebble plain (the westernmost occurrence according to White) was found to be more restricted than indicated by White at the eastern portion of the occurrence on Lots 49 and 50, but generally conformed to the area indicated by White in the area of the central pebble plain (within the proposed rare plant preserve) and toward the western portion of the pebble plain and ashy-gray paintbrush area. The actual occupied habitat of ashy-gray paintbrush on Lots 1 through 5 was calculated to comprise 2.07 acres.

The most exemplary pebble plain habitat on the Moon Camp property was found to conform to the area indicated by White, and would be entirely included within the proposed 4.2 acre conservation easement area. Fencing of the highway frontage has stopped the unauthorized off highway vehicle use that was evidenced on the pebble plain habitat from years past.

To summarize the results of the survey of ashy-gray paintbrush occupied habitat, it is distributed among four occurrences: Lot 47—0.11 acre, Lot 49—0.01 acre, Lot 50—0.11 acre, and the pebble plain and more extensive western occurrence, comprising 4.91 acres within Lot A, 2.07 acres within Lots 1-5, and 0.5 acre within Road A, for a total of 7.7 acres of occupied ashy-gray paintbrush.

Other Special Status Species

Two new special status species were added to the project list: purple monkeyflower (*Mimulus purpureus*) and Sugarloaf phlox (*Phlox dolichantha*). Purple monkeyflower was found to be rather widely distributed on the pebble plain and extending down into the draw to the east, corresponding to the southern half of proposed Lot 50. This draw exhibited vernal spring habitat characteristics; that is, an association of very tiny, ephemeral annuals, such as moss juncus (*Juncus bryoides*), hispid popcorn flower (*Plagiobothrys hispidulus*) and other minute monkeyflower species, such as *Mimulus androsaceus* and *M. suksdorfii*. Most of the purple monkeyflower distribution is included within the proposed 4.2 acre conservation easement area.

Sugarloaf phlox was found to be rather widely distributed on the Moon Camp property in open black oak woodland and under Jeffrey pines. Although restricted to Big Bear and Holcomb Valleys, its regional distribution extends up to the summit of Sugarloaf Mountain south of Big Bear Valley, and as far north as White Mountain, northwest of Holcomb Valley; the taxon is fairly common within its range, and is not considered to be a high priority candidate for listing or more formal protection (Krantz 1983).

Table 1: Special Status Species Occurring on the Moon Camp Property

Arabis parishii	Parish's rock-cress	Fed.: none; S2.1; List 1B.2
Astragalus leucolobus	Bear Valley woollypod	Fed.: none; S2.2; List 1B.2
Castilleja cinerea	Ashy-gray Indian paintbrush	Fed.Threatened; S2.2; List 1B.21B, 2-2-3;
Castilleja applegateii Ssp. *martinii*	Mountain paintbrush	Fed: none; S3.3; List 4.3
Ivesia argyrocoma	Fuzzy rat-tails	Fed: none; S2.2; List 1B.2
Mimulus purpureus	Purple Monkeyflower	Fed: none; S2.2; List 1B.2
Phlox dolichantha	Sugarloaf phlox	Fed: none; S2.2; List 1B.2

Fed. (Federal Rank)
State Rank (S), California Natural Diversity Database
- **S1**: Fewer than six occurrences or fewer than 1000 individuals or less than 2000 acres
- **S1.1**: Very threatened
- **S1.2**: Threatened
- **S1.3**: No current threats known
- **S2**: 6-20 occurrences or 1000-3000 individuals or 2000-10000
- **S3**: 21-100 occurrences or 3000-10000 individuals or 10000-50000 acres
- **S4**: Apparently secure in California; this rank is clearly lower than S3, but factors exist to cause some concern, *i.e.*, there is some threat or somewhat narrow habitat. No threat rank.
- **S5**: Demonstrably secure or ineradicable in California. No threat rank.

Table 2: Threatened or Endangered Species Determined Not to Occur On Site

Federal Threatened—FT
Federal Endangered—FE

Arenaria ursina	Bear Valley sandwort	FT
Eriogonum kennedyi var. *austromontanum*	Southern mountain buckwheat	FT
Poa atropurpurea	San Bernardino bluegrass	FE
Sidalcea pedata	Bird-foot checkerbloom	FE
Taraxacum californicum	California dandelion	FE
Thelypodium stenopetalum	Slender-petaled thelypodium	FE

VI. RECOMMENDATIONS

A. Establishment of a Conservation Easement and Rare Plant Habitat Preserve

A 4.91-acre rare plant preserve is proposed to be established over the pebble plain habitat. As indicated on the Tentative Tract map, this preserve will protect the most exemplary and best quality of the pebble plain habitat on site, including all seven of the special status species observed on site. A detailed management plan for the preserve area shall be adopted and recorded with the conservation easement, specifying the terms and conditions for allowed and disallowed uses within the preserve area.

The conservation easement shall be conveyed to the San Bernardino Mountains Land Trust or other land stewardship entity, together with a management endowment to cover annual costs of maintenance (replacing signs, mending fences). Interpretive literature, signs, and trails shall be developed for homeowners and visitors to provide an understanding of the sensitive resources occurring in the preserve area.

B. Building Envelopes for Paintbrush Habitat

Construction to the rear portions of Lots 47, 48, 49 and 50 shall be restricted by means of building envelopes or building setback lines, to prevent construction in the occupied ashy-gray paintbrush habitat. The rear portions of these lots abut the Highway 38 frontage, in any case, and are thus largely within the Caltrans right of way and required rear lot setbacks. Lot 50 is constrained by a drainage easement along the eastern length of the parcel, by the Caltrans right-of-way along the highway, and by pebble plain resources.

C. Offsite Compensation for Paintbrush Habitat

Off-site compensation for direct and indirect impacts to ashy-gray Indian paintbrush and pebble plain habitat outside of the 4.91-acre Conservation Easement and not protected by building setbacks (2.57 acres) may be accomplished by acquisition and protection of similar or better habitat resources elsewhere in the valley.

There is a limited amount of privately-held ashy-gray paintbrush and pebble plain habitat available for off-site mitigation. One of the best remaining examples of pebble plain habitat in private ownership that may be used to off-set impacts on the Moon Camp property is the "Sugarloaf pebble plain", situated at the northern terminus of Dixie Lee Lane in the unincorporated community of Sugarloaf. This is a 10-acre, high-quality pebble plain. It was fenced and has been protected from off-highway vehicles since the mid-1980s as a mitigation for construction of the Big Bear High School, the intention being to set aside a 2-acre portion of the 10-acre parcel as mitigation for impacts to pebble plains resources for the High School site, and use the remaining eight acres for mitigation of other projects. The parcel was surveyed by Hicks & Hartwick, but was never formally recorded.

The proposal for off-site mitigation of direct and indirect impacts to ashy-gray paintbrush and pebble plains resources on the Moon Camp property is to acquire fee title interest of the entire Sugarloaf Pebble Plain parcel (less a proposed road easement to accommodate the County's

westerly extension of Baldwin Lane); record the parcel, and convey a Conservation Easement to a responsible stewardship entity, such as the San Bernardino Mountains Land Trust (SBMLT). The conveyance of the easement shall be accompanied by a habitat management and monitoring endowment to be deposited into an escrow account for that purpose. In addition to the initial deposit to establish the habitat management account, Homeowner's Association fees shall be collected annually to provide funding in the long-term. Management guidelines, terms and conditions of the conservation easement shall be clearly defined in a Habitat Management Plan, to be recorded with the easement. These management conditions shall include maintenance of fencing and signs, maintenance of the trail across the pebble plain, and development of interpretive materials for the pebble plains resources.

D. Onsite Management

Impacts to the pebble plains habitat and sensitive plants will be minimized by the project's design, which will place the pebble plain area, including ashy-gray Indian paintbrush habitat and all six special-status species, into a permanently protected Conservation Easement. The long-term conservation value of the proposed open space requires active onsite land management to prevent "edge effects" from existing and proposed adjacent land uses.

A habitat management plan (HMP) should be developed for the Conservation Easement area. The HMP shall address management of the rare plant preserve with respect to the following indirect impacts:

- Removal and control of invasive non-native plants;
- Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation;
- Alteration of surface hydrological conditions caused by irrigation on adjacent lots, road runoff, or water diversions installed for erosion control;
- Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes; and

The HMP shall be administered by the SBMLT or other land stewardship entity. Funding for implementation of habitat management measures shall be derived from interest earned from the habitat management endowment and from annual Homeowner's Association fees.

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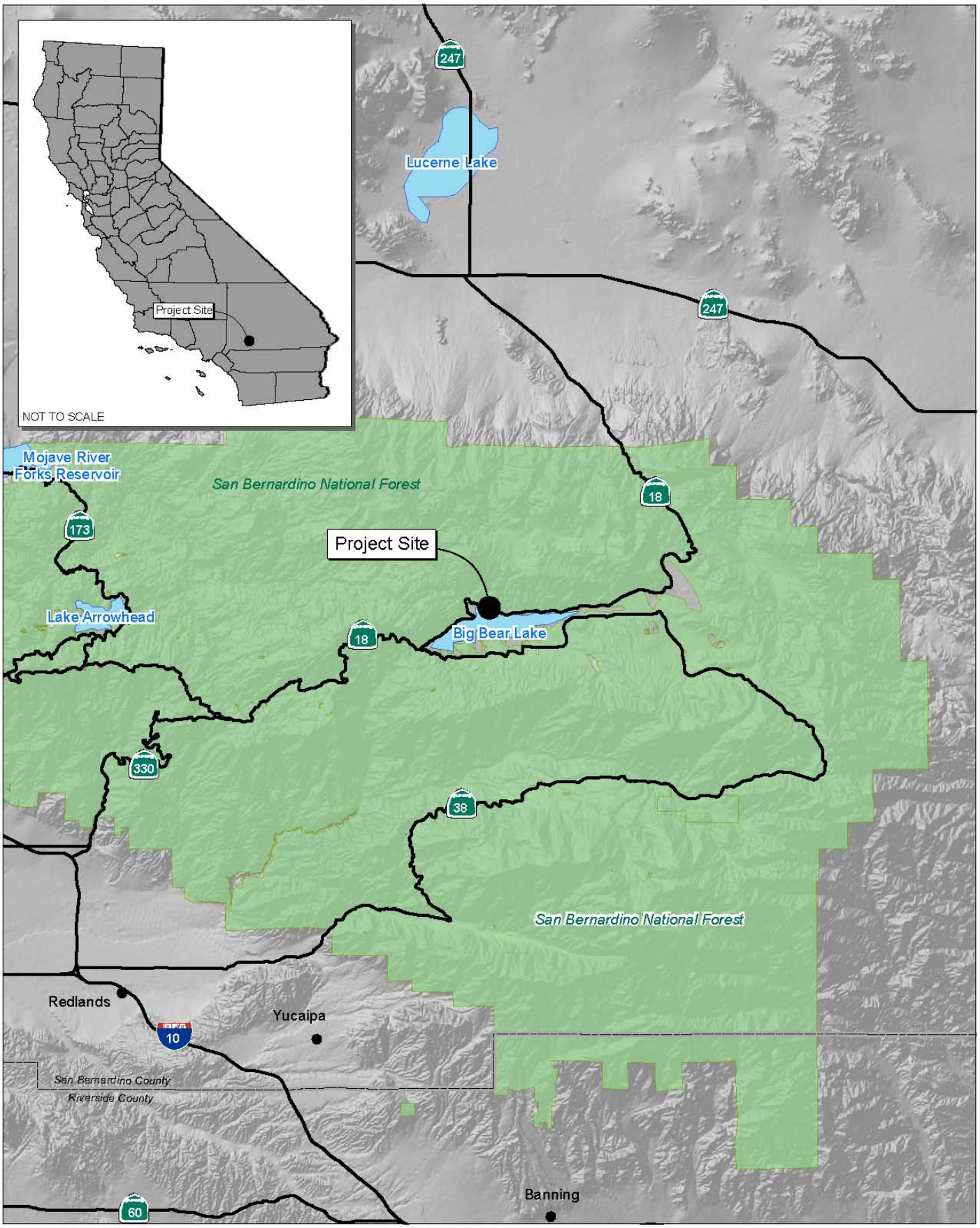
VIII. CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this supplemental rare plant survey, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me. I certify that I have not signed a nondisclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.

DATE: June 29, 2008 SIGNED: _____



Source: Census 2000 Data, The CaSIL, MBA GIS 2007.

NORTH

5 2.5 0 5 Miles

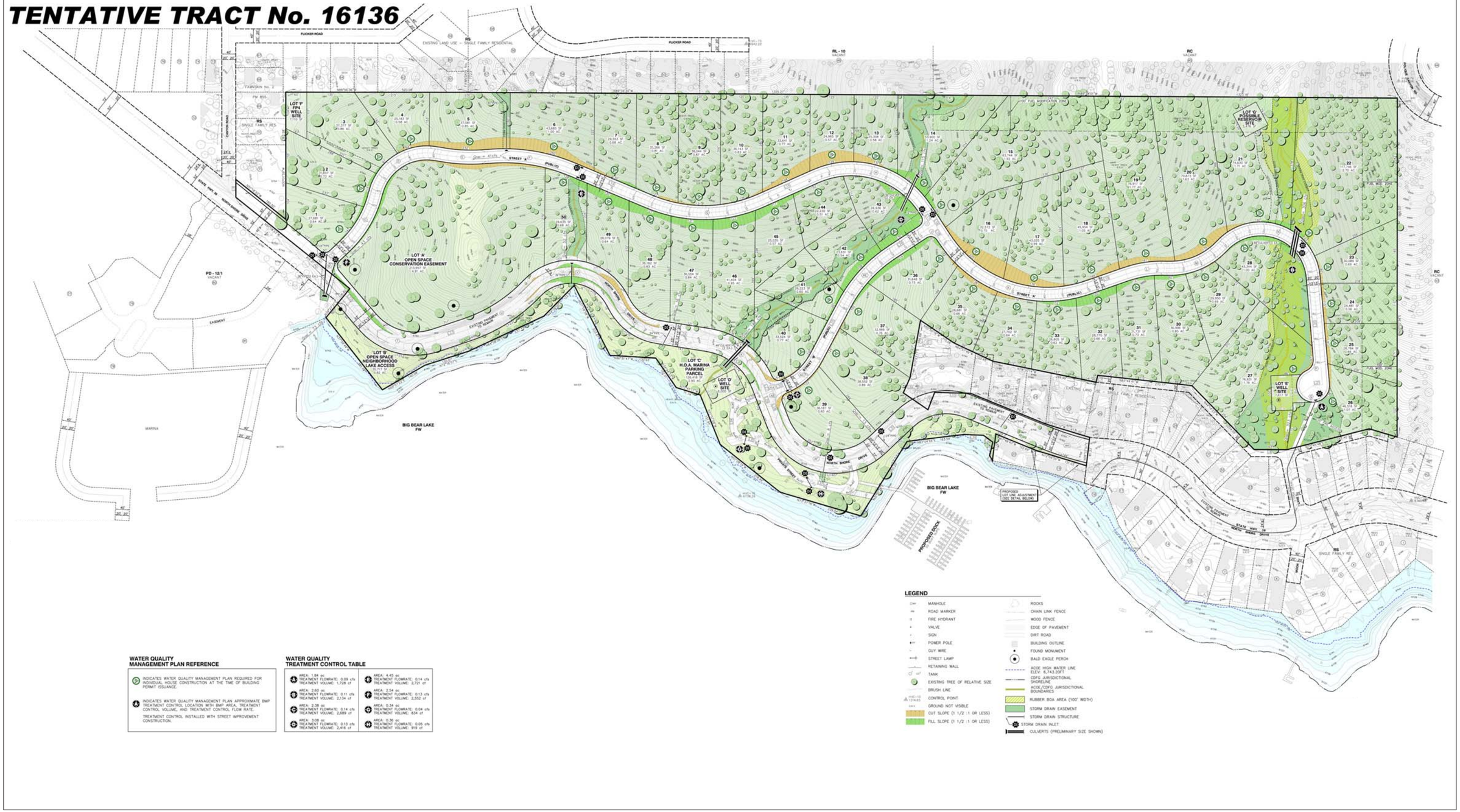
Michael Brandman Associates

Figure 1
Regional Location Map

00520089 • 07/2009 | 1_Krantz_regional.ai

MOON CAMP TENTATIVE TRACT 16136
FOCUSED RARE PLANT SURVEY

TENTATIVE TRACT No. 16136



Source: Hicks & Hartwick, Inc. (July, 2009).

NORTH

260 130 0 260 Feet

Michael Brandman Associates

00520089 • 07/2009 | 2_Krants_ttm16136.ai

Figure 2
Project Map

MOON CAMP TENTATIVE TRACT 16136
FOCUSED RARE PLANT SURVEY

Source: Hicks & Hartwick, Inc. (July, 2009) & Tim Krantz, Ph.D (July, 2009).

NORTH

260 130 0 260 Feet

Michael Brandman Associates

00520089 • 07/2009 | 3_Krants_Pebble_Plain.ai

Figure 3
Map of Pebble Plain and Ash-gray Paintbrush Habitat

MOON CAMP TENTATIVE TRACT 16136
FOCUSED RARE PLANT SURVEY

B.10 - Southern Rubber Boa Letter Report (Glen Stewart, February 2007)

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

Biological Sciences
College of Science

February 18, 2007

Mr. Michael Perry
California Collaborative Solutions
P. O. Box 706
Big Bear City, CA 92314

Dear Mr. Perry,

This letter reports my observations and evaluation of potential habitat for the Southern Rubber Boa (SRB, *Charina bottae umbratica*), a State of California Threatened Species, on two properties in the Big Bear Lake area on February 9, 2007. Accompanied by you, Lisa Kegarice, and Marni McKernan, I walked the 62 acre "Moon Camp Tract" in Fawnskin between about 11:20 AM and 12:20 PM. After lunch, you and I walked about half of the 160 acre "High Timber Ranch" tract in the Moonridge area, also driving to briefly view two other parts of the tract, between approximately 1:45 PM and 3:15 PM. Lisa and Marni accompanied us for a few minutes at the beginning of our walk there.

The Moon Camp Tract in Fawnskin is immediately adjacent to the north shore of Big Bear Lake and has a south-facing exposure at an elevation of about 6,800 feet. Roughly the western third of the tract is bounded by developed property while the eastern two thirds is bounded by Forest Service land on the north and, I believe, undeveloped private property on the east. The tract is quite dry, sloping unevenly upward to the north and east with a couple of shallow, dry ravines in the eastern portion. In the western portion, the vegetation is composed of an open stand of Jeffrey Pine, with a sparse understory of Great Basin Sagebrush and herbaceous plants. Here, there also is an open "pebble plain" habitat. The stands of pine become somewhat more dense in the eastern part of the tract with larger sagebrush shrubs. Throughout the tract, litter and duff are very thin, but there are a few moderately weathered, medium-sized logs scattered around. Significantly, there are no rock outcrops, which generally are used by SRBs for hibernation sites.

My assessment of the Moon Camp Tract is that it is poor SRB habitat. Further, it is outside of the area mapped as potential SRB habitat in the 1985 Forest Service habitat management guide for the SRB, and there have been no sightings of SRBs reported in the area. My recommendations for mitigating development of the tract are that trees and downed logs be allowed to remain in place, to the extent that clearing is not required by the development process, and that a 50 foot setback be maintained along the deepest ravine at the eastern edge of the property. These measures will serve to protect a limited amount of habitat for native wildlife, such as lizards, snakes, salamanders, chipmunks, mice and wood rats, as well as incidental SRBs.

The High Timber Ranch tract is located on Moonridge, immediately west of Sawmill Canyon and Sugarloaf, with developed property existing along the southwestern boundary. It has a north-facing exposure with several shallow ravines draining to the north-northwest and alternating with gently sloping ridges oriented in the same direction. The crowns of the ridges

are rather flat with small "pebble plain" habitats. Elevation at the upper levels of the property is about 7,200 feet. The vegetation is dominated by fairly open stands of Jeffrey Pine, mixed with small Black Oaks in much of the area. A shrubby understory is present in places, but with little sagebrush. Toward the eastern portion of the property there are occasional Pinyon Pines. Leaf litter and duff are moderately thick where there are Black Oaks, and well weathered medium-sized to large logs are common throughout the site. Significantly, again, no rock outcrops were observed.

My assessment of the High timber Ranch tract is that it is marginally suitable as SRB habitat. The northern exposure, denser vegetation, thicker layers of litter and duff, and greater abundance of large logs provide potential cover for SRBs and other forest floor wildlife. However, the site is outside of the area of potential habitat mapped in the 1985 SRB habitat guide, and no SRBs have been reported in the area. Still, I recommend that the portion of the site that I was not able to survey on foot be surveyed for rock outcrops by an experience field biologist, specifically Lisa Kegarice. Mitigations for development should be similar to those recommended for the Fawnskin site, with 50 foot setbacks along the ravines. If any rock outcrops 10 feet or greater in diameter are discovered in future surveys, they also should be protected by 50 foot setbacks.

I hope that the information and assessments I have provided above are sufficient for your purposes. Please find my invoice enclosed. If you have any questions or concerns, however, please do not hesitate to contact me by e-mail (grstewart@csupomon.edu) or phone (909-869-4093).

Sincerely yours,

Glenn R. Stewart, Ph.D.
Professor Emeritus of Zoology
and Environmental Science

TOM DODSON & ASSOCIATES
2150 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92405
TEL (909) 882-3612 • FAX (909) 882-7015
E-MAIL tda@tdaenv.com

May 1, 2007

Michael Perry
California Collaborative Solutions
P.O. Box 706
Big Bear City, CA 92314

RE: High Timber Ranch Survey

Dear Mr. Perry,

On February 9, 2007 I accompanied you and Dr. Glenn Stewart on a walking survey of the High Timber Ranch Property in the upper Moonridge area of Big Bear Lake. Dr. Stewart was able to survey approximately one half of the High Timber Ranch site that day and provided a February 18, 2007 letter report (attached) detailing his findings.

In his February 18, 2007 letter report, Dr. Stewart recommended that I survey the remainder of the High Timber site on foot to verify the absence of any rock outcrops.

On March 9, 2007, I surveyed the remainder of the site on foot with you and verified that there are no rock crops within the area of the site that Dr. Stewart did not survey on February 9, 2007.

If you need any additional information, please do not hesitate to contact me.

Sincerely,

Lisa Kegarice
Ecologist / Regulatory Specialist

Csp07/0501LK1 (CCS-193)

Appendix C:
Hydrology Study/Water Quality Management Plan

C.1 - Post Construction Water Findings (AEI CASC, October 2007)

AEI CASC CONSULTING

October 5, 2007

Nancy Ferguson
Michael Brandman Associates
220 Commerce, Suite 200
Irvine, CA 92602

Subject: Tentative Tract 16136, Moon Camp – Post Construction Water Quality Findings

Dear Ms. Fergueson,

We have reviewed the proposed Tentative Tract 16136 Moon Camp Project for Post Construction Best Management Practices (BMPs) which will address Pollutants of Concern for this project while being in compliance with the standards set forth in the document, "San Bernardino County Stormwater Program - Model Water Quality Management Plan Guidance". The purpose of this letter is to provide the results of that review.

PROJECT DESCRIPTION

The Moon Camp Project is a 62.4 acre site proposing 50 subdivided lots for individual home sale. The project also proposes a portion of the project's total acreage, approximately 8.6 acres, for dedication as open space. This project is located on the North Shore of Big Bear Lake, in the City of Big Bear, nestled in the San Bernardino Mountains.

HYDROLOGIC CONDITIONS OF CONCERN

Post-project runoff flows are proposed to generally remain in the existing natural drainage pattern, with culvert crossings occurring at low points along the highway and under interior roads, with ultimate discharge into Big Bear Lake. The Moon Camp Project development will have a minor impact on the overall existing hydrology, effecting primarily minor redirection of natural flows, with the outfall into the lake remaining largely unchanged in both location and quantity.1 Project runoff flows will be carried to the lake via six proposed storm culverts which drain directly into the lake itself; thus, runoff from the project becomes a small part of the vast storage volume in Big Bear Lake.

The Moon Camp Project is proposing minor grading and minimal increases of impervious surfaces on each lot by utilizing stemwall construction and a reduced overall construction footprint. Each lot will further reduce project runoff with the implementation of bioretention BMPs, while roads constructed as part of the project will have runoff directed to bioretention areas. Big Bear Lake has a storage capacity of approximately 73,000 Ac-ft. The project site is estimated to produce runoff equivalent to 0.04 percent of lake volume before development and 0.09 percent of lake volume after development. Thus, project runoff is a miniscule fraction of lake storage.

[1] Tract 16136 - Moon Camp Hydrology & Hydraulic Preliminary Report, July 2007, Hicks & Hartwick, Inc.

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Big Bear Lake possesses a controlled release point for project runoff flows at Big Bear Dam, which is controlled by Big Bear Municipal Water District (BBMWD). The primary goal of the BBMWD is maintaining the water level of Big Bear Lake as level as possible given the availability of water and finances. The belief is that a constant water level increases recreational use, stabilizes property value, improves water quality and supports a healthier fish and wildlife environment. BBMWD accomplishes their goal by implementing a water management plan that includes the following: [2]

- Stabilization of Big Bear Lake by managing the amount of water released to the downstream water rights holder
- Watershed/water quality management
- Recreation management
- Bear Valley Dam and Reservoir Maintenance

In many seasons, BBMWD will elect to keep water in the lake and then purchase "in-lieu" water to meet demands of the downstream water rights holder. This "in-lieu" water is purchased from the San Bernardino Valley Municipal Water District and consists of water supplied via the State Water Project.

Releases from Big Bear Dam encounter another controlled release point further downstream at the Seven Oaks Dam, which is controlled by the United States Army Corps of Engineers (USACE). The USACE operates Seven Oaks Dam in tandem with the Prado Dam, located 40.3 miles downstream on the Santa Ana River, by implementing the following strategies: [3]

- Runoff during the early flood season is stored behind Seven Oaks Dam to build a debris pool to protect outlet works;
- Small releases from Seven Oaks Dam are made on continual basis to maintain downstream water supply;
- During a flood, Seven Oaks Dam will store runoff for as long as the reservoir pool at Prado Dam is rising;
- After the flood threat has passed, Seven Oaks Dam will release stored water at a rate which does not exceed the downstream channel capacity; and
- After the flood season, Seven Oaks Dam will be gradually drained and the Santa Ana River will flow through unhindered.

BBMWD and the USACE's regulation of their structures is a function of irrigation demand, availability of water from other sources, and flood control purposes. Because these two organizations and their structures regulate and control discharges to downstream waters, and because runoff from the project is miniscule compared to the volume stored in Big Bear Lake, Hydrologic Conditions of Concern (HCOC) for the Moon Camp Project development are independently minimal and not expected to directly and significantly impact down stream receiving waters.

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[2] http://www.bbmwd.org/, Accessed Oct 1, 2007
[3] http://www.spl.usace.army.mil/resreg/htdocs/7oaks.html, Accessed Oct 1,2007

PROJECT RECEIVING WATERS

Big Bear Lake is the primary downstream receiving water for the Moon Camp project. As project runoff flows continue westerly, further downstream receiving waters are the Santa Ana River, Reaches 6 through 1, which ultimately drain to the Pacific Ocean. As Table 1 indicates, one or more of these receiving waters are impaired.

Table 1 – Project Receiving Waters and Impairments

Storm Drains and Receiving Waters	Receiving Water Classification		Primary Hydro Unit Basin No.	303(d) Listing		TMDL Pollutants
	Proximate	Downstream		Listed?	Pollutant Causing Impairment	
Big Bear Lake	Yes	Yes	801.71	Yes	Copper, Mercury & Metals – Source: **Resource Extraction** Noxious Aquatic Plants, Nutrients & Sedimentation/siltation – Source: **Construction/Land Developement** PCBs (Polychlorinated biphenyls) – Source: **Unknown**	Adopted Phosphorus
Santa Ana River (Reach 6)	No	Yes	801.72	No	None	None
Santa Ana River (Reach 5)	No	Yes	801.52	No	None	None
Santa Ana River (Reach 4)	No	Yes	801.25	Yes	Pathogens – Non Point Source	Not Adopted
Santa Ana River (Reach 3)	No	Yes	801.21	Yes	Pathogens – "Dairies"	Not Adopted
Prado Basin Management Zone	No	Yes	802.21	No	None	None
Santa Ana River (Reach 2)	No	Yes	801.11	No	None	None
Santa Ana River (Reach 1)	No	Yes	801.11	No	None	None
Pacific Ocean	No	Yes	801.11	No	None	None

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PROJECT POLLUTANTS AND POLLUTANTS OF CONCERN

Table 2 lists the pollutants likely to be associated with the development of the Moon Camp Project and compares these pollutants to pollutants causing stress in local receiving waters. When a project pollutant is the same as a pollutant causing stress in the receiving waters, the San Bernardino County Model Water Quality Management Plan Guidance requires that project runoff be treated for said pollutants utilizing BMPs that are medium to high effectiveness. Pollutants of concern for the Moon Camp project are bacteria/virus, heavy metals, nutrients, and sediments, see Table 2.

Nutrients are of particular concern because a TMDL for phosphorus has been adopted for Big Bear Lake. The current TMDL assigned to Big Bear Lake is 475 lbs per year for Urban Waste Load Allocation for phosphorus. For urban areas, compliance with this TMDL requires compliance with the Municipal separate storm sewer system (MS4) Permit which, in turn, requires implementation of Best Management Practices (BMPs) which treat pollutants of concern at a medium to high level of effectiveness.

Table 2 – List of Project Pollutants [5]

Land Use	Associated Project Pollutants		Is Pollutant 303(d) Listed and / or TMDL for Receiving Water[4]
	Pollutants	Status	
Home Subdivisions of 10 units or more & Streets/Highways/Freeways	Bacteria/Virus	Expected	Yes
	Heavy Metals	Expected	Yes
	Nutrients	Expected	Yes
	Pesticides	Expected	No
	Organic Compounds	Expected	No
	Sediments	Expected	Yes
	Trash and Debris	Expected	No
	O_2 Demanding Substances	Expected	No
	Oil and Grease	Expected	No

PERMIT REGULATIONS

WQMP Requirements

The Santa Ana Regional Water Quality Control Board Order Number R8-2002-0012, NPDES Permit No. CAS618036 (Permit) requires post-construction BMPs to be implemented for new development and significant redevelopment projects, for both private and public agencies. A Water Quality Management Plan (WQMP) is then used to guide the development and implementation of a program to minimize the detrimental effects of urbanization on the beneficial uses of receiving waters, including effects caused by increased pollutants loads and changes in hydrology. [5] Under the permit's requirements, Moon Camp will be required to comply with the WQMP guidance document by implementing the following:

- Incorporate and implement site design BMPs
- Incorporate and implement all applicable source control BMPs

[4] California Regional Water Quality Control Board, 2006 CWA Section Proposed 303(d) List of Water Quality Limited Segments, approved by the USEPA October 25, 2006.

[5] San Bernardino Stormwater Program – Model Water Quality Management Plan Guidance Document, June 2005

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- Incorporate or implement Treatment Control BMPs
- Utilize a combination of site design, source control and/or treatment control that addresses all identified pollutants and hydrologic conditions of concern.

TMDL Requirements

The Santa Ana Regional Water Quality Control Board Resolution No. R8-2006-0023, amending the Water Quality Control Plan for the Santa Ana River Basin to Incorporate a Nutrient Total Maximum Daily Load (TMDL) for Dry Hydrological Conditions for Big Bear Lake, was approved by the Office of Administrative Law (OAL) on August 21, 2007. Under this resolution, it appears that the only TMDL implementation provision applicable to the Moon Camp project is the item referring to the MS4 Stormwater Permit:

> **Implementation Task 3.1** – "Waste Discharge Requirements for the San Bernardino County Flood Control and Transportation District, the County of San Bernardino and the Incorporated Cities of San Bernardino County within the Santa Ana Region, Areawide Urban Runoff, NPDES No. CAS 618036 (Regional Board Order No. R8-2002- 0012). The current Order has provisions to address TMDL issues. In light of these provisions, revision of the Order may not be necessary to address TMDL requirements."

The deadline for the Regional Board's update to the MS4 permit is February 29, 2008; however, as noted in Implementation Task 3.1, changes to the MS4 permit may not be necessary to address TMDL issues.

The County of San Bernardino, in compliance with its MS4 permit, has adopted a program that requires new development projects, such as the Moon Camp project, to prepare and implement a Water Quality Management Plan (WQMP) that includes a combination of site design, source control, and treatment control BMPs to reduce the discharge of pollutants and hydrologic conditions of concern resulting from the development. This letter report outlines the site design BMPs, source control BMPs, and treatment control BMPs to be implemented by the Moon Camp project, with said controls to ultimately be documented in a project-specific WQMP. Therefore, by preparing and implementing a WQMP including the prescribed BMPs, the Moon Camp project will be compliant with the County's requirements, and by extension, the MS4 permit and TMDL implementation plan.

PROJECT BMPs

In order to address the project POCs and to reduce the chance of pollutants entering Big Bear Lake, the project will implement a treatment BMP that is effective for all POCs and also prepare a Water Quality Management Plan (WQMP) which shall incorporate the following:

Site Design

Lots in the Moon Camp Project are proposed to be low density with stem wall construction, thereby reducing the area of construction. This criteria in planning reduces the overall footprint of construction and minimizes the imperviousness of each lot.

Source Control

Activity restrictions and property owners' education are crucial to the project's success at preserving water quality. The more informed each property owner is the more likely they are to participate in compliance with imposed water quality standards. Conditions, covenants & restrictions (CC&R) shall be utilized in this project to clearly spell out activities that are not beneficial to water quality and shall not be

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allowed on the project site. The CC&Rs will be implemented and maintained by the project's Property Owner's Association (POA).

Treatment Control

Assuming a generous average house footprint of 3,500 sf on a 43,560 sf lot, with an estimated driveway surface of 3,000 sf, produces and impervious percentage of 15. Using this average 15% yields a water quality volume (V_0) of 1.56 Ac-ft for all project lots. Calculating the water quality volume of street runoff at 90% yields a V_0 of 0.37 Ac-ft. Therefore the individual lot treatment BMPs shall be designed to address 1.56 Ac-ft of total water quality volume, approximately 0.03 Ac-ft per lot, while the street treatment BMPS shall address the remaining 0.37 Ac-ft of the water quality volume.

Table 3 –BMPs Level of Treatment [6]

Pollutant of Concern	Treatment Control BMP Categories	
	Biofilter	Filtration
Sediment/Turbidity	H/M	H/M
Nutrients	L	L/M
Organic Compounds	U	H/M
Trash & Debris	L	H/M
Oxygen Demanding Substances	L	H/M
Bacteria & Viruses	U	H/M
Oils & Grease	H/M	H/M
Pesticides (non-soil bound)	U	U
Metals	H/M	H

Bioretention is the selected treatment BMP for the Moon Camp Project and operates similar to that of a biofilter and filtration. The individual lots will each treat their water quality volume prior to discharging from the site, with maintenance provided from the site, with maintenance provided by individual owners. The street runoff will also be treated with bioretention that is located in common areas or on open space lots, with maintenance by the POA.

As shown on Table 3, the combination of a biofilter and filtration will treat the project pollutants of concern at medium to high level of effectiveness. The Caltrans Treatment BMP Technology Report (April 2007) provides results of their full-scale pilot studies performed on various BMPs. The report shows that bioretention will effectively treat nutrients from the project, including nitrogen and phosphorus, at a medium level of effectiveness, see attached fact sheet.

[6] San Bernardino Stormwater Program – Model Water Quality Management Plan Guidance Document, June 2005

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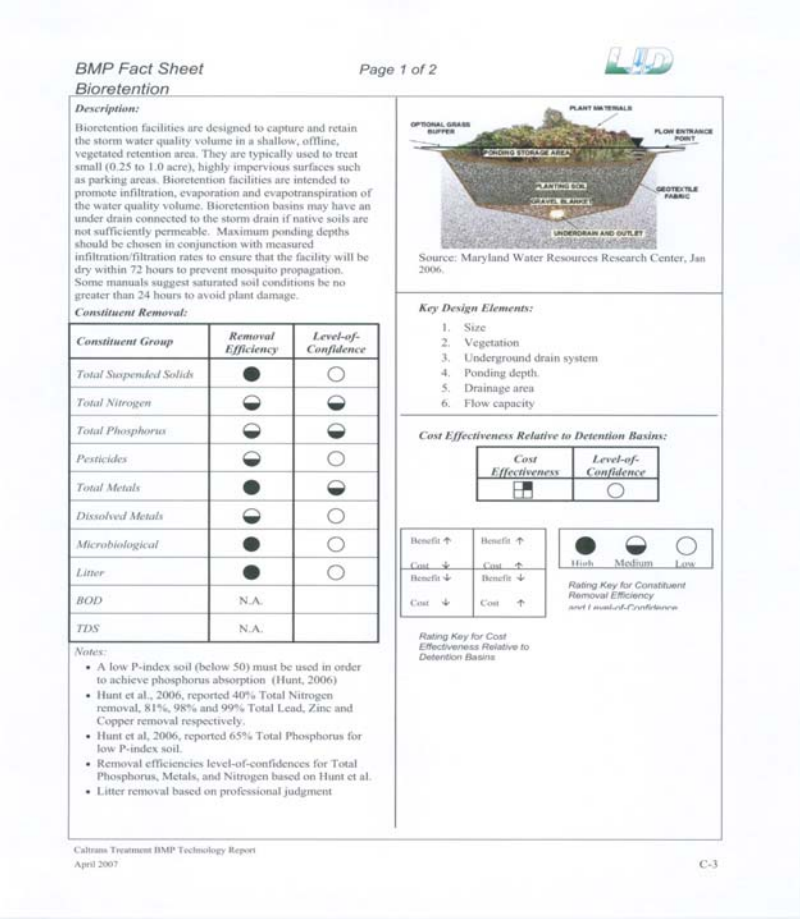

BMP Fact Sheet
Bioretention

Page 1 of 2

LID

Description:

Bioretention facilities are designed to capture and retain the storm water quality volume in a shallow, offline, vegetated retention area. They are typically used to treat small (0.25 to 1.0 acre), highly impervious surfaces such as parking areas. Bioretention facilities are intended to promote infiltration, evaporation and evapotranspiration of the water quality volume. Bioretention basins may have an under drain connected to the storm drain if native soils are not sufficiently permeable. Maximum ponding depths should be chosen in conjunction with measured infiltration/filtration rates to ensure that the facility will be dry within 72 hours to prevent mosquito propagation. Some manuals suggest saturated soil conditions be no greater than 24 hours to avoid plant damage.

Constituent Removal:

Constituent Group	Removal Efficiency	Level-of-Confidence
Total Suspended Solids	●	○
Total Nitrogen	◒	◒
Total Phosphorus	◒	◒
Pesticides	◒	○
Total Metals	●	◒
Dissolved Metals	◒	○
Microbiological	●	○
Litter	●	○
BOD	N.A.	
TDS	N.A.	

Notes:
- A low P-index soil (below 50) must be used in order to achieve phosphorus absorption (Hunt, 2006)
- Hunt et al., 2006, reported 40% Total Nitrogen removal, 81%, 98% and 99% Total Lead, Zinc and Copper removal respectively.
- Hunt et al, 2006, reported 65% Total Phosphorus for low P-index soil.
- Removal efficiencies level-of-confidences for Total Phosphorus, Metals, and Nitrogen based on Hunt et al.
- Litter removal based on professional judgment

Source: Maryland Water Resources Research Center, Jan 2006.

Key Design Elements:

1. Size
2. Vegetation
3. Underground drain system
4. Ponding depth.
5. Drainage area
6. Flow capacity

Cost Effectiveness Relative to Detention Basins:

Cost Effectiveness	Level-of-Confidence
◪	○

Benefit ↑ Cost ↓	Benefit ↑ Cost ↑
Benefit ↓ Cost ↓	Benefit ↓ Cost ↑

Rating Key for Cost Effectiveness Relative to Detention Basins

● High ◒ Medium ○ Low

Rating Key for Constituent Removal Efficiency and Level-of-Confidence

Caltrans Treatment BMP Technology Report
April 2007

C-3

The key factor in bioretention success is utilizing soils that have an initial low phosphorus index (P-Index) rating existing in the soil. The P-Index of the soil is the measurement of how much phosphorus already exists in the soil media. The lower the P-Index, the greater the amount of phosphorus the media can capture. The success of this BMP to properly address phosphorous is based on the appropriate fill media being used.

RECOMMENDATION

Therefore, it is our recommendation that the Moon Camp Project development include site design, source control and appropriate treatment control BMPs, such as bioretention, that meet the requirements of the MS4 Permit, TMDL requirements and the requirements of the San Bernardino County Water Quality Management Plan Guidance. The bioretention areas must be situated to capture runoff from the project and must be constructed utilizing an engineered planting and filtering media with a low P-Index.

Best regards,

AEI-CASC Consulting

Melanie E. Sotelo
Design Engineer

Jeffrey D. Endicott, P.E., DEE
Engineering Director
R.C.E. 40658
Expiration 3-31-2009

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C.2 - Drainage Study Review for "Hydrology and Hydraulics Preliminary Report" in Conjunction with Development of Tentative Tract 16136 (AEI CASC, May 2007)

AEI CASC ENGINEERING

May 7, 2007

Ms. Nancy M. Ferguson
Regional Manager
Michael Brandman Associates
340 S. Farrell Drive, A210
Palm Springs, CA 92262

Re: Drainage Study Review for "Hydrology and Hydraulics Preliminary Report" in conjunction with the development of Tract 16136 in the County of San Bernardino

Dear Ms. Ferguson:

INTRODUCTION:

Michael Brandman Associates (MBA) in conjunction with the County of San Bernardino requested AEI-CASC Consulting Inc. to provide technical services in order to assist the County in the review of the study "Hydrology and Hydraulics Preliminary Report" for Tract 16136. The study was prepared by Hicks& Hartwick, Inc. and was prepared October 2006.

DRAINAGE REVIEW AND EVALUATION COMMENTS

consists

In general the report performed an existing and proposed hydrology analysis based on the San Bernardino County Flood Control Hydrology Manual. The rational method hydrology was performed for the 100-yr and 10-yr storm events for a drainage area of approximately 181-acres. The drainage area~~consistence~~ of several natural streams that cross the State Highway 18 at various locations along the project limits. The drainage area and project are tributary to Big Bear Lake. The hydrology calculations performed are complete and in accordance with the San Bernardino County Flood Control Hydrology Manual.

Upon completing the review of the Study, we offer the following comments and recommendations:

- The Study included section in the report for "Surface Hydraulics" and "Storm Hydraulics", but calculations were not included. Calculations for these sections should be provided or the sections removed from the report.
- The Proposed hydrology map showed the proposed lot lines and street alignments, but elevations and proposed grading was not shown. To verify the proposed boundaries and conveyance of storm flows a copy of the TTM should be included in the report. Additionally, to assist in the verification of the proposed routing and drainage boundaries, the proposed TTM grading should be added to the proposed hydrology map and the scale increased to show the requested detail.

- Tract 16136 drains to Big Bear Lake, an impaired water body based on the San Bernardino County WQMP manual. The report should include a description of the proposed water quality treatment methods, calculation of treatment volumes and flows, and locations where treatment facilities are proposed. If a Preliminary WQMP report was prepared for Tract 16136 a copy of the report could be included as an appendices to the report.
- It appears that the proposed development will increase the nuisance flows ("Urban Slobber") to two or three of the existing downstream residences. Please describe how this will be mitigated and or minimized with the development.
- The proposed condition hydrology calculations show the developed flows increase the peak flow rate downstream of the project and into Big Bear Lake. Per the San Bernardino County Flood Control District Hydrology manual and guidelines, the increased flow rates should be decreased via detention basins to 90% of the existing condition flow rates or demonstrate that the increase in flow will not impact any downstream facilities. Based on the calculations provided the project does not meet this condition. The exemption of this condition should be discussed and approved by San Bernardino County Flood Control District.
- The proposed condition hydrology map shows that drainage areas "A" and "F" will be conveyed via roadway culverts and natural stream sections through project site. Due to the high flow rates and steep terrain it is recommended that a storm drain system be extended to intercept these drainage flows. The flows should include debris and bulking factor in the analysis. San Bernardino County Flood Control typically requires a bulking factor of 2.0 when a debris analysis is not performed.
- It is recommended that a flood plain analysis and review be performed for Drainage "A". The drainage flows for this stream are shown as 323.0 cfs for the 100-yr storm event (646 cfs for bulked flow condition). Additionally, a debris basin should be considered prior to discharge of flows into an underground storm drain. This recommendation could also be applied to drainage area "F".
- The proposed condition map shows that a storm drain will be extended from the project site (drainage area "A") to Big Bear Lake. The proposed alignment appears to require the acquisition of a drainage easement and/or right-of-way. Please demonstrate the size of required storm drain and that the proposed facility could be constructed through this area. Also, coordination with the affected property owner to provide the above mentioned rights should be demonstrated to the County of San Bernardino. This issue should be discussed in detail since it appears that the development will impact these existing residents.

If there are any questions or clarifications needed please feel free to call me at 951-342-7990 ext. 105

Sincerely,
AEI-CASC CONSULTING, INC.

Aric M. Torreyson, P.E.
Project Manager
AMT/bc

C.3 - Drainage Study Review for "Hydrology and Hydraulics Preliminary Report" in Conjunction with Development of Tentative Tract 16136 (AEI CASC, October 2007)

AEI CASC ENGINEERING

October 12, 2007

Ms. Nancy M. Ferguson
Regional Manager
Michael Brandman Associates
340 S. Farrell Drive, A210
Palm Springs, CA 92262

Re: Drainage Study Review for "Hydrology and Hydraulics Preliminary Report" in conjunction with the development of Tract 16136 in the County of San Bernardino

Dear Ms. Ferguson:

INTRODUCTION:

Michael Brandman Associates (MBA) in conjunction with the County of San Bernardino requested AEI-CASC Consulting Inc. to provide technical services in order to assist the County in the review of the study "Hydrology and Hydraulics Preliminary Report" for Tract 16136. The study was prepared by Hicks& Hartwick, Inc. and was revised July 2007.

DRAINAGE REVIEW AND EVALUATION COMMENTS

In general the report performed an existing and proposed hydrology analysis based on the San Bernardino County Flood Control Hydrology Manual. The rational method hydrology was performed for the 100-yr and 10-yr storm events for a drainage area of approximately 181-acres. The drainage area consists of several natural streams that cross the State Highway 18 at various locations along the project limits. The drainage area and project are tributary to Big Bear Lake. The hydrology calculations performed are complete and in accordance with the San Bernardino County Flood Control Hydrology Manual. Based upon the last review by AEI-CASC Consulting, the drainage report has been partially revised. Please note that no response letter addressing the comments and recommendations by AEI-CASC Consulting (May 7, 2007 letter) has been provided by Hicks& Hartwick, Inc.

Upon completing the review of the Study, we offer the following comments and recommendations:

- The Proposed hydrology map showed the proposed lot lines and street alignments, but elevations and proposed grading was not shown. To verify the proposed boundaries and conveyance of storm flows a copy of the TTM should be included in the report. Additionally, to assist in the verification of the proposed routing and drainage boundaries, the proposed TTM grading should be added to the proposed hydrology map and the scale increased to show the requested detail. *A response to this issue has not been obtained. Clarification should be provided in the report.*

CIVIL ENGINEERING PLANNING SUVEYING ENVIRONMENTAL ENGINEERING
5053 La Mart Drive, Suite 205 ♦ Riverside, CA 92517 ♦ 951.342.-7990♦ 951.275.01 FAX
www.aei-casc.com

- The proposed condition hydrology calculations show the developed flows increase the peak flow rate downstream of the project and into Big Bear Lake. Per the San Bernardino County Flood Control District Hydrology manual and guidelines, the increased flow rates should be decreased via detention basins to 90% of the existing condition flow rates or demonstrate that the increase in flow will not impact any downstream facilities. Based on the calculations provided the project does not meet this condition. The exemption of this condition should be discussed and approved by San Bernardino County Flood Control District. *A response to this issue has not been obtained. Clarification should be provided in the report or response letter format.*
- The proposed condition hydrology map shows that drainage areas "A" and "F" will be conveyed via roadway culverts and natural stream sections through the project site. Due to the high flow rates and steep terrain it is recommended that a storm drain system be extended to intercept these drainage flows. The flows should include debris and bulking factors in the analysis. San Bernardino County Flood Control District typically requires a bulking factor of 2.0 when a debris analysis is not performed. *A response to this issue has not been obtained. Clarification should be provided in the report.*
- A flood plain analysis was performed for the project. The calculations could not be review since a flood plain map showing the cross sections and floodplain widths was not provided. It is recommended that a map showing the above information be included to support the calculations.
- The proposed condition map shows that a storm drain will be extended from the project site (drainage area "A") to Big Bear Lake. The proposed alignment appears to require the acquisition of a drainage easement and/or right-of-way. Please demonstrate the size of required storm drain and that the proposed facility could be constructed through this area. Also, coordination with the affected property owner to provide the above mentioned rights should be demonstrated to the County of San Bernardino. This issue should be discussed in detail since it appears that the development will impact these existing residents. *A response to this issue has not been obtained. Clarification should be provided in the report.*

It should be noted that some of these comments and recommendations could be addressed in the final design stage of the project. It is at the discretion of San Bernardino County to postpone of eliminate any of the comments and recommendations. If there are any questions or clarifications needed please feel free to call me at 951-342-7990 ext. 105

Sincerely,
AEI-CASC CONSULTING, INC.

Aric M. Torreyson, P.E.
Project Manager
AMT/bc

C.4 - Peer Review Memorandum (AEI CASC, March 2007)

AEI-CASC CONSULTING

Memorandum

To: Ms. Nancy Ferguson
MICHAEL BRANDMAN ASSOCIATES

From: Aric Torreyson, P.E.
AEI-CASC Consulting

Date: March 23, 2007

Re: Moon Camp, Tentative Tract Map 1616

Cc: Ceazar Aguilar, **AEI-CASC Consulting**

Comments to the Engineer:

1st PLAN CHECK COMMENTS

HYDROLOGY AND WATER QUALITY TECHNICAL APPENDIX

AEI-CASC Engineering, Inc. has performed a review of the report entitled, "Moon Camp Tentative Tract 16136, Hydrology and Water Quality Technical Appendix", prepared by R.B.F. Consulting and we offer the following comments:

I. Hydrology Study

- In the narrative, please indicate the rainfall values, slope of intensity duration curve, and antecedent moisture condition values used in the analysis.
- Provide a hydrologic soils map and rainfall charts in the report. Show and

label the general location of the project on all maps and charts.

- For the proposed condition rational method calculations, please verify area "J". (The calculations do not match the tables shown in the narrative)
- Consider creating a large scale land use map – figure 6. (i.e. the information is difficult to read)
- Consider replacing the pictures provided for figure 5 with pictures that are more presentable.
- Please provide a FIRM map showing that there will be no existing flood hazards within the project site.
- For consistency in the narrative, please provide the pipe lengths in the tables.
- Please re-format the rational method output files to display all of the input parameters used. (i.e. slope of intensity duration curves and rainfall values)
- Please provide an R.C.E. stamp. (With signature)
- Please see the report for additional comments.
- It is mentioned in the report that the project will increase the run off to Big bear Lake. It should be noted that San Bernardino County Flood Control Hydrology Manual states that developed flows should be mitigated to 90% of existing flow rates. This project may need to provide this mitigation. Coordination with the district may be a required.

II. Hydrology Map

For the existing condition hydrology map it is recommended that the following information be provided:

- Consider creating a large scale map. (The information is difficult to read)
- Existing drainage facilities, in and around the project site, as appropriate. (and label them).
- Contour elevations.
- Add soil type "D" to the hydrologic data table.
- Label the flow path lengths.
- A vicinity map.
- Provide a leader line for all nodal points.
- Node elevations.
- Street names.
- Delete one of the north arrows.

For the proposed condition hydrology map it is recommended that the

following information be provided:

- Consider creating a large scale map. (The information is difficult to read)
- Existing drainage facilities, in and around the project site, as appropriate. (and label them).
- Contour elevations.
- Add a hydrologic data table. (See the existing hydrology map)
- A vicinity map.
- Street names.

III. Hydraulics Study

1. Please provide preliminary pipe sizes for the cross culverts.

Please include a response to comments letter with the next plan check. Failure to do so may result in the return of submittal without plan check.

Sincerely,

AEI-CASC Consulting, Inc.

Aric M. Torreyson, P.E.
Project Manager

C.5 - Water Supply Analysis (California Collaborative Solutions, February 2009)

Nancy @ MBA

California Collaborative Solutions

Water Supply Analysis

Tentative Tract No. 16136

Moon Camp Tract

Fawnskin, Ca

February 11, 2009

P.O. Box 706 Big Bear City, CA 92314 909 586-5819 calcolsol@gmail.com

Tentative Tract No. 16136 --- Moon Camp

Water Supply Analysis

February 11, 2009

Background:

The Moon Camp Tract was originally proposed as a 92 lot subdivision. An existing, onsite domestic water well, FP2, was proposed to provide the water supply for the subdivision. Well FP2 extracts its groundwater from Sub Area "A" of the North Shore Groundwater Basin. During the evaluation of the Water Supply, it was determined that the Perennial Yield of Sub Area "A" is between 14 and 44 acre-feet per year (Geoscience Support Services, December 2, 2003 Focused Geohydrologic Evaluation, Summary of North Shore Subareas, Page 3, copy attached). The Geoscience Focused Evaluation and the DWP's Master Plan (November, 2006, Table 4-2, copy attached) uses the mid-point of this range, 29 acre-feet per year, as Sub Area A's annual yield. However, County Planning Staff stated that they would only support a project that utilized the most conservative 14 acre-feet per year. ALDA Engineering completed a Final Feasibility Study that determined that 50 lots (occupied full-time) could be served by the 14 acre-feet per year (DWP report dated March 6, 2007, Page 2, copy attached). As a result, the Proposed Subdivision was redesigned as 50, one-half acre minimum lots.

During the preparation of the Draft EIR by MBA, it was discovered that the existing Private Well production within Sub Area "A" is 5 acre-feet per year (Table 4-2, DWP Water Master Plan, November, 2006, copy attached). In order to provide 5 acre-feet per year of groundwater yield to the subdivision from a groundwater basin other than Sub Area "A", the developer has drilled Well FP4 in the adjoining Grout Creek Groundwater Basin. The Grout Creek Basin has a Perennial Yield of 280 acre-feet per year; existing private well production of 7 acre-feet per year; and DWP domestic well production of 121 acre-feet per year (Tables 4-1 and 4-2, DWP Water Master Plan, November, 2006, copies attached). Based on this data, the Grout Creek Basin has 152 acre-feet per year of Perennial Yield available.

Water Well FP2:

In order to produce 9 - 14 acre-feet per year from Sub Area "A", Well FP2 would need to pump at a rate of 5.6 – 8.7 gpm. In June, 2008, Well FP2 was cleaned, pump tested and a Title 22 Water Quality Analysis was performed (Geoscience Support Services Report, August 7, 2008, copy attached). Geoscience concluded:

- Well FP2 can be pumped at a rate of 35 gpm on a long-term basis with less than 10 feet of drawdown in the well (Well FP2 is 380' deep and the static water level is 2 feet below ground surface)
- At the 35 gpm discharge rate, pumping interference with the closest private well is expected to be less than 0.3 feet (the nearest private well is approximately 1,000 feet to the east of Well FP2)

- Title 22 Ground water quality data from Well FP2 indicates the water from the well is suitable for municipal supply

The 35 gpm rate from Well FP2 can produce 56 acre-feet per year and supports Geoscience's Focused Evaluation and the DWP Master Plan's conclusion that Sub Area A can produce 29 acre-feet per year.

Water Well FP4:

In December of 2008, Harich Enterprises drilled Well FP4 to a depth of 240 feet. Well FP4 is located in the north-west corner of the proposed subdivision, within the Grout Creek Groundwater Basin. In order to produce 5 acre-feet per year from the Grout Creek Basin, Well FP4 would need to pump at a rate of 3.1 gpm. Harich pump tested Well FP4 at 3.4 gpm (Harich Driller's Report, February, 2009, copy attached) and the County's Special Districts Department obtained Title 22 Water Quality samples for analysis. The results concluded:

- Well FP4 can be pumped at a rate of 3.4 gpm on a long-term basis with 87 feet of drawdown in the well (Well FP4 is 240 feet deep and the static water level is 22 feet below ground surface)

The 3.4 gpm pumping rate from Well FP4 will produce 5.5 acre-feet per year from the Grout Creek Basin.

Water Service Provider:

Based upon the January 24, 2008 letter from LAFCO Executive Officer Kathleen Rollings-McDonald (copy attached), County Service Area 53C can own and operate the Moon Camp Subdivision Water System, including Water Wells FP2 and FP4. Special Districts staff has stated that they would operate the water system with their existing staff. Currently, Special Districts staff operate the Fawnskin Sewer System through CSA 53B.

Conclusion:

The combined pumping capacity of FP2 and FP4 is more than adequate to meet the long term water supply needs of the proposed 50 lot subdivision without adverse impacts to either Sub-Area "A" of the North Shore Basin, or the Grout Creek groundwater basin.

References:

GEOSCIENCE Support Services Inc., 2003. Focused Geohydrologic Evaluation of the Maximum Perennial Yield of the North Shore and Grout Creek Hydrologic Subunit Tributary Subareas. Prepared for the City of Big Bear Lake, Department of Water and Power. December 2, 2003.

ALDA Engineering, Inc., 2007. Final Feasibility Study to Serve the Proposed Moon Camp Residential Development (Tentative Tract No. 16136). Prepared for the City of Big Bear Lake, Department of Water and Power. March 6, 2007.

Camp, Dresser & McKee, Inc., 2006. Water Master Plan. Prepared for the City of Big Bear Lake, Department of Water and Power. November, 2006.

GEOSCIENCE Support Services Inc., 2008. Results of Rehabilitation and Aquifer Testing Moon Camp Well FP-2. Prepared for California Collaborative Solutions. August 7, 2008.

HARICH Enterprises, 2009. Well FP4 Driller's Report. February, 2009.

Local Agency Formation Commission. 2008. Memorandum, Water Service to Tentative Tract 16136; Moon Camp Residential Subdivision. Prepared by Kathleen Rollings-McDonald, Executive Officer. January 24, 2008.

Focused Geohydrologic Evaluation of the Maximum Perennial Yield of the North Shore and Grout Creek Hydrologic Subunit Tributary Subareas

Prepared for: City of Big Bear Lake Department of Water and Power

December 2, 2003

GEOSCIENCE Support Services, Inc.
Tel: (909) 920-0707
Fax: (909) 920-0403
Mailing: P. O. Box 220, Claremont, CA 91711
1326 Monte Vista Ave., Suite 3, Upland, CA 91786
email: email@geoscience-water.com

- Long-term precipitation records from weather stations within the Big Bear Lake watershed,
- Evapotranspiration data from evaporation pans and weather stations within the watershed,
- Ground water levels, and
- Ground water production.

However, most of the input parameters that are required for a detailed evaluation of the average annual ground water recharge had to be estimated or assumed from data collected outside the Grout Creek and North Shore subunits or outside the Big Bear Lake Watershed due to lack of measured data in the area. Although the assumed values are published and are from reliable sources (i.e. the U.S. Environmental Protection Agency, United States Geological Survey, etc.), they are not specific to the area of interest. Numerous additional monitoring features can be developed to collect the data necessary to refine the ground water recharge estimates. However, priority should be given to the construction of monitoring wells and the development of a reliable ground water level baseline for the tributary subareas.

The results of the ground water recharge analysis for the North Shore Subunit are as follows:

Summary of Ground Water Recharge Results
North Shore Tributary Subareas

Tributary Subarea	Area [acres]	Annual Precipitation [inches]	Average Annual Ground Water Recharge - Low Estimate [acre-ft/yr]	Average Annual Ground Water Recharge - High Estimate [acre-ft/yr]	Average of Ground Water Recharge Estimate Range [acre-ft/yr]
A	247	27.87	14	44	29
B	720	25.45	36	110	73
C	828	23.01	37	107	72
D	558	21.45	22	63	43
E	392	20.01	15	39	27
F	814	18.27	23	66	44

WATER MASTER PLAN

November 2006

Department of Water and Power

Big Bear Lake, California

Mission

The mission of the DWP is to manage our limited water resources through responsible planning in order to assure quality water and essential services in the most cost-effective manner for our current and future customers.

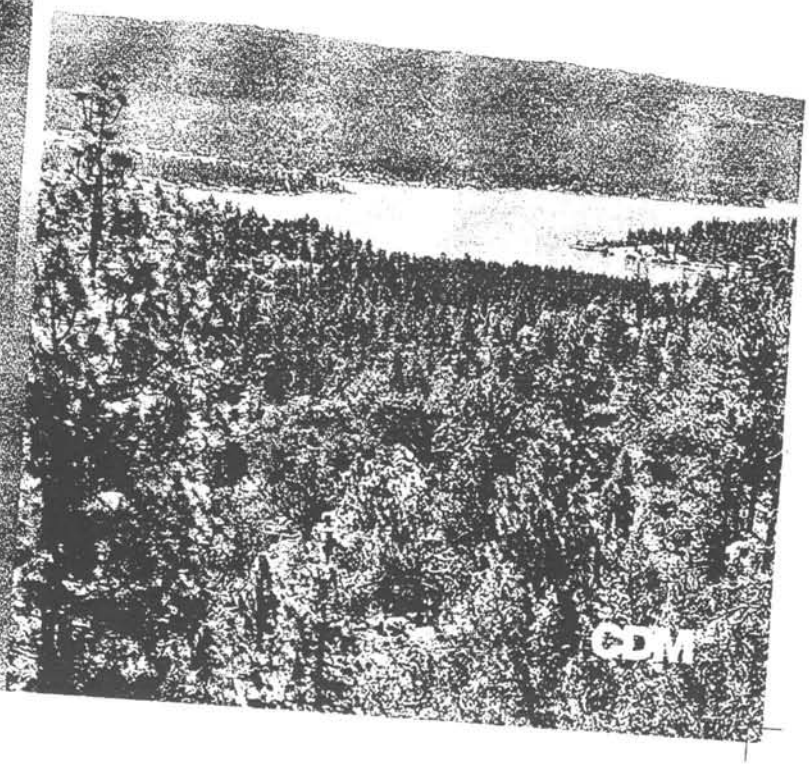


Table 4-1
Current and Projected Annual Demand and Supply Requirements by Pressure Zone

Current and Projected Annual Demand and Supply Requirements by Pressure Zone

Pressure Zone	Current		Full Development			
			25% Full-Time Equivalent		50% Full-Time Equivalent	
	Consumption (ac-ft/yr)	Supply (ac-ft/yr)	Consumption (ac-ft/yr)	Supply (ac-ft/yr)	Consumption (ac-ft/yr)	MDD (gpm)
Erwin Lake / Sugarloaf/ Lake William						
Erwin Lake	87	93	144	154	194	208
Lower Sugarloaf	173	186	225	241	339	363
Upper Sugarloaf	86	92	120	129	201	215
Lake William	28	29	45	48	57	61
Sub-total	374	400	535	572	791	846
Moonridge						
Wolf Booster	31	33	53	56	84	90
Wolf Tank	117	125	162	173	284	303
Lassen	54	58	70	75	104	111
Minton	11	12	17	18	30	32
Traventine	4	5	8	9	14	15
Lower Moonridge	162	173	207	221	286	306
High Timber Ranch	-	-	45	48	64	68
Sub-total	378	405	562	601	865	926
Big Bear Lake						
Town (1)	1,585	1,696	2,370	2,536	2,847	3,046
Conklin Booster	14	15	26	27	41	44
Ironwood Booster	18	19	35	37	48	51
Sub-total	1,617	1,730	2,431	2,601	2,935	3,141
Unmatched	61	65	--	--	--	--
"BIG FOUR" TOTAL:	2,431	2,601	3,527	3,774	4,591	4,913
Fawnskin						
Lower Fawnskin	102	109	172	184	224	240
Upper Fawnskin	19	20	32	35	51	54
Sub-total	121	129	204	219	275	294
Rim Forest	47	50	47	50	47	50
OVERALL TOTAL	2,598	2,780	3,778	4,043	4,913	5,257

(1) Includes Knickerbocker and Ponte pressure zones.

Table 4-2
Maximum Perennial Yield Estimate by Subunit (ac-ft/yr)

Maximum Perennial Yield Estimates by Hydrologic Subunit (ac-ft/yr)			
Subunit	*Perennial Yield Estimate*	*Private Wells Production*	*Available to DWP (ac-ft/yr)*
Grout Creek [1]	280	7	273
Mill Creek	100-175	3	147
Village	250	3	247
Rathbone	1,100	135	965
Division	496	2	494
North Shore			
Sub-Area A [1]	29	5	24
Sub-Area B	71		71
Sub-Area C	70		70
Sub-Area D	43		43
Sub-Area E	27		27
Sub-Area F	44		44
Erwin [2]	890	14	576
TOTAL:	3,400 - 3,475	169	2,981

(1) Assumed to be available to the Fawnskin system only.

(2) Only 576 ac-ft/yr are available to DWP from the Erwin Lake Subunit as an estimated 300 ac-ft/yr are produced by CSD. An additional 14 ac-ft/yr are produced by private wells.

The Perennial Yield from the Grout Creek subunit (280 ac-ft per year) and from Sub A of the North Shore subunit (29 ac-ft per year) is only available to the Fawnskin area. However, only 297 ac-ft per year are available to the DWP as an estimated 12 ac-ft per year are pumped by private wells. Therefore, an estimated 2,684 ac-ft per year are available to DWP to meet the water needs of the "Big Four" system on the south side of the lake. This number assumes that DWP would be able to develop all water sources in the remaining sub-areas in the North Shore subunit given that they are located in United States Forest Service (USFS) lands.

A comparison of supply requirements from Table 4-1 with available local supplies from Table 4-2 indicates that local supplies are capable of meeting current and projected water demands in the Fawnskin system. Local groundwater supplies available to the "Big Four" system are sufficient to meet current water demand of 2,601 ac-ft per year in that system; however, there would be a need to either reduce projected demands through conservation, secure additional supplies, or a combination of both options to meet demands at full development or resulting from conversion to full-time equivalent use. The supply deficit in the "Big Four" is estimated at approximately 1,090 ac-ft per year to meet projected demands at full development assuming the current distribution of full-time equivalent use is maintained; an additional 1,139 ac-ft per year of new supplies would be required to address the impact from demographics.

ALDA Engineering Inc.
9996 Orange Street
Alta Loma, CA 91737
Tel: 909-297-3741
Fax: 909-498-0423

March 6, 2007

Mr. Scott Heule, C.E.G./C.H.G., Assistant General Manager
City of Big Bear Lake
Department of Water & Power
41972 Garstin Drive
Big Bear Lake, CA 92315

Subject: **Final Feasibility Study to Serve the Proposed Moon Camp Residential Development** (Tentative Tract No. 16136)

Dear Mr. Heule:

Pursuant to your request, ALDA Engineering Inc. (ALDA) has conducted a feasibility study to determine the necessary system facilities to serve the above referenced development. This report summarizes the results of our investigation and recommendations. This report presents the project background, an assessment of demand and supply issues, the results of the system analysis, and the recommended improvements.

Project Background

The proposed Moon Camp development consists of 50 residential lots to be developed over approximately 62 acres of land. The proposed development is located along North Shore Drive, in the community of Fawnskin on the north side of Big Bear Lake, and ranges in elevation from approximately 6,750 ft. near the lake to approximately 6,950 ft. in the northeasterly quadrant. Individual lots range in size from approximately half an acre to well over two acres depending on location and are anticipated to be developed as single family residential units; average lot size is approximately one and a quarter acres. Because of its location and lot size, some of the residential units are anticipated to be fairly large and potentially exceed 4,000 square feet in size.

Water service to the proposed development will be provided off the Upper Fawnskin pressure zone as the Lower Fawnskin zone would not provide enough static head to provide the development adequate fire flow. DWP's closest pipeline off the Upper Fawnskin system is a single 6-inch diameter pipeline located near the intersection of Flicker Road and Chinook Road, approximately 2,000 ft away from the westerly boundary of the proposed development. Significant transmission improvements in the Fawnskin system are needed to provide fire flow to the proposed tract.

Currently, there are two groundwater production wells within the proposed residential tract. These wells are located in subarea A of the North Shore hydrologic subunit. It is our understanding that these wells will be deeded to the DWP at the time the tract map is recorded. The developer plans to equip the FP-2 well initially to meet the development projected water demands. The DWP will use excess capacity from this well to help reduce reliance on the leased North Shore Well No. 1. Groundwater production capacity from this well is estimated at approximately 100 gallons per minute. The second well (FP-3), located to the east of the FP-2 well, will not be initially equipped by DWP.

Pressure Zone Service Area

Based on the elevation range of the proposed development, 6,750 ft. to 6,950 ft., the development can be served off the Upper Fawnskin pressure zone. This pressure zone has an operating hydraulic grade of 7,113 ft. set by the high water level of the existing 0.25-million gallon Racoon Reservoir. Based on this hydraulic elevation, static pressures would range from a low of 71 psi at the highest point in Lot 18 to 157 psi near the lake. Individual pressure regulators would be required for all lots with static pressures exceeding 80 psi.

Water supply in the Fawnskin area is provided by two groundwater wells in the Lower Fawnskin pressure zone and by slant wells in the vicinity of the Racoon Reservoir. Excess groundwater production from the Lower Fawnskin pressure zone is conveyed to the Upper Fawnskin pressure zone through a booster station located at the Cline Miller Reservoir.

Water Demand

Projected water demand for the proposed development is based on the average consumption rate of 250 gallons per day per connection. Maximum day demand is estimated based on information provided in the recently completed water master plan and it is equivalent to 1.76 times the average day demand. Therefore, the average and maximum day demands for the proposed 50-lot subdivision are estimated as follows:

- Average Day Demand (ADD) = 12,500 gpd or 8.68 gpm
- Maximum Day Demand (MDD) = 15.27 gpm

Based on an estimated average day demand of 12,500 gallons, the annual water demand for the development is estimated at 4.56 million gallons or 14.00 ac-ft per year.

LOCAL AGENCY FORMATION COMMISSION
COUNTY OF SAN BERNARDINO

215 North "D" Street, Suite 204
San Bernardino, CA 92415-0490 • (909) 383-9900 • Fax (909) 383-9901
E-mail: lafco@lafco.sbcounty.gov
www.sbclafco.org

RECEIVED
JAN 2 ... 2008
... SERVICES DEPT.

DATE: **JANUARY 24, 2008**

FROM: **KATHLEEN ROLLINGS-McDONALD, Executive Officer**

TO: **MATTHEW SLOWIK, Senior Planner**
Advance Planning Division – Land Use Services Department

SUBJECT: **WATER SERVICE TO TENTATIVE TRACT 16136; MOONCAMP RESIDENTIAL SUBDIVISION**

In response to your memorandum, dated January 15, 2008, I would like to provide a description of the three options for water service to this tract and the implications of Government Code Section 56133 to them from the LAFCO staff perspective.

First, Option #1, as previously identified to LAFCO staff, would be for the City of Big Bear Lake Department of Water and Power (hereafter DWP) to extend its infrastructure to serve the entirety of the residential subdivision. As I understand it, a portion of the tract is within the boundaries of the former SoCal Water Company which was condemned and acquired by the City of Big Lake and now operates under the DWP. Pursuant to the provisions of Government Code Section 56133 and LAFCO policies, the DWP has been authorized to continue to expand its services within the former boundaries of the SoCal system without the need for review and approval of LAFCO pursuant to Govt. Code Section 56133, but not beyond. Therefore, a review of the current project with our Special Counsel indicated that Option #1, to extend services by the DWP, was not viable since it would require consideration under §56133 which precludes service outside an agency's sphere of influence. None of the Fawnskin community is within the City of Big Bear Lake sphere of influence.

Please note that there is an area outside the existing DWP boundary defined as the former certificated service area of the SoCal Water Company that is receiving water service from DWP. The agreement between the DWP and Big

Bear Shores Homeowners Association was entered into in 1993, prior to the 1994 enactment of §56133. A copy of this agreement is included as an attachment to this memorandum.

Option #2, as presented to LAFCO staff, was the creation of a Joint Powers Authority (JPA) between the City of Big Bear Lake and County Service Area 53 Improvement Zone C (hereafter CSA 53C) to provide for domestic water service to the area outside the DWP system. CSA 53C was created with water powers to encompass the whole of the North Shore of Big Bear Lake including the entirety of the community of Fawnskin. This option is viable for the provision of domestic water service should it be the choice of the developers of the project.

Option #3, identified by LAFCO staff, would be for CSA 53C to own and/or install the domestic water system required by the project including development of wells and infrastructure and contract with the DWP to operate the system. CSA 53C, as noted above, includes the whole of the Fawnskin community, including areas inside and outside the service area of DWP, and is authorized water service as its only function. In the LAFCO staff view, such a management contract would be exempt from review by LAFCO under provisions of Government Code Section 56133 Subsection (e) which reads as follows:

> *"(e) This section does not apply to contracts or agreements solely involving two or more public agencies where the public service to be provided is an alternative to, or substitute for, public services already being provided by an existing public service provider and where the level of service to be provided is consistent with the level of service contemplated by the existing service provider..."*

The determination of exemption is made by the Commission following the receipt of a written request for consideration. The request shall include a copy of the contract for service, a map delineating the area to be served and a description of the manner in which the service is to be provided. Precedent for this procedure includes the contracts for service between the County (for law enforcement) and County Service Area 38 (Fire protection) and the City of Redlands related to service delivery to the "Donut Hole". A copy of these exemptions is included as an attachment to this memorandum.

Please contact me if you have any questions at (909) 383-9900.

/KRM

Attachments (3)

HARICH ENTERPRISES INC

Michael Perry
California Collaborative Solutions
P.O. Box 706
Big Bear City, Ca 92314

February 12, 2009

RE: Driller's Report and Pump Test for Moon Camp Well FP4

Dear Mr. Perry:

Enclosed please find the Well Completion Report and the results of the 48 hour constant rate pumping test for your Moon Camp Well FP4.

Harich Enterprises drilled Well FP4 at a 12" diameter to a total depth of 240 feet, with the screened interval from 100 to 240 feet and a 60' sanitary seal. Well FP4 is permitted through the County of San Bernardino as a municipal well. The well screen is a 6" diameter Roscoe Moss "Ful-Flo Louver" steel pipe. An Aquarium Sand filter pack was installed per the Special Districts Department specifications.

Static water level in the well was 22 feet measured on 2/4/09. The well was pumped at 3.4 gpm for 48 hours with the drawdown stabilizing at 87 feet (see enclosed Constant Rate Test Drawdown Chart).

Well FP4 was drilled in the northwest corner of the Moon Camp Tract as shown on the enclosed map.

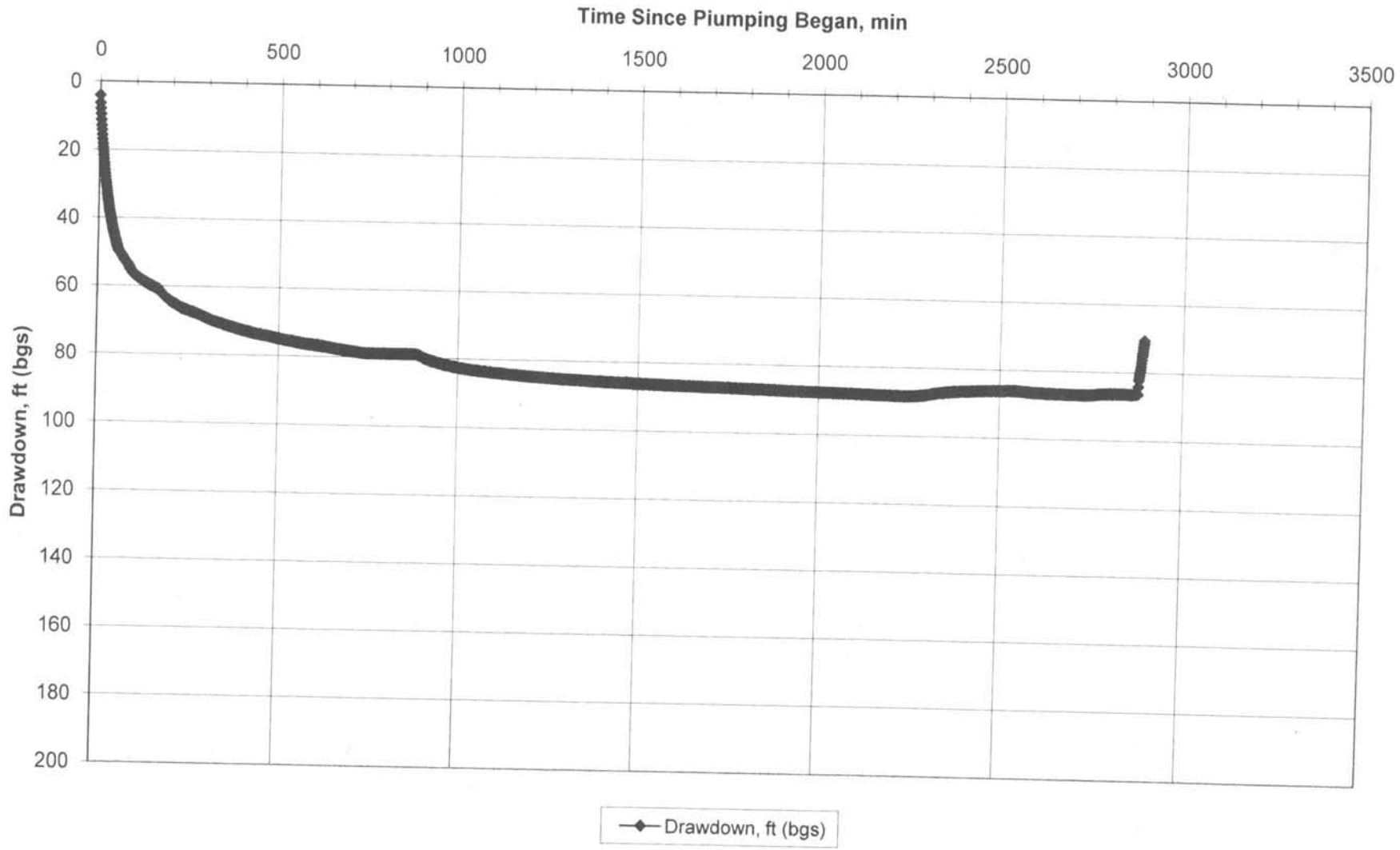
Please call me if you need any additional information.

Sincerely,

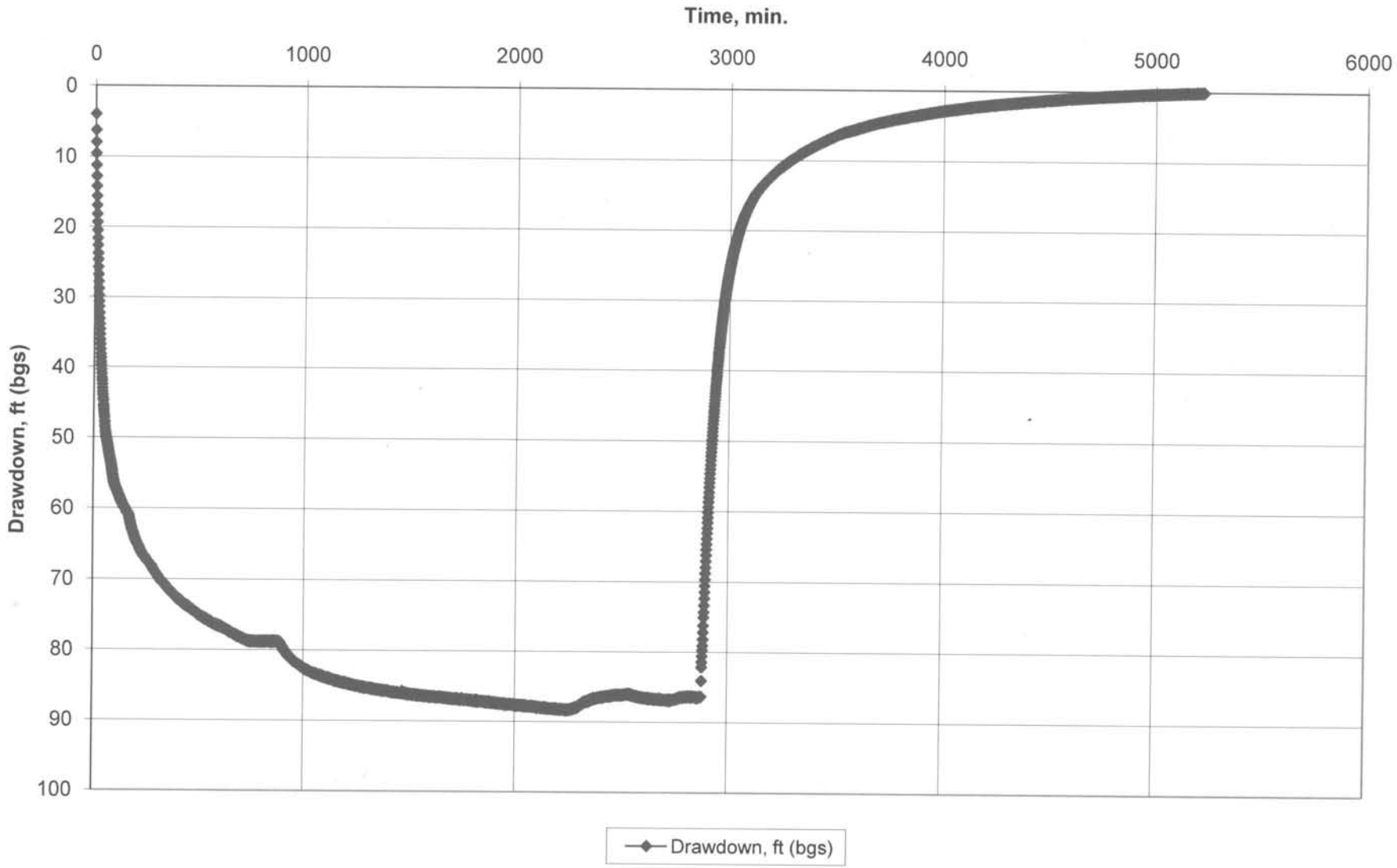
David Harich
Harich Enterprises Inc.

WATER RESOURCES DEVELOPMENT
POST OFFICE BOX 2233 RUNNING SPRINGS, CA. 92382
FAX (909)867-7759 / OFFICE (909) 867-2483

Constant Rate Test Moon Camp Well FP4
Constant Flow Rate at 3.4 GPM



Moon Camp Well FP4 Constant Rate Test at 3.4 GPM



TRIPLICATE
Owner's Copy
Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. e0085096

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO / STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. WELL FP4
Date Work Began 12/17/2009 Ended 2/6/2009
Local Permit Agency SAN BERNARDINO
Permit No. 2008100582 Permit Date 9/26/2008

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID AIR

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION Describe material, grain, size, color, etc.
0	10	BROWN/RED/COBBLES/CLAY
10	20	BROWN/CLAY
20	40	BROWN/CLAY/GRAVELS
40	75	BROWN CLAY/PINK QUARTZITE
75	85	TAN/SANDS/GRAVELS/COBBLES/ 1st WATER
85	110	TAN/PINK/BLACK/COBBLES/SAND
110	120	BROWN/CLAY/GRAVELS
120	140	TAN/SAND (ADDITIONAL WATER)
140	150	TAN/GREY/BROKEN GRANITE(SMALL WATER)
150	240	GREY/SOLID GRANITE

TOTAL DEPTH OF BORING 240 (Feet)
TOTAL DEPTH OF COMPLETED WELL 240 (Feet)

WELL OWNER

Name TIM WOOD MOON CAMP
Mailing Address P.O. BOX 6820
BIG BEAR LAKE CA 92315
CITY STATE ZIP

WELL LOCATION

Address HWY 18 & CANYON RD.
City FAWNSKIN, CA CA 92333
County SAN BERNARDINO
APN Book 0304 Page 091 Parcel 22
Township 2 N Range 1 W Section 13
Latitude 34 15 56 N 116 56 15 W
DEG MIN SEC DEG MIN SEC

LOCATION SKETCH

NORTH
WEST
EAST
SOUTH

See Attached

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and Attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL
MODIFICATION/REPAIR
Deepen
Other (Specify)
DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)

WATER SUPPLY
— Domestic ✓ Public
— Irrigation — Industrial
MONITORING
TEST WELL
CATHODIC PROTECTION
HEAT EXCHANGE
DIRECT PUSH
INJECTION
VAPOR EXTRACTION
SPARGING
REMEDIATION
OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 80 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 22 (Ft.) & DATE MEASURED 2/4/2009
ESTIMATED YIELD 3.4 (GPM) & TEST TYPE PUMP
TEST LENGTH 48 (Hrs.) TOTAL DRAWDOWN 87 (Ft.)
May not be representative of a well's long-term yield

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	60	12"			✓		STEEL	6"	.188	
60	100	12"				✓	STEEL	6"	.188	
100	240	12"		✓			STEEL	6"	.188	.093
							(Roscoe Mo	Ful-flo	Louvered	Pipe)

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	60	✓			
60	240				AQUARIUM SAND

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME HARICH ENTERPRISES, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
P.O. BOX 2233
ADDRESS
RUNNING SPRING CA 92382
CITY STATE ZIP
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
02/10/09
DATE SIGNED
618447
C-57 LICENSE NUMBER

DWR 188 REV 11-97

IF ADDITIONAL SPACE IS NEEDED USE NEXT CONSECUTIVELY NUMBERED FORM

California Collaborative Solutions
Results of Rehabilitation and Aquifer Testing
Moon Camp Well FP-2

August 7, 2008

GEOSCIENCE Support Services, Inc.
P.O. Box 220, Claremont, CA 91711
Tel: (909) 920-0707 Fax: (909) 920-0403
email: email@geoscience-water.com

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CALIFORNIA COLLABORATIVE SOLUTIONS
RESULTS OF REHABILITATION AND AQUIFER TESTING
MOON CAMP WELL FP-2

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TABLE

No.	Description
1	Summary of Required Water Quality Analyses

APPENDICES

Ltr.	Description
A	Pumping Test Data
B	Water Quality Data
C	Microscopic Particulate Analysis

CALIFORNIA COLLABORATIVE SOLUTIONS
RESULTS OF REHABILITATION AND AQUIFER TESTING
MOON CAMP WELL FP-2

1.0 INTRODUCTION

This report summarizes the results of rehabilitation and testing of Well FP-2, located in the vicinity of the proposed Moon Camp development, east of Fawnskin, California (see Figures 1 and 2). Well FP-2 is a potential water source for the development, however, prior to recent activities, it had not been pumped since its construction in 1987. In order to assess the suitability of the well for water supply, GEOSCIENCE developed and implemented a well rehabilitation and testing program.

1.1 Purpose and Scope

The purpose of rehabilitation and testing of Moon Camp Well FP-2 was to:

1) Assess the current condition of the well;

2) Develop a rehabilitation program adequate to restore the specific capacity of the well so that its potential yield and water quality could be evaluated;

3) Implement the rehabilitation and testing program; and

4) Collect and analyze the data necessary for evaluating aquifer characteristics including water quality, potential interference to nearby wells, and possible hydraulic continuity with Big Bear Lake.

The scope of work to address the objectives included:

1) Conducting a downhole video survey of the well;

2) Developing a rehabilitation and testing program and coordinating implementation of the program with a rehabilitation contractor;

3) Implementing the rehabilitation program;

4) Conducting a 72-hour aquifer pumping test;

5) Collecting ground water quality samples from the well and having them analyzed for full Title 22 suite and microscopic particulate analysis (MPA); and

6) Analysis of the data and preparation of the report.

1.2 Background

The Moon Camp Well FP-2 was drilled in 1987 by Howard Pump Company of Barstow, California, using the mud rotary drilling method. A 17-inch borehole was drilled to a depth of 50 ft below ground surface (bgs), below which a 15-inch borehole was drilled to the total depth of 385 ft bgs. Well casing and screen, consisting of 8 1/8-inch inside diameter (ID) mild steel with a 1/4-inch wall thickness was installed to a total depth of 380 ft bgs. The screened portion of the well consists of Johnson Hi-Cap, a type of wire-wrap, located at depths of 60 to 120, 156 to 176, 216 to 278, and 310 to 370 ft bgs. The well was equipped with a 2-inch sounding tube that attaches to the well casing just below the ground surface. The well was filter packed using an 8 x 16 Monterey Sand from the total borehole depth to 53 ft bgs. A 2-foot bentonite layer was placed above the filter pack from 51 to 53 ft bgs and a cement annular seal was placed above the bentonite layer from 51 ft bgs to the ground surface.

Following well construction, the well was developed by bailing and pumping. Following development, an 8-hour variable rate (step drawdown) test was performed. During this test, a maximum discharge rate of 100 gallons per minute (gpm) was achieved with a pumping water level of 26 ft bgs. The specific capacity calculated from data collected during this test was approximately 5 gpm per foot of drawdown.

2.0 DOWNHOLE VIDEO SURVEY

On May 2, 2008, Pacific Surveys, LLC, conducted a downhole video survey of Well FP-2. GEOSCIENCE personnel were on site to note observations made during the survey and to direct the operation of the camera as necessary.

At the time of the video survey, the depth to static ground water level was approximately 2 ft bgs. The camera reached a depth of approximately 376 ft bgs before visibility within the water column became so reduced (i.e. blackout conditions) as to warrant the removal of the camera.

The video survey showed that the blank well casing and screen was locally scaled and corroded although no obvious structural damage was observed. The blank well casing was coated with moderate to heavy scale, with encrustants occurring in localized patches, particularly along welded casing joints. Large mounds of encrustants became more frequent and larger with depth. The wire-wrapped screen sections showed minor to complete clogging with some localized patches of encrustants and tubercles. Where screens were open, no filter pack could be seen through the screen apertures. Some of the encrusting material was observed to be relatively fragile and brittle and became dislodged from contact with the video camera.

3.0 WELL REHABILITATION PROCEDURE

Based on review of the video log, GEOSCIENCE developed a chemical and mechanical rehabilitation program for Well FP-2[1]. Rehabilitation was performed by Roadrunner Drilling & Pump Company of Winnemucca, Nevada (Contractor). The rehabilitation program was initiated on June 27, 2008.

Initial rehabilitation of Well FP-2 included mechanical dislodging of encrusted material throughout the wetted portion of the well casing and screen using a spirally-wound nylon brush. Scale and debris were dislodged by gently raising and lowering the brush throughout the specified area. The Contractor brushed each wetted foot of blank well casing for one minute and each wetted foot of screen for two minutes, for a total of 10 hours brushing time. Following brushing, a bailer was used to remove material that had accumulated at the bottom of the well.

The well was disinfected through a combination of acidification and chlorination. Using a tremie pipe, acid was introduced throughout the length of the well. The acid was mixed into the screened portion by gently lifting and lowering a bailer tool. Once the pH of the well water had been lowered to approximately 4.5 pH units, a chlorine solution was added through the tremie pipe and worked into the screened portion of the well by lifting and lowering the bailer. Once the chlorine concentration of the water in the well exceeded 200 milligrams per liter (mg/L), the well was allowed to sit idle for 24 hours.

Following chlorination, the Contractor continued rehabilitation of Well FP-2 using a combination swab and airlift tool. Swabbing was accomplished by gently lifting and lowering the double-packer tool opposite 10-foot sections of the well screen, effectively dislodging any remaining biofilm and/or fine-grained sediment from the gravel pack and near well zone. Following several passes with the swab tool through a 10-foot screened interval, the interval was

[1] Letter to Michael Perry dated May 9, 2008

pumped (air lifted) using the tool until the discharged water was clear and free of sediment. The screened portion of the well was swabbed and airlifted for a total of 20 hours.

Following swabbing and airlifting, a submersible test pump was installed within the well for final development and testing. The test pump intake was installed at a depth of approximately 130 ft bgs. Initial pumping was performed at a relatively low flow rate (approximately 30 gpm) and was gradually increased as water clarity improved and sand production decreased. Pumping was periodically interrupted to surge the well, a process where water in the pump column is allowed to flow back into the screened section of the well. This process was repeated until the discharge water was clear and the sand content was less than 0.1 parts per million (ppm). The well was developed by pumping for approximately 11 hours. The maximum discharge rate during development was approximately 150 gpm with approximately 25 feet of drawdown.

4.0 AQUIFER PUMPING TEST

A 72-hour variable rate (step-drawdown) pumping test was conducted at Well FP-2 during the period from July 1 to 4, 2008. The well was pumped in 24-hour "steps" at average discharge rates of 35 gpm, 60 gpm and 105 gpm (see Figure 3). During the pumping test, the pumping water level, discharge rate, and sand content were closely monitored (see Appendix A). Ground water levels in a nearby private well, referred to as the Fujimoto Well (see Figure 2), were also monitored during the pumping test. The pumping test was followed by 4 hours of recovery measurements in both the pumping well and the observation well. The field procedure for the pumping test followed the American Society for Testing and Materials (ASTM, 1994), Standard Test Method D4050.

4.1 Pumping Test Methodology

4.1.1 Basic Assumptions Used in Analysis of Pumping Test Data

The purpose of a pumping test is to obtain field data, which when substituted into an equation or set of equations, will yield estimates of well and aquifer properties. As certain assumptions have been used to derive these equations, it is important to consider or control these factors during the test. These assumptions are:

- The aquifer material is assumed to consist of porous media, with flow velocities being laminar and obeying Darcy's law.
- The aquifer is considered to be homogeneous, isotropic, of infinite aerial extent, and of constant thickness throughout.
- Water is released from (or added to) internal aquifer storage instantaneously upon change in water level.

- No storage occurs in the semi-confining layers of leaky aquifers.
- The storage in the well is negligible.
- The pumping well penetrates the entire aquifer and receives water from the entire thickness by horizontal flow.
- The slope of the water table or piezometric surface is assumed to be flat during the test with no natural (or other) recharge occurring, which would affect test results.
- The pumping rate is assumed constant during the entire time period of pumping during a constant-rate test, and constant during each discharge step in a variable-rate test.

4.1.2 Theis Equation

Estimation of aquifer parameters from pumping test data is based on analytical solutions of the basic differential equation of ground water flow that can be derived from fundamental laws of physics. One of the most widely used solutions of this equation for non-steady radial flow to wells is the "Theis Equation":

$$s(r,t) = \frac{114.6Q}{T} W(u) \qquad \text{"Theis Equation"} \qquad (1)$$

where:

s(r,t) = Drawdown in the vicinity of an artesian well, [ft]
r = Distance from pumping well, [ft]
Q = Discharge rate of pumping well, [gpm]
T = Transmissivity of aquifer, [gpd/ft]
W(u) = "Well function of Theis"
u = $\frac{1.87r^2S}{Tt}$

where:

S = Storativity, [fraction]

t = Time after pumping started, [days]

4.1.3 Jacob's Straight-Line (Modified Theis Non-Equilibrium) Method

According to Jacob (1950), for small values of "u" ($u < 0.05$), the Theis equation may be approximated by Jacob's equation:

$$s(r,t) = \frac{264Q}{T}\log\left(\frac{0.3\,Tt}{r^2 S}\right) \qquad \text{"Jacob's Equation"} \qquad (2)$$

Jacob's equation is valid for use for most hydrogeologic problems of practical interest, is easier to use than the Theis equation, and involves a simple graphical procedure to estimate transmissivity and storativity. This method (D 4105) is summarized by ASTM (1994).

Transmissivity (T, in gpd/ft) can be estimated as:

$$T = \frac{264Q}{\Delta s} \qquad (3)$$

where:

Q = Pumping rate, [gpm]

Δs = Change in drawdown over one log cycle of time, [ft]

4.2 Pumping Well

Well FP-2 served as the pumping well for the 72-hour constant rate pumping test. The static ground water level in the well was measured to be approximately 6 ft bgs prior to the start of pumping. Ground water levels were measured during the pumping test and recovery phase using a downhole pressure transducer programmed to collect measurements at one-minute intervals. Additionally, an electric wireline sounder was used to manually collect ground water levels in FP-2 during the pumping and recovery phases.

The discharge rate was monitored with a flowmeter equipped with a totalizer and instantaneous rate gauge. During the course of the 72-hour pumping test, Well FP-2 pumped at average discharge rates of 35, 60, and 105 gpm (Steps 1, 2, and 3, respectively). The total volume of ground water pumped during testing was 289,350 gallons.

Ground water samples were collected during the 72-hour step test after approximately 44 hours of pumping (July 2, 2008). The samples were submitted to E.S. Babcock & Sons, Inc. of Riverside, California for analysis of constituents required by the State of California Code of Regulations Title 22 Rule as well as other selected constituents. A complete list of the constituents tested and their detection limits are provided in Table 1. Laboratory results of the water quality testing are presented in Appendix B.

A microscopic particulate analysis (MPA) was performed during the first 24 hours of the step drawdown test. After approximately 1,000 gallons of discharge water were run through a filtering apparatus, the filter was submitted to BioVir laboratories, Inc. of Benicia, California. The sample was analyzed according to EPA Method 910/9-92-029 including *Giardia* species and *Cryptosporidium*. Results of the MPA are presented in Appendix C.

4.3 Observation Well

Ground water levels were monitored before, during and after the pumping test in an observation well (a private well referred to as the Fujimoto Well) located approximately 910 ft east of Well FP-2. Water level measurements were collected and recorded in this well using a pressure transducer.

5.0 PUMPING TEST RESULTS

5.1 Production Well (FP-2)

As shown on Figure 3, Well FP-2 can be pumped at a rate of 35 gpm on a long-term basis with less than 10 ft of drawdown in the well. The well can also sustain a pumping rate of 105 gpm on a long-term basis although the rate of ground water level decline is greater. Analysis of the 105 gpm step using Jacob's straight-line interpretation shows an aquifer transmissivity of approximately 14,600 gallons per day per foot of drawdown (gpd/ft; see Figure 4). At a pumping rate of 105 gpm, the specific capacity of FP-2 is approximately 4.7 gpm/ft.

The specific capacity (the inverse of specific drawdown), of the well during Step 1 was less than the specific capacity measured during Steps 2 and 3. This results in a negative trendline when plotting specific drawdown with discharge rate, and thus, well efficiency cannot be calculated (see Figure 5).

Calculated recovery is a method of analysis whereby extrapolated drawdown data is compared to actual recovery data from the pumping well. It can be used to calculate transmissivity using Jacob's straight line interpretation in a similar manner as used with the pumping drawdown data. Results of the calculated recovery analysis for well FP-2 shows an aquifer transmissivity of approximately 8,900 gpd/ft (see Figure 6). Residual drawdown analysis, a method whereby residual drawdown (the difference between the static and recovering water level) is plotted with respect to the ratio between the time since pumping stopped and the time since pumping started, can also be used for calculating aquifer transmissivity using Jacob's straight line interpretation. Results of the residual drawdown analysis for Well FP-2 shows an aquifer transmissivity of approximately 9,600 gpd/ft (see Figure 7).

5.2 Observation Well

Ground water level data collected from the observation (Fujimoto) well, located approximately 910 ft east of Well FP-2, during the pumping test shows minor ground water pumping interference that can be attributed to pumping of Well FP-2. Given that the Fujimoto well was an actively pumping well that cycled on and off periodically during the pumping test, it was necessary to interpret pumping interference from Well FP-2 through the ground water level "noise" of the pumping observation well. To account for this, static ground water levels were used to interpret interference trends (see Figure 8). Interpretation of static ground water trends during the pumping test shows a decline of approximately 0.3 ft that can be attributed to interference from pumping Well FP-2 at a rate of 35 gpm.

5.3 Ground Water Quality

Ground water quality data from Well FP-2 indicate that water produced from the well is suitable for municipal supply. The water is of calcium-bicarbonate type (see Figure 9). The total dissolved solids (TDS) concentration was reported to be 300 mg/L, below the recommended California Department of Public Health (CDPH) secondary maximum contaminant level (MCL) of 500 mg/L. Toluene was detected at a concentration of 1.2 micrograms per liter (µg/L), below the CDPH primary MCL of 150 µg/L, and is likely from materials used during installation of the test pump. Chloroform was detected at a concentration of 0.98 µg/L, below the USEPA MCL of 80 µg/L for trihalomethanes, and is likely a by-product of the chlorine used during rehabilitation of the well casing and screen. All other detected constituents were below their respective MCLs or notification levels.

The results of the water quality analyses are summarized in the following table:

Water Quality Analytical Data – Moon Camp Well FP-2

		Analysis Result	Drinking Water Regulatory Standards
Aluminum	[µg/L]	< 50	200[2]/1,000[1]
Arsenic	[µg/L]	< 2.0	10[1]
Boron	[µg/L]	< 100	1,000[3]
Chloride	[mg/L]	2.7	250-500[2]
Chromium, Hexavalent	[µg/L]	< 1.0	50[1,4]
Chromium, Total	[µg/L]	1.1	50[1]
Color	[Color Units]	< 3.0	15[2]
Fluoride	[mg/L]	< 1.0	2.0[1]
Iron	[µg/L]	< 100	300[2]
Manganese	[µg/L]	< 20	50[2]
Nitrate (as NO_3)	[mg/L]	< 1.0	45[1]
Odor	[TON]	< 1.0	3[2]
Perchlorate	[µg/L]	< 4.0	6[1]
pH	[pH Units]	7.5	6.5 - 8.5[5]
Silica, Total	[mg/L]	25	NA[6]
Specific Conductance	[µmhos/cm]	510	900-1,600[2]
Sulfate (as SO_4)	[mg/L]	5.2	250-500[2]
Surfactants (MBAS)	[mg/L]	< 0.05	0.5[2]
Total Dissolved Solids (TDS)	[mg/L]	300	500 - 1,000[2]
Total Hardness	[mg/L]	270	NA[6]
Turbidity	[NTU]	0.39	5[2]
Vanadium	[µg/L]	< 3.0	50[1]
1,2,3-Trichloropropane	[µg/L]	< 0.005	0.005[1]
Gross Alpha	[pCi/L]	1.74 +/- 1.33	15[1]
Radon	[pCi/L]	447 +/- 43.1	300-4,000[7]
Volatile Organic Compounds (EPA Method 524.2) except as noted below:	[µg/L]	ND	Varies with Chemical[1]
Chloroform	[µg/L]	0.98	80[8]
Toluene	[µg/L]	1.2	150[1]

1 California Department of Public Health (CDPH) primary maximum contaminant level (MCL)
2 CDPH secondary MCL.
3 CDPH notification level for unregulated chemicals.
4 Chromium-6 (hexavalent chromium) is regulated by CDPH under the 50 µg/L total chromium MCL.
5 United States Environmental Protection Agency (USEPA) secondary standard for pH.
6 Not Applicable – no current MCL.
7 USEPA proposed MCL and alternative MCL.
8 Chloroform is regulated under the 80 µg/L USEPA MCL for total trihalomethanes.

ND Not detected above laboratory detection limit.
BOLD Equal to or above current CDPH MCL or notification level.

5.4 Microscopic Particulate Analysis

Microscopic particulate analysis (MPA) did not show any primary or secondary particulates in the well discharge, with the exception of plant pollen. The plant pollen identified was determined to be pine pollen, and is likely an airborne contaminant that contacted the sampling apparatus during field set-up. Given this, there is no evidence from the MPA that the ground water produced by Well FP-2 is under the direct influence of surface water in Big Bear Lake. A copy of the complete MPA report is presented in Appendix C.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the data collected during this investigation, we have developed the following conclusions:

- Well FP-2 has successfully been rehabilitated and its specific capacity restored to near original levels;
- Extreme care should be exercised when equipping or redeveloping the well in the future to avoid damaging the wire-wrap screen. Although no clear damage was visible from the video survey, the screen design is fragile and can easily be damaged;
- Well FP-2 can yield up to 35 gpm on a long-term basis with less than 10 ft of drawdown;
- At the 35 gpm discharge rate, pumping interference with the closest private well is expected to be less than 0.3 ft;
- Ground water quality data from Well FP-2 indicates the water from the well is suitable for municipal supply;
- Microscopic particulate analysis of discharge water detected pine pollen on the sampling filter. However, the detection was likely the result of an airborne contaminant and not from ground water under the direct influence of surface water. Confirmation sampling and analysis may be necessary to verify this conclusion prior to permitting the well with the CDPH.

7.0 REFERENCES

American Society for Testing and Materials. 1994. ASTM Standards on Ground Water and Vadose Zone Investigations. 2nd Edition.

Jacob, C.E., 1950. Engineering Hydraulics. J. Wiley and Sons, New York.

Driscoll, Fletcher G., 1986. Groundwater and Wells. Second Edition. U.S. Filter/Johnson Screens, St Paul Minnesota.

C.6 - Water Supply Analysis (California Collaborative Solutions, May 2009)

California Collaborative Solutions

Water Supply Report

Tentative Tract No. 16136

Moon Camp Tract

Fawnskin, Ca

May 14, 2009

P.O. Box 706 Big Bear City, CA 92314 909 586-5819 calcolsol@gmail.com

performed above indicates that new estimates of this planning number may be lower in the future. Please feel free to contact me if you have any questions.

Thank you for your interest,

William S. La Haye
Water Resource Manager
Big Bear Lake DWP

Department of Water

May 6, 2009

Michael Perry
California Collaborative Solutions
Post Office Box 706
Big Bear City, CA 92314

Re: Moon Camp Water Feasibility Study – 250 gpd/lot

Dear Mr. Perry,

This letter is in response to your question regarding the Big Bear Lake Department of Water and Power's (DWP's) use of 250 gallons per day (gpd)/lot in the Moon Camp Water Feasibility Study. Currently, the DWP uses 250 gpd/lot for all feasibility studies for new subdivisions and this is based on historical water demand of customers within the DWP's service area.

In our 2006 Master Plan, the engineering firm contracted to produce this plan calculated our daily average water use at 165 gpd (2,720 af/14,748 customers) using 2002 water use data, and added 65 gpd for unaccounted for water and demographic factors to equal 230 gpd/customer. Prior to this work, the DWP had been using 250 gpd/lot as its planning number. The Master Plan analysis confirmed this number was reasonable and we still use it.

The calculations described above were produced with water use data collected prior to the implementation of an extremely aggressive water conservation program. Between 2001 and 2005, the water demand within our service area declined 18%. Most of these conservation measures are still in effect and the water demand within our service area remains well below the peak demand recorded in 2001. Considering we now have 950 (7%) more customers than in 2002, maintaining water demand more than 15% below the 2001 peak is encouraging.

Customer water demand was 2,424 acre feet in 2008 and the number of DWP customers that year was 15,698, which yields an average of 138 gpd/customer. If we add the same figure for unaccounted for water and demographics (65 gpd/customer), as was done in 2006, the current planning number estimate would be 203 gpd/customer. This is 19% lower than the 250gpd/customer planning number used in the Moon Camp Feasibility Study.

While the DWP has not updated the 250 gpd/lot planning number since 2006, we feel this number is the best available estimate for planning purposes at this time. The simple analysis I

California
Collaborative
Solutions

909 586-5819
P.O. Box 706
Big Bear City, CA 92314
calcolsol@gmail.com

May 14, 2009

Wes Reeder
County Geologist
Land Use Services Department
County of San Bernardino
385 North Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415-0181

Re: Moon Camp Tract Water Supply

Wes,

Enclosed please find the items / responses to your requests regarding the Moon Camp Tract Water Supply:

1. May 6, 2009 letter from the DWP's Water Resource Manager, William La Haye, explaining the basis for the DWP's use of 250 gallons per day (gpd) in their Water Feasibility Studies for new development.

2. Copies of the DWP's Water Usage Restrictions / Water Conservation Regulations including Ordinance No. 2005-348; Conservation Stage 1 Water Use Restrictions; Residential Tiered Water Rates; Spring & Summer Water Conservation Guide; and Fall & Winter Conservation Guide.

3. May 1, 2009 letter from Tom Harder, Groundwater Consulting, addressing your questions:
    - The minimum perennial yield for Sub Area A
    - His opinion of the potential impacts of pumping Well FP2 on Big Bear Lake
    - His opinion of potential impacts associated with utilization of Well FP4 as a supplemental water source

4. Our request to the DWP for their conceptual approval of Water Service Alternative #1 – interconnection of the Moon Camp Tract's pipelines and wells with the DWP's Fawnskin Water system in order to provide water storage and fire flow to the Tract. (Water Service Alternative #2 is the construction of an independent water system on the Tract including reservoir and fire booster station)

5. Figure 2-1, DWP Service Area, and Figure 5-1, DWP Existing Facilities, from the DWP November 2006 Master Plan; Exhibit 2-3, Land Use Designations, from the Moon Camp Draft EIR; and the DWP's September 2, 2008 Figure 1, DWP Service Area and Tributary Subarea Boundaries. These Figures and Exhibit show that the only remaining undeveloped private land within Sub Area A is a 6.8 acre parcel of land to the north of the Moon Camp Tract. This parcel is within the DWP's service area and will be served from the Grout Creek Groundwater Basin through the existing DWP water line in Flicker Road that dead ends into the western boundary of the 6.8 acre parcel.

As we discussed, the Draft EIR will include the statement: "The pumping of Well FP2 within Sub Area A of the North Shore Groundwater Basin to supply the Moon Camp Tract will be limited to 9 acre feet per year until the water purveyor can demonstrate that more than 9 acre feet per year can be withdrawn without adverse impacts to Sub Area A and the private well owners who also pump from Sub Area A."

Please call me if you have any questions.

Sincerely,

Michael Perry

Michael Perry
California Collaborative Solutions

DWP's Water Conservation / Water Usage Restrictions

The average water demand in the San Bernardino Valley (and other areas of California) is much higher than in the Big Bear area as most houses off the mountain have extensive green landscape areas to water. The DWP has been a leader in water conservation by implementing:

- Significantly increasing Tiered Water Rate Structure - $2.06/ccf to $9.77/ccf (copy attached)
- All indoor water fixtures are required to be low flow / low flush (new construction and at change of ownership)
- Water Conservation Landscape Ordinance (copy attached):
    - Limiting turf to 500 square feet for each property and approval by DWP
    - Turf irrigation must include an automatic controller that incorporates evapo-transpiration and rain shutoff features
    - Sprinklers are only allowed for turf. All other landscape plantings must be irrigated with efficient, low water use devices, such as, drip systems or bubblers.
    - All outdoor irrigation systems shall be shut off and winterized between Nov 1 – Apr 1
    - All new developments are required to install low water use landscape elements
    - Landscape plans must be approved by the DWP when proposed landscape exceeds 1,000 square feet
    - Landscape plans must demonstrate their adherence to Xeriscape principles
- Stage 1 Water Use Regulations (copy attached):
    - No washing of sidewalks, walkways, driveways, patios, porches, buildings from a hose
    - Outdoor irrigation limited to every other day
    - Outdoor irrigation before 9 am and after 6 pm only
    - No water used for compaction or dust control
    - No flooding or runoff onto driveways or streets
    - Vehicle washing using a bucket and hose equipped with an automatic shutoff nozzle

As shown in the Landscape Ordinance, outdoor irrigation in Big Bear only occurs for a maximum of 7 months a year. Due to the cold spring / fall climate, only 4 months, June – September, are warm enough for what would be called, "normal outdoor irrigation".

As shown above, water usage in Big Bear is required to be significantly different than what occurs in the San Bernardino Valley and elsewhere in California.

DEPARTMENT OF WATER (DWP)

RESIDENTIAL WATER RATES FOR 2 MONTHS

SERVICE CHARGES: (5/8" Meter)

Operation & Maintenance	$ 8.36
Debt Service	$ 35.60
System Rehabilitation Fee	$ 15.82
Total Minimum Billing Every Two Months:	**$ 59.78**

WATER USAGE CHARGE

1 unit = 1 ccf = 100 cubic feet = 748 gallons

Tier 1	First 24 ccf	$ 2.06 each
Tier 2	Next 16 ccf (25 to 40 ccf)	$ 2.86 each
Tier 3	Next 20 ccf (41 to 60 ccf)	$ 4.27 each
Tier 4	Next 40 ccf (61 to 100 ccf)	$ 7.04 each
Tier 5	All usage over 100 ccf	$ 9.77 each

The service charge and rehabilitation fees are "readiness to serve" charges applicable to all connected services. This amount is charged regardless of any water usage or whether the service is turned on or off. The purpose of the service charge is to keep the water system in a condition that is ready to serve ALL our customers at any given time. Approximately 60% of your service charges go to repay the debt for the purchase of the Water System. The remainder of the service charge (and all the usage fees) are used to fund the Operations and Maintenance Budget. The rehabilitation fee is specifically designated to fund the needed improvements to the Water System.

41972 Garstin Drive, P.O. Box 1929, Big Bear Lake, CA 92315-1929 • (909) 866-5050
www.bbldwp.com

Rev. 7/08

Department of Water

City of Big Bear Lake
41972 Garstin Drive, Big Bear Lake, CA 92315
909-866-5050

CONSERVATION STAGE I: WATER-USE REGULATIONS

All Department of Water (DWP) customers in the Big Bear Valley are under **Stage I Water Shortage Emergency Regulations, with the exception of Lake William, which is under Stage II Water Shortage Emergency Regulations.** Conservation stages are determined by the Board of Commissioners based on many variables, some of which are the current ground water levels, recent ground water level trends, prior year precipitation and water demand, and current and anticipated water demand. Current Stage I regulations include, but are not limited to the following:

- Outdoor irrigation will be permitted every other day based on the customer's address and the current date. **See reverse side for details.**
- All new landscapes and existing landscape modifications greater than 1,000 square feet require a landscaping permit prior to beginning work.
- New turf installations may not exceed 500 square feet in size, and must be permitted prior to installation. **See reverse side for details.**
- Irrigation systems must be shut down from November 1st to April 1st.
- No DWP water may be used for soil compaction or dust control.
- No washing of sidewalks, walkways, driveways, parking areas, patios, porches or verandas, buildings and structures using water from a hose except when needed to protect public health and safety.
- No water shall be used to clean, fill, operate, or maintain levels in decorative fountains unless such water is part of a recycling system.
- All water leaks must be repaired in a timely manner.
- Noncommercial washing of private vehicles, trailers, buses or boats must be conducted through the use of a bucket and a hose equipped with a shut-off nozzle.
- There shall be no use of water from a fire hydrant, except for fire protection purposes.
- There shall be no flooding or run-off in driveways or streets.

FOR A COMPLETE LIST OF THE WATER-USE REGULATIONS, PLEASE CALL THE CONSERVATION DEPARTMENT AT (909) 866-5050 OR VISIT WWW.BBLDWP.COM.

Oudo Water Saving Tips

- **Lay mulch around trees and plants** at least one to two inches deep to retain moisture, slow evaporation, and discourage weed growth.
- **Weeds are water thieves,** robbing your plants of water and nutrients. Try to keep your lawn and garden weed-free.
- **Set a kitchen timer or invest in a sprinkler timer to help prevent over watering.** A lot of water can be wasted in a short period of time if you forget to turn your sprinklers off.
- **If it doesn't grow, don't water it.** Position sprinklers so water doesn't land in the gutters or on any paved areas.
- **Don't water on windy days.** Water will go everywhere except where it is needed.
- **Consider installing drip irrigation systems.** Drip irrigation systems allow water to flow slowly to roots and also reduce water loss due to evaporation.
- **Check for leaks** in pipes, hoses, faucets, and couplings. Leaks can waste a lot of water.

Xeriscape

It's a Smart Choice

Salvia

Xeriscape is an attractive, sustainable landscape that conserves water and is based on sound horticultural practices. Simply stated, Xeriscape is a landscape that is water wise – using water conservatively in the landscape without wasting. Creating sustainable landscapes is one way that homeowners can lessen the impact on the local environment. Xeriscaping encourages the use of a wide variety of durable plants to create a low-maintenance landscape that is well matched to its region. Planting a beautiful Xeriscape landscape can attract hummingbirds, butterflies and beneficial insects, while enhancing the value, comfort and appearance of your property.

Outdoor Wate g Schedule

- Before 9:00 a.m. and after 6:00 p.m.
- Every other day based on your address and the current date. If your address ends in an even number, you can water on the even days of the week, such as the 2nd, 4th, etc.

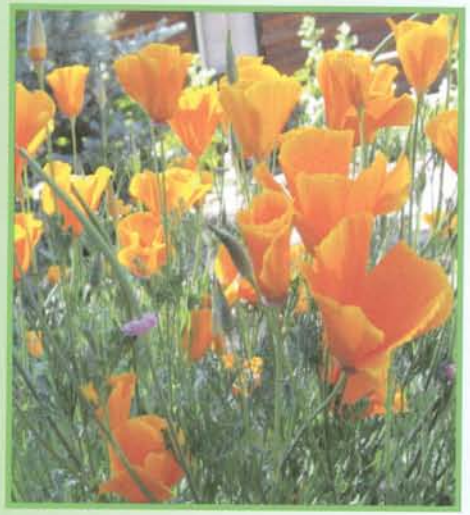
Outdoor Watering Guidelines

Additional outdoor watering restrictions include, but are not limited to:

- New turf installations plus existing turf, may not exceed 500 square feet in size, and must be approved by the DWP prior to installation.
- No washing of sidewalks, walkways, driveways, parking areas, patios, porches or verandas, buildings and structures using water from a hose except when needed to protect public health and safety.
- No water shall be used to clean, fill, operate, or maintain levels in decorative fountains unless such water is part of a recycling system.
- Non-commercial washing of private vehicles, trailers, buses or boats must be conducted through the use of a bucket and a hose equipped with a shut-off nozzle.
- No flooding or run-off in driveways or streets.
- All water leaks must be repaired in a timely manner.

Plant Smart **Water Smart**

Spring & Summer Guide

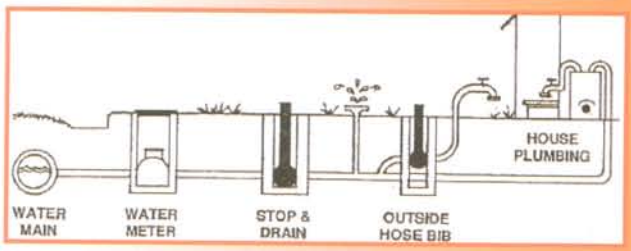


California Poppy

Department of Water and Power

City of Big Bear Lake
41972 Garstin Drive
Big Bear Lake, CA 92315
909-866-5050

P MBING DIAGRAM



ALTERNATIVE FREEZE PREVENTION

Instead of draining your home's water system, you may heat the home to avoid freezing pipes. However, leaving your thermostat at 45 to 55 degrees does NOT always ensure that the pipes will not freeze. Winter storms may cause power outages, which will cause some heating systems to shut off, resulting in frozen pipes.

IF YOUR PIPES FREEZE

- If you turn on the faucets and nothing comes out, call the DWP. We can send a field employee to your home to help evaluate the situation.
- If you have detected that your pipes are frozen, you may need to call a plumber or wait for the pipes to thaw out. Turning up the home's thermostat might help unfreeze the pipes.
- Open all faucets in the house. When water freezes, it expands by 1/5th its original volume. By relieving pressure, due to the expanding water, you may avoid additional pipe damage.
- Once your pipes have thawed, it is important that you carefully inspect your home for any signs of a leak. The freezing of the pipes could have caused a pinhole leak, hairline break, or large crack.

DWP (909) 866-5050

FALL G/ ENING

Fall is the perfect time for assessing, designing, and improving your landscape. The little effort you make now will help your garden survive the cold winter and thrive in the springtime.

Fall To Do Items

- Adjust your irrigation schedule to reflect your plants' reduced water needs. Turn off irrigation by November 1st.
- Prune any diseased or stressed tree and shrub limbs now, while the healthy parts of the plant are more easily differentiated.
- Cut back flowers that have stopped blooming. Wildflower and perennial seeds can be harvested and sown now or before the first snowfall.
- Eliminate weeds. Each weed you eliminate now will prevent possibly hundreds of weeds from sprouting in the spring.
- Plant your spring bulb garden now.
- Plant trees and shrubs. The soil is still warm from summer, encouraging healthy root growth.
- Mulch to help protect plant roots from fluctuating soil temperatures.

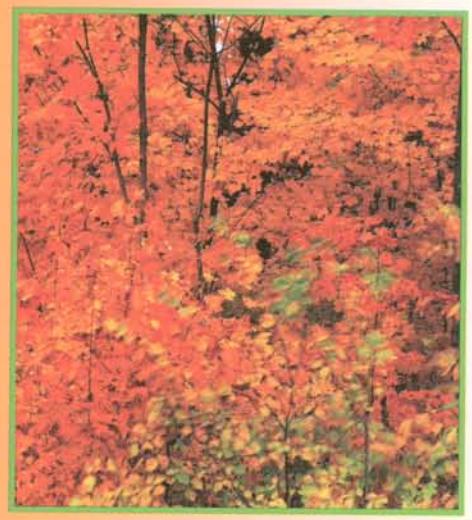
PLANNING FOR SPRING

October and November are the perfect time to start planning for the upcoming spring season. This includes planting drought-tolerant bulbs such as crocus, iris, and tulips.

If you are planning a Xeriscape garden, log on to the DWP web site to access extensive plant lists, landscaping guides, and links to water-wise gardening. If you have turf and want to replace it with beautiful Xeriscape or Native plants, hardscape, or other alternatives, please contact the DWP to learn about our turf buy-back program. Start planning your water-wise garden now!

www.bbldwp.com

FALL & WINTER GUIDE



Fall Colors

Department of Water and Power
City of Big Bear Lake
41972 Garstin Drive
Big Bear Lake, CA 92315
909-866-5050

ORDINANCE NO. 2005-348

AN ORDINANCE OF THE CITY OF BIG BEAR LAKE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AMENDING CHAPTER 15.66 OF ARTICLE XV OF THE BIG BEAR LAKE MUNICIPAL CODE DEALING WITH THE REGULATION OF LANDSCAPING

WHEREAS, the Department of Water and Power of the City of Big Bear Lake (the "Department") has undertaken to supply existing customers with water including, most importantly, water for human consumption, sanitation, and fire protection; and

WHEREAS, the total water supply available to the Department Service Area is dependent upon local rainfall and snow melt percolation into local ground water sources, which are limited; and

WHEREAS, recent periods of insufficient natural ground water recharge in the Big Bear Valley make it necessary for the Department to implement water conservation measures; and

WHEREAS, water usage and demand by Department customers has substantially increased over the past ten years, especially as a result of landscaping; and

WHEREAS, the estimate of perennial yield of the aquifers, water usage by customers, and anticipated growth of the community indicate that water demand may exceed supply within the next ten years; and

WHEREAS, the City Council of the City of Big Bear Lake ("City") desires to maintain the Department's water resources for human consumption, sanitation, and fire protection and reduce wasteful and inefficient consumption of water; and

WHEREAS, the City Council of the City of Big Bear Lake finds inefficient landscaping practices disproportionately drains the water resources of the Department; and

WHEREAS, the City Council of the City of Big Bear Lake finds that Chapter 15.66 must be amended to adequately address inefficient landscaping practices; and

WHEREAS, pursuant to Article XI, Section 7 of the California Constitution, the City is authorized to make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with the general laws of the State.

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF BIG BEAR LAKE DOES ORDAIN AS FOLLOWS:

SECTION 1. Chapter 15.66 of Article XV of the City of Big Bear Lake Municipal Code is hereby amended in its entirety to read as follows:

Chapter 15.66

LANDSCAPING REGULATIONS

Sections:

15.66.010	Purpose.
15.66.020	Application; Exception.
15.66.030	Goals and Objectives.
15.66.040	Definitions.
15.66.050	Water-Use Policies and Requirements.
15.66.060	Nonessential Water Use.
15.66.070	Turf Installations.
15.66.080	Water Feature Installation.
15.66.090	Landscape Plans and Permits.
15.66.100	New Landscape Regulations.
15.66.110	Regulations for Retrofitting Landscapes.
15.66.120	Regulations for Planning and Installation of Irrigation Systems.
15.66.130	Guidelines for Controlling Erosion.
15.66.140	Instructions for Submitting Landscape Plans.
15.66.150	Failure to Comply.
15.66.160	Removal of the Flow Restrictor.
15.66.170	Appeal Process.
15.66.180	Permit Fees.
15.66.190	Deposit of Penalty Monies.
15.66.200	Severability.

Section 15.66.010 Purpose. The purpose of this chapter is to set forth and require all new, retrofitted, or modified landscaping to adhere to landscaping practices guided by the latest low water use technology that emphasizes water-use efficiency to maximize the benefit of existing water supplies for the citizens of, visitors to, and the economic well-being of the Big Bear Valley. These measures will significantly reduce wasteful and inefficient consumption of water, and thus make these water resources available for human consumption, sanitation, and fire protection.

Section 15.66.020 Application; Exception. The provisions of this chapter shall apply to all customers of the Department, including customers who may also take ground water from private wells not owned or operated by the Department. Some or all of the guidelines and prohibitions contained in this chapter may not apply to specific, publicly owned properties such as schools and parks, which will be evaluated on a case-by-case basis.

Section 15.66.030 Goals and Objectives. Due to the increasing demand for water by Department customers for landscaping, and the finite nature of the Big Bear Valley's water resources, the general welfare of the community is best served by using the available water supply efficiently for maximum beneficial uses. Wasteful, inefficient, and unreasonable uses of water must be prevented.

Therefore, the Department hereby declares and establishes the following goals and objectives pertaining to the use of water provided by Department for landscaping.

A. Goals.

1. Efficient use and distribution of water used for landscaping and irrigation.
2. Conservation of limited water resources.
3. Use of appropriate planning to eliminate all wasteful and inefficient uses of water from all landscape plans during the planning stage.
4. Provide reasonable and appropriate size and water-use limitations for all landscape features.

B. Objectives.

1. To conserve the available water supply.
2. To achieve an overall, per capita reduction in water use.
3. To eliminate inefficient irrigation.
4. To reduce the volume of water waste.
5. To ensure an adequate supply of water to meet the reasonable needs of all users of Department water.
6. To increase the use and installation of water-conserving plants, landscapes, mountainscapes, and Xeriscapes.
7. To require all new developments and encourage existing developments to install low water-use landscape elements and erosion control devices.

Section 15.66.040 Definitions. The following words and phrases, whenever used in this chapter, shall be construed as defined in this section, unless otherwise specified within individual sections of this chapter.

"Aquifer" means a permeable geologic unit that can transmit significant quantities of water under ordinary hydraulic gradients.

"Board" means the Department's Board of Commissioners.

"CCF" means 100 cubic feet which equals 748 gallons.

"Customer" (City and County) means all persons, residences, businesses, and entities who receive and/or use water provided by the Department within the City or County.

"Department" means the City of Big Bear Lake Department of Water and Power.

"Drought" means a series of years where precipitation is below average.

"Emitter" means any irrigation nozzle that is used to distribute water to landscape vegetation.

"Environmental sensing device" means any device that uses or recognizes weather or soil moisture to modify irrigation schedules. Typical examples of an environmental sensing device include evapotranspiration irrigation controllers, soil moisture sensors, and rainfall shut-off devices.

"Erosion" means the process of moving soil by any agent of weather, typically the result of rainfall runoff.

"Erosion control" means anything that inhibits erosion.

"Essential water use" means water necessary for human consumption, sanitation, and fire protection. All other use of water, not specifically required to meet these needs, shall be considered nonessential.

"Existing developments" means any development for which certificates of occupancy have been granted.

"Finite" means limited in quantity.

"Fire protection" means water needed to protect humans and their property from an active fire.

"Ground water" means any water derived from springs or wells.

"Hardscape" means a landscape feature that contains no vegetation. Examples of a Hardscape include walkways, decks, graveled areas, and areas covered with mulches.

"His" is a collective term independent of gender and may refer to male or female.

"Human consumption" means water directly consumed by humans and their pets or livestock.

"Inefficient" means using water in a quantity in excess of the amount required, as determined by the Department, to accomplish a given task.

"Inefficient irrigation" means the process of providing more water to landscape plants or elements than is required for healthy, normal growth and appearance.

"Irrigation" means the process of providing supplemental water supplied by the Department to landscape plants and elements.

"Landscape" means the entire parcel less the building footprint, driveways, non-irrigated portions of parking lots, hardscapes, and other non-porous areas.

"Landscape element" means any and all unique features of a landscape.

"Landscaping" means the process of adding or subtracting vegetation or non-vegetative materials or their support structures (e.g. irrigation systems, walkways, retaining walls) to a landscape.

"Maximize the benefit" means to obtain the greatest feasible benefit.

"Mountainscape" means any low water-use landscape that is compatible with the climate of the Big Bear Valley.

"New developments" means developments that are under construction or will be constructed in the near future, and for which certificates of occupancy have not been granted.

"Percolation" means movement of water, by the forces of gravity, through soils and bedrock to a point of greater depth than its previous location.

"Perennial yield" means the maximum quantity of water available on an annual basis for the foreseeable future. This quantity depends on the amount of water economically, legally, and politically available to the organization(s) managing the ground water basin.

"Rain shut-off sensor" means any mechanism that detects precipitation and transmits the information to an irrigation controller.

"Recharge" means the process of adding water to an aquifer.

"Retrofit" means any change to any existing element.

"Sanitation" means cleanliness or the disposal of unhealthful waste.

"Turf" means a surface layer of earth containing grass with its roots.

"Wasteful" means using water in a quantity in excess of the amount needed to accomplish a given task.

"Water conservation plan" means a plan developed for any property that provides recommendations for conserving water based on how the home or business occupying the property used water in the past.

"Water conservation" means practices or activities which result in the use of water efficiently and in quantities considered less than average.

"Water features" means any landscape feature that utilizes standing or moving water as a main component. Standard examples are ponds, streams, and fountains.

"Water loss" means the loss of water caused by evaporation.

"Water resources" means the retrievable and usable supply of water.

"Water usage" means the act of using water provided by the Department's water system.

"Water-use efficiency" means the use of water in a way that minimizes waste (i.e. use beyond which is needed to accomplish a task).

"Winterize" means turning off water service and draining the on-site pipes or plumbing to prevent damage to the system during the winter months due to freezing.

"Xeriscape" means a landscape that requires relatively little water to install and maintain. Qualifying landscapes include those that range from highly vegetated to completely lacking in vegetation.

Section 15.66.050 Water-Use Policies and Requirements.

A. Customers shall be encouraged to use native and water-conserving plants for landscaping.

B. Customers shall be required to minimize the use of turf at all new and retrofitted commercial and residential landscapes.

C. Water conservation, emphasizing water use efficiency, will be required as set forth herein.

D. The Department shall require and promote development of water conservation plans for all customers whose water use exceeds reasonable guidelines developed by the Department.

E. The Department shall require repair of all leaks, once they are detected.

F. All outdoor irrigation systems shall be shut off and winterized between November 1st and April 1st annually.

G. The Department will establish reasonable water use and irrigation standards for all residential and commercial customers in its service area.

Section 15.66.060 Nonessential water use. Nonessential water use means water use in violation of Big Bear Lake Municipal Code section 17.11.040. The list of prohibited acts contained in section 17.11.040 is not exhaustive and may include other actions not listed therein.

Section 15.66.070 Turf installation.

A. Turf installations shall not exceed 500 square feet in size for each property.

B. All new and retrofitted landscapes with turf must be irrigated using a sprinkler system with an automatic irrigation controller, that incorporates evapotranspiration and rain shut-off features and has the capability to accommodate all time and date irrigation restrictions employed by the Department.

C. Prior to installing turf, the soil must be prepared to a minimum depth of six (6) inches by adding topsoil and soil conditioners to enhance the water retention capability of the soil.

D. The design of the turf area must be developed to allow efficient irrigation and prevent overspray and runoff.

E. A master valve must be installed on all new or retrofitted landscapes containing turf.

Section 15.66.080 Water Feature Installation.

A. Water feature installations shall not exceed an aggregate of 500 square feet of total surface area of customer's property.

B. When a water feature moves water, such a water feature must utilize a recirculating pump.

Section 15.66.090 Landscape Plans and Permits.

A. New Installations. Landscape plans must be submitted for review and permitting by a Department representative whenever the proposed landscape exceeds 1,000 square feet or when any turf is proposed to be installed. The landscape plan review and approval process will have no impact in granting a certificate of occupancy.

B. Retrofitting or Altering Existing Landscape. Landscape plans must be submitted for review and permitting by a Department representative whenever the combination of existing landscape and the proposed additional or retrofitted landscape exceeds 1,000 square feet.

C. Plan Review and Permitting. All landscape plans must be submitted to the Department for review and approval at least ten (10) days prior to the start of installation. A landscaping permit will be issued upon approval of the landscape plan.

Section 15.66.100 New Landscape Regulations.

A. Turf installations shall not exceed 500 square feet in size for each property.

B. Landscape plants must be grouped by similar irrigation requirements, and irrigation systems must be set up to irrigate individual water-use zones in accordance with their individual needs.

C. All slope and soil conditions, that may cause excessive runoff, must be identified and clearly resolved during the planning and installation process.

D. Landscape elements must be appropriately maintained to maximize water-use efficiency.

1. All sprinkler, emitter, pipe and pond leaks must be repaired timely, and all irrigation systems must be tested and inspected before regular use each spring.

2. All irrigation systems must be shut off and winterized between November 1st and April 1st annually.

Section 15.66.110 Regulations for Retrofitting Landscapes.

A. On landscapes that do not contain existing turf, new turf must be installed in accordance with section 15.66.070.

B If total turf area of a landscape exceeds 500 square feet, a property owner or customer is prohibited from expanding his turf area. If total turf area of a landscape is less than 500 square feet, a property owner or customer may expand his turf area provided that the total turf area does not exceed 500 square feet.

C. If a landscape contains more than 700 square feet of turf, turf may be rearranged as long as the net area of turf is reduced by at least twenty-five percent (25%).

D. Existing irrigation systems may be used as long as they can be employed to maximize irrigation efficiency on the retrofitted landscape. If existing irrigation systems cannot maximize irrigation efficiency, a new irrigation system must be installed.

E. Landscape plants must be grouped by similar irrigation requirements, and irrigation systems must be set up to irrigate individual water-use zones in accordance with their individual needs.

F. All slope and soil problems that may cause excessive runoff must be identified and clearly resolved during the planning and retrofitting process.

G. Landscape elements must be appropriately maintained to maximize water-use efficiency.

1. All sprinkler, emitter, pipe and pond leaks must be repaired timely, and all irrigation systems must be tested and inspected before regular use each spring.

2. All irrigation systems must be shut off and winterized between November 1st and April 1st annually.

15.66.120 Regulations for Planning and Installation of Irrigation Systems

A. Automatic irrigation control systems, that have the ability to accommodate all time and date irrigation restrictions employed by the Department, are required on all landscapes greater than 1,000 square feet in size.

B. Sprinklers will only be allowed on turf and other groundcovers. All other landscape plantings must be irrigated with efficient, low water-use devices, such as, drip systems or bubblers.

C. Sprinklers shall not be used on planter strips less than ten (10) feet wide, unless it can be demonstrated to the satisfaction of the Department that irrigation equipment will provide efficient irrigation and prevent overspray.

D. All irrigation controllers must be equipped with rain shut-off sensors.

E. A master valve must be installed on all new or retrofitted landscapes containing turf.

15.66.130 Guidelines for Controlling Erosion

A. All landscape plans for new and retrofitted landscapes must identify potential erosion problems.

B. Preventing erosion.

1. All slopes and areas of bare soil must be evaluated for their erosion potential.

2. All areas that are susceptible to erosion must be addressed with an erosion prevention plan as required by the Department.

3. Areas that contain running water from adjoining properties during rain showers or snow melt must be prepared to minimize erosion caused by this type of runoff utilizing dry stream beds, erosion resistant vegetation, or other methods required by the Department.

15.66.140 Instructions for Submitting Landscape Plans. Landscape plans shall be submitted with the permit application required by this chapter and shall contain the following information:

A. If a new or retrofitted landscape exceeds 3,000 square feet, the property owner or customer shall submit the following to the Department:

1. Appropriate addresses and contact information for the property owner and landscape contractor.

2. The proposed landscape design.

3. The existing landscape design, if the landscape is being retrofitted.

4. Identification of low, medium, and high water-use vegetation zones.

5. Plant lists associated with each water-use vegetation zone.

6. The proposed irrigation system design, including the location, type, size and description of landscaping to be installed (including all trees, shrubs, groundcover and turf /grass areas).

7. The existing irrigation system design, if the landscape is being retrofitted, including the location, type, approximate size, and description of landscaping (including all trees, shrubs, groundcover and turf /grass areas).

8. Identification of areas with slope or soil problems that need special irrigation features to effectively irrigate these areas.

9. A detailed description of solutions to irrigation problems identified in section 15.66.150(a)(8).

10. Identification and description of erosion control features.

11. Proposed irrigation schedules for all landscape features.

12. A list of environmental sensing devices associated with irrigation controllers, such as, evapotranspiration controllers, soil moisture sensors, and rainfall shut-off devices.

13. A detailed description of all water features.

14. An estimate of water use per month (in ccfs) for all landscape features, including water loss associated with water features.

15. A maintenance schedule for all landscape features.

16. A north arrow and scale.

17. Clearly legible and identifiable property lines and their dimensions.

18. The date of submittal of the plans and any revision dates.

19. A written narrative highlighting water-conserving features of the proposed landscape and its adherence to Xeriscape principles.

B. If the new or retrofitted landscape is less than 3,000 square feet and greater than 1,000 square feet, the property owner or customer shall submit the following to the Department:

1. Appropriate addresses and contact information for the property owner or customer and landscape contractor.

2. The proposed landscape design including the location, type, approximate size, and description of landscaping (including all trees, shrubs, groundcover and turf /grass areas).

3. If a landscape is being retrofitted, a written summary of the proposed changes and a list of the water-conserving features of the new landscape is required.

4. An estimate of water use per month (in ccfs) for all landscape features, including water loss associated with water features.

5. All landscape plans shall clearly show xeriscape principles are being implemented.

15.66.150 Failure to Comply. The penalties for failure to comply with any provisions of this chapter shall be as follows:

A. First violation. The Department will contact the customer by certified mail explaining the violation, the need for the regulation that was violated, a list of penalties associated with continued violation, and request voluntary compliance.

B. Second violation. The Department will contact the customer by certified mail explaining the violation, the need for the regulation that was violated, inform the customer of his previous violations, provide a list of penalties associated with continued violation, and add a surcharge to the customer's water bill which is twice the customer's charge for water usage for the billing cycle during which the violation occurred. If the customer does not cure the violation within 10 days of the date of the notification letter from the Department, the Department will deem the failure to cure as a new violation.

C. Third violation. The Department will contact the customer by certified mail explaining the violation, the need for the regulation that was violated, inform the customer of his previous violations, provide a list of penalties associated with continued violation, add a surcharge to the customer's water bill which is triple the customer's charge for water usage for the billing cycle during which the violation occurred, and notify the Board. If the customer does not cure the violation within 10 days of the date of the notification letter from the Department, the Department will deem the failure to cure as a new violation.

D. Fourth violation. The Department will contact the customer by certified mail explaining the violation, the need for the regulation that was violated, inform the customer of his previous violations, provide a list of penalties associated with continued violation, install a flow restrictor in the customer's water service, add

a surcharge to the customer's bill which is quadruple the customer's charge for water usage for the billing cycle during which the violation occurred, together with all associated expenses dealing with the flow restrictor, and notify the Board. If the customer does not cure the violation within 10 days of the date of the notification letter from the Department, the Department will deem the failure to cure as a new violation.

E. Fifth violation. The Department will contact the violator by certified mail explaining the violation, the need for the regulation that was violated, inform the customer of his previous violations, and, upon approval of the Board, discontinue water service to the customer until the customer delivers a notarized written agreement to abide by all water use regulations established by Department and such other requirements as the Board may determine to be appropriate under the circumstances.

15.66.160 Removal of the Flow Restrictor. The water restrictor will be removed, or water service will be restored, whichever the case may be, upon a hearing as provided in Section 15.66.180 where the customer demonstrates to the satisfaction of the General Manager that the cause of the violation has been corrected and all fees and surcharges have been paid.

15.66.170 Appeal Process. A customer shall have the right to a hearing before the General Manager if the Department receives a written request for such a hearing on or before twenty-one (21) days after the date the notice is mailed to the customer.

The written request for a hearing shall include a statement setting forth reasons why the customer believes that a violation of this chapter has not occurred, along with any documentation that may substantiate the customer's position.

The customer's written request for a hearing shall include payment of the surcharge. Said payment shall be held on deposit with the Department. If, following the hearing, it is determined the surcharge will not be imposed, the Department will refund said deposit.

Upon receipt of a request for a hearing, the General Manager shall contact the customer regarding proposed dates for the hearing. The hearing shall be conducted at the Department's offices. The date of the hearing shall be set at a time that is mutually convenient to both parties, but in any event, shall be held no later than fifteen (15) days from the date of customer's request.

The hearing shall be informal and shall not require adherence to any particular procedure. The General Manager shall render a written decision on or before five (5) days following the date of the hearing.

The customer shall only have a right to appeal alleged violations of the procedures of this chapter by the General Manager or his staff to the Board if the Board receives a written request for such an appeal hearing on or before fifteen (15) days after the date of the General Manager's decision. For all other matters or issues, the decision of the General Manager is a final decision of the Department, and the applicant shall have no right of appeal.

The hearing before the Board shall be held at a regular Board meeting within thirty (30) days of the Department receiving the written request for a hearing. The decision of the Board shall be final.

15.66.180 Permit Fees. No fee shall be charged for the filing of an application or landscape plan under this chapter.

15.66.190 Deposit of Penalty Monies. All monies collected by the Department, pursuant to any of the surcharge provisions of this chapter, shall be deposited in the Water Revenue Fund as reimbursement for the Department's costs and expenses of administering and enforcing this chapter and its general Water Conservation Program.

15.66.200 Severability. If any provision of these Regulations is found to be illegal, unconstitutional, or unenforceable for any reason whatsoever, that provision shall be severed from the remaining provisions, which shall remain in full force and effect.

SECTION 2. This Ordinance shall take effect and shall be published in accordance with applicable law.

PASSED, APPROVED AND ADOPTED this 14th day of March, 2005.

AYES:	Conklin, Dally, Harris, Jahn, Mulvihill
NOES:	None
ABSENT:	None
ABSTAIN:	None

March 14, 2005
Date

Darrell Mulvihill
Darrell Mulvihill, Mayor

ATTEST:

Katherene E. Jefferies
Katherine E. Jefferies
City Clerk

REVIEWED AND APPROVED:

Stephen P. Deitsch
Best Best & Krieger LLP
City Attorney

Thomas Harder

Groundwater Consulting

May 1, 2009

Mr. Michael Perry
California Collaborative Solutions
P.O. Box 706
Big Bear City, California 92314

Re: Letter Addressing County of San Bernardino Comments Regarding Water Supply for the Moon Camp Development

Dear Michael,

As per your request, Thomas Harder Groundwater Consulting (THGC) has prepared this letter addressing comments from the County of San Bernardino (County) regarding water supply for the proposed Moon Camp Development near Fawnskin, California. The primary focus of the County's comments is a report by GEOSCIENCE Support Services, Inc. (GEOSCIENCE)[1] that describes the results of recent pumping tests conducted on the Moon Camp Tract's Well FP-2. However, the County's comments also discuss previous estimates of perennial yield for Tributary Subarea A and supplemental water to be supplied from the Moon Camp Tract's recently constructed Well FP-4.

This letter addresses the following specific issues raised by the County:

1. The range of perennial yield (including the low end or "minimum") that has previously been estimated for Subarea A, which is tributary to Well FP-2.
2. Potential impacts of pumping Well FP-2 on Big Bear Lake.
3. Potential impacts associated with the utilization of Well FP-4 as a supplemental water supply source for the development.

[1] GEOSCIENCE, 2008. Results of Rehabilitation and Aquifer Testing, Moon Camp Well FP-2. Prepared for California Collaborative Solutions; Dated August 7, 2008.

Perennial Yield Estimates

The majority of the proposed Moon Camp development is located within Tributary Subarea A of the North Shore Hydrologic Subunit within the Big Bear Lake Watershed. This subarea is the most westerly of the North Shore subareas and is adjacent to the Grout Creek Hydrologic Subunit (see Figure 1).

The perennial yield (i.e. groundwater available for municipal supply) for Subarea A has been estimated in the context of a range of possible natural recharge estimates for the area. GEOSCIENCE, 2003[2] estimated the natural recharge to range from 14 to 44 acre-ft/yr with a midpoint of 29 acre-ft/yr. They reported that the midpoint of the range (i.e. 29 acre-ft/yr) is considered a good estimate of the perennial yield for the subarea, based on available data.

Although recent testing has shown that the pumping capacity of Well FP-2 can easily meet and exceed the demands of the Moon Camp development, the well will be operated within the low end of the natural recharge estimate (14 acre-ft/yr) minus the estimated pumping of the existing homeowners in Subarea A (5 acre-ft/yr). This leaves 9 acre-ft/yr to be pumped from Well FP-2 for the Moon Camp Development. The low end of the range of natural recharge estimates for Subarea A (14 acre-ft/yr) is a conservative estimate of the perennial yield (i.e. available groundwater supply) for the subarea. This amount of recharge is only 2.5 percent of the long-term average annual precipitation for the subarea, which is approximately 28 in/yr based on the San Bernardino County Flood Control District isohyetal map for the area (see GEOSCIENCE, 2003; Figure 4). This amount of recharge is also below the range of accepted recharge estimates for other groundwater basins in southern California, which is generally 3 to 7 percent of precipitation (GEOSCIENCE, 2003). In some areas of southern California, groundwater recharge as a percent of precipitation has been reported to be greater than 10 percent (as an example, see Manghi, et al., 2009)[3]. Thus, until additional data can be collected to refine the perennial yield estimate of Subarea A, producing up to 14 acre-ft/yr of groundwater from this subarea for existing pumpers and the proposed Moon Camp development is a very conservative approach to developing the groundwater resources of the area.

[2] GEOSCIENCE, 2003. Focused Geohydrologic Evaluation of Maximum Perennial Yield for the North Shore and Grout Creek Hydrologic Subunits. Prepared for the City of Big Bear Lake Department of Water and Power. Dated December 2, 2003.

[3] Manghi, F., Mortazavi, B., Crother, C., and Hamdi, M., 2009. Estimating Regional Groundwater Recharge Using a Hydrological Budget Method. Springer Science and Business Media.

The data that has been collected since 2003, including the data from the FP-2 pumping test, is not adequate to refine the perennial yield estimate. One of the best ways to refine the current perennial yield estimate is to monitor groundwater pumping and groundwater level response within Subarea A over a long-term period. Long-term would be defined on the order of decades and would include monitoring and production over multiple "wet" and "dry" hydrologic cycles. Pumping Well FP-2 and other private wells in Subarea A at rates up to 14 acre-ft/yr is a prudent approach for developing the groundwater resources of the area and, in the context of a groundwater monitoring program, verifying the available perennial yield.

Potential Impacts of Pumping Well FP-2 on Big Bear Lake

The potential impact of pumping Well FP-2 on the surface water in Big Bear Lake would be minimal. Well FP-2 produces groundwater from an aquifer system that is deeper than the bottom of Big Bear Lake and is separated from the lake bottom by multiple silt and clay layers. The top of perforations for Well FP-2 occur approximately 60 ft below ground surface (bgs) at an elevation of approximately 6,686 ft above mean sea level (amsl). The high surface water elevation in the lake is 6,743 ft amsl and the average depth of the lake is 30 ft.[4] Thus, the elevation of the bottom of Big Bear Lake is approximately 27 ft above the top of perforations for Well FP-2. The geologic log for Well FP-2 shows multiple silt and clay layers between the land surface and top of perforations (see Attachment A). If the silt and clay layers extend beneath the lake, they would provide some hydraulic separation between the lake water and aquifer system. While it is possible that some vertical leakage could occur from the lake into the aquifer system of FP-2, the majority of groundwater produced by FP-2 would be from the aquifer underlying Subarea A.

Potential Impacts Associated with Pumping Well FP-4

Well FP-4 has recently been constructed in the northwestern corner of the proposed Moon Camp development to provide a supplemental source of water supply. This well is located within Subarea D of the Grout Creek Hydrologic Subunit, a separate drainage catchment from Tributary Subarea A of the North Shore Hydrologic Subunit (see Figure 1). A pumping test conducted upon completion of Well FP-4 indicates it is capable of producing up to 3.5 gallons per minute

[4] Big Bear Municipal Water District Website.

on a sustained basis. At this rate and assuming continuous operation, the well would produce approximately 5.6 acre-ft/yr.

GEOSCIENCE, 2003 reports the groundwater recharge for Subarea D to be between 32 and 99 acre-ft/yr with a midpoint of 66 acre-ft/yr. At present, the only groundwater production in this subarea is from private wells. There are eleven private wells shown on Figure 4 of GEOSCIENCE, 2003. Assuming an average per-household water demand of 250 gallons per day, annual groundwater production from private wells in Subarea D is estimated to be approximately 3 acre-ft/yr. Based on this, the additional 5.6 acre-ft/yr of pumping anticipated from Well FP-4 will not result in combined pumping in excess of the low end of recharge estimates (32 acre-ft/yr) for the Subarea and is not a significant impact to the long-term water supply of Subarea D.

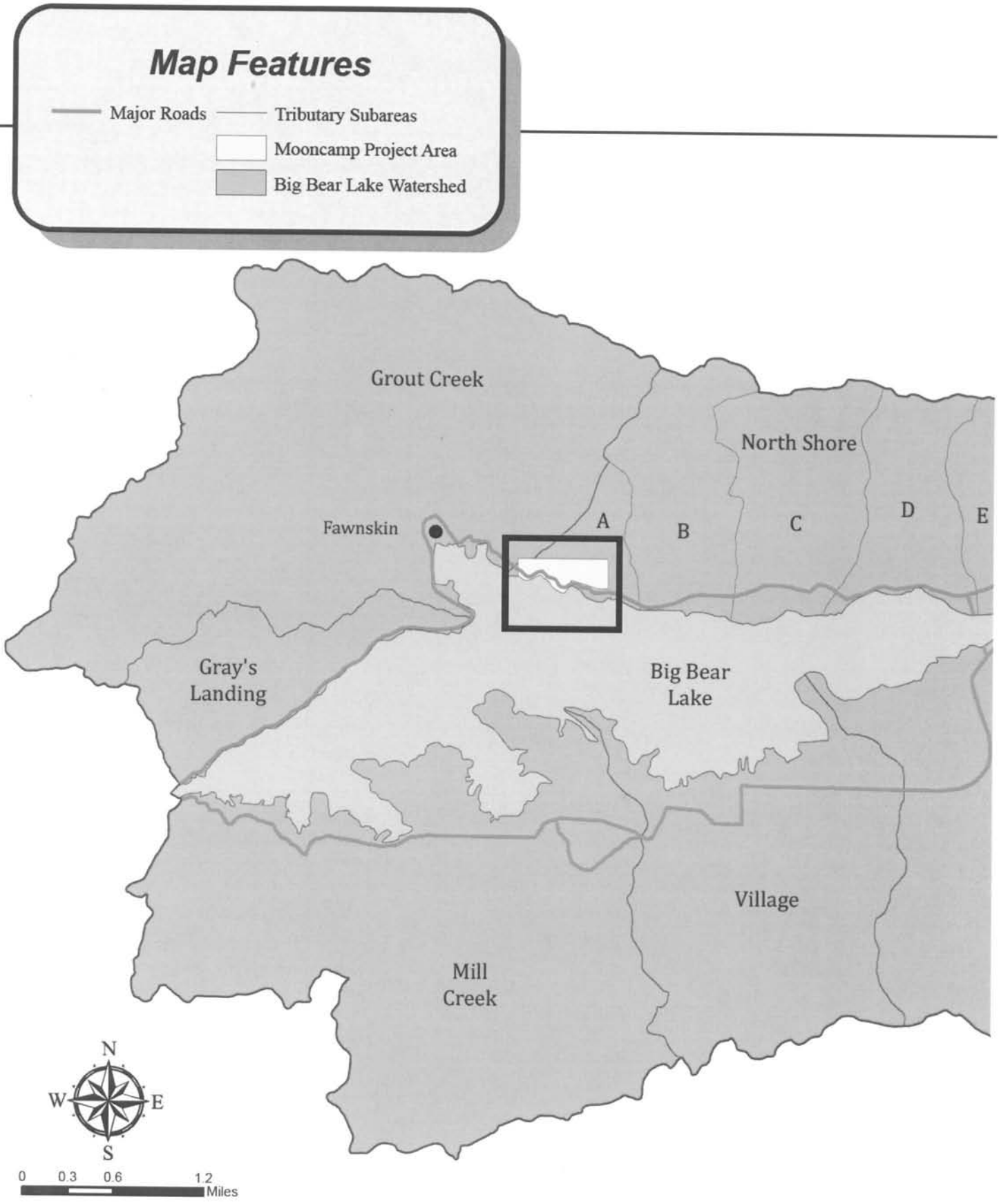
The only other potential impact of pumping Well FP-4 is interference with existing private wells. Pumping test data for Well FP-4 shows that pumping this well at a sustained rate of 3.5 gpm results in approximately 2 ft of drawdown in the nearest private well, which is approximately 250 ft from FP-4. The limited available data for the private well suggests that this well has available saturated thickness to accommodate the additional 2 ft of drawdown and pumping interference from Well FP-4 should not significantly impact the operation of the well.

I appreciate the opportunity to assist in responding to the County's comments regarding the Moon Camp Development. If you have any questions, please call.

Sincerely,

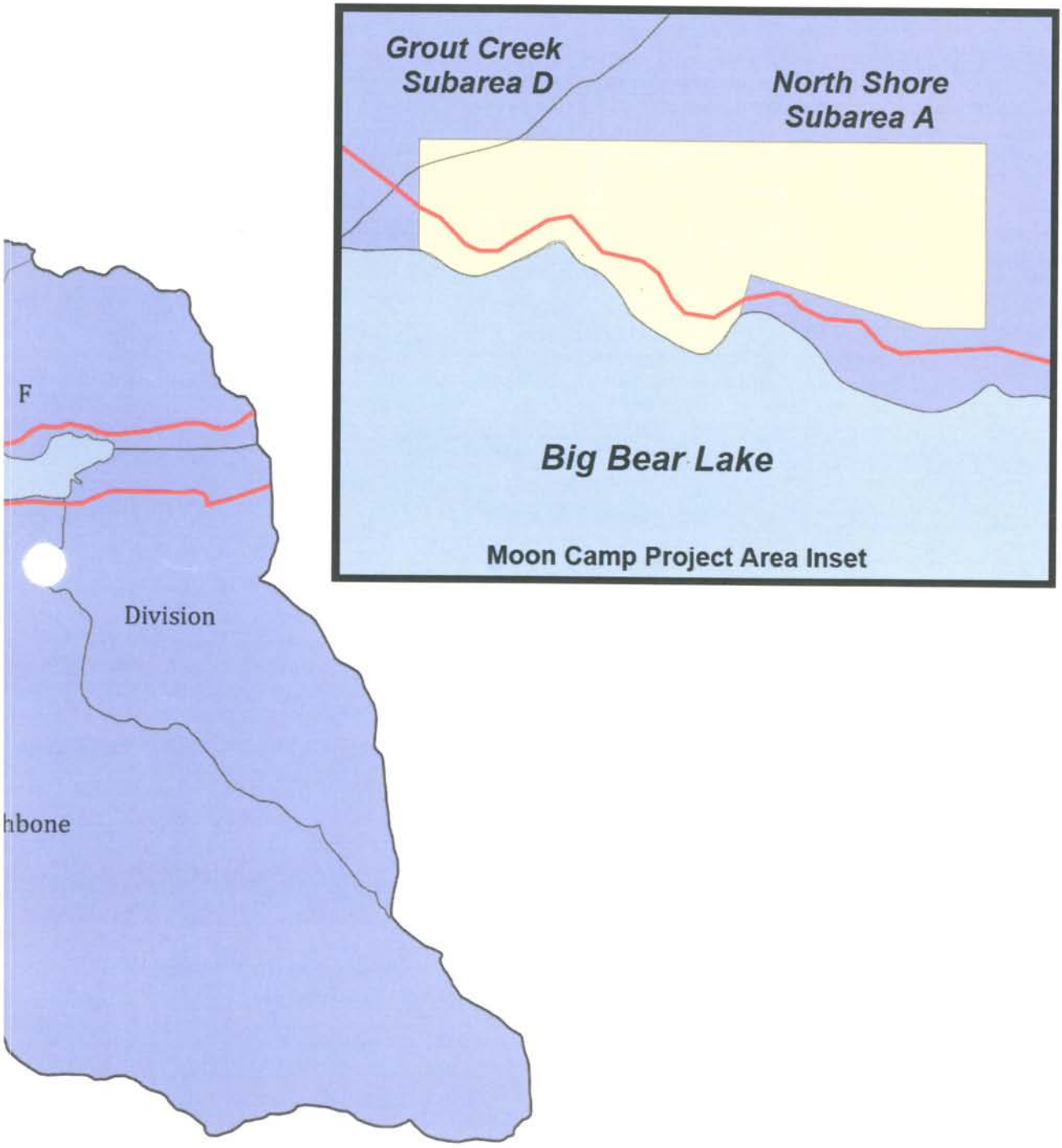
Thomas Harder

Thomas Harder, P.G., C.HG.
Hydrogeologist



NAD 83 UTM Zone 11
Central Meridian: -117

Thomas Harder
Ground Water Consulting



Moon Camp Project Location and Hydrologic Features

Figure 1

Attachment A

Well FP-2 Borehole Log

LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log		Description of Materials
		SOIL	Brown sandy silt with some gravel, roots
		GRAVEL & SAND	Multicolored, very fine to coarse sand and granule to cobble size gravel
10		SAND	Reddish brown, fine to coarse sand with some clay and fine gravel
20			Clayier
30		SILT	Brown clayey silt with some fine sand
		SAND	Multicolored silty sand with occasional fine to coarse gravel
		CLAY	Brown sandy clay with some silt and medium to coarse sand
40		SAND	Brown clayey sand with some gravel
		CLAY	Brown, medium to coarse sandy clay
50		SAND	Multicolored with a few fine gravels, medium to coarse loose sand
		CLAY	Brown sandy clay with considerable silt
60		SAND	Brown clayey sand with a few fine gravels, medium to coarse sand
		CLAY & SAND	Brown clay with local thin medium to coarse sand layers
70			Siltier

LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log		Description of Materials
			Clayier
90			
		SAND	Brown clayey sand with some silt, occasional fine gravel, fine to coarse sand
100			
			Clays decrease
			Clay
110			
			Gravel lens
120			
		CLAY	Brown silty clay with some sand
130		SAND	Brown clayey sand with some fine gravel, very fine to medium sand
140		CLAY & SAND	Brown clay and sand interbedded, occasional fine gravel, very fine to coarse sand
			Siltier
150			

LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log		Description of Materials
		SAND	Brown clayey, very fine to fine sand with some silt and local fine gravel lens
170			
		CLAY	Reddish brown sandy clay with local sand lenses with occasional fine gravels
180			
190			
200			
210			
		SAND	Brown clayey very fine to medium sand, with some silts
220			
230			
		CLAY	Reddish brown sandy clay with occasional fine gravel and very fine to medium sand
240			

LITHLOGIC LOG

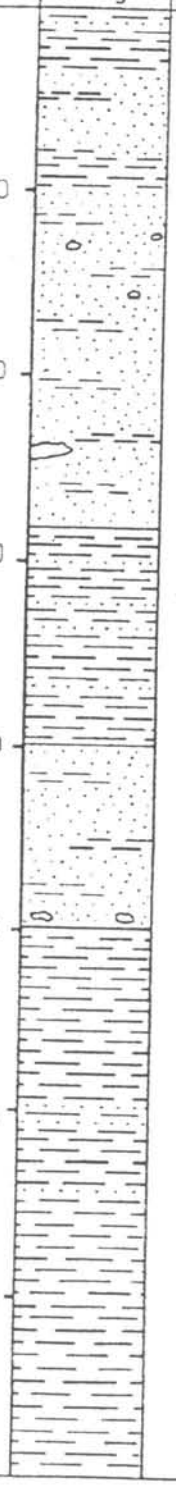
Well No. FP-2

Depth	Graphic Log		Description of Materials
			Interbedded thin sand layers
250			
		SAND	Brown, clayey, fine to coarse sand with some fine gravel
260			
270			Clayier
280		CLAY	Reddish brown sandy clay with local thin beds of fine sand
290			
300			
310		SAND	Brown clayey medium to coarse sand with a few fine gravels

LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log		Description of Materials
			Clayier
330			
340			White clays
350		CLAY	Reddish brown sandy clay with some silts and very fine to medium sand
360		SAND	Multicolored clayey very fine to coarse sand
370			Gravelly
		CLAY	Reddish brown, medium to coarse sandy clay
380			
390			



LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log	Description of Materials
410		

California
Collaborative
Solutions

909 586-5819
P.O. Box 706
Big Bear City, CA 92314
calcolsol@gmail.com

April 24, 2009

Joel Dickson
General Manager
Big Bear Lake DWP
P.O. Box 1929
Big Bear Lake, CA 92315

Re: Moon Camp Tract

Joel,

I am working to complete our Draft EIR for the Moon Camp Project. We anticipate having it ready for the 45 day Public Review Period in late May, early June.

As a part of the Draft EIR, we are showing 2 alternatives for the Water System (see attached Summary).

I am requesting the DWP's approval of Alternative #1 which includes connecting to the Fawnskin Water System as detailed in the DWP's Feasibility Study.

Please call me if you have any questions or need any additional information.

Thank you for your consideration.

Sincerely,

Michael Perry
California Collaborative Solutions

Moon Camp Water Service

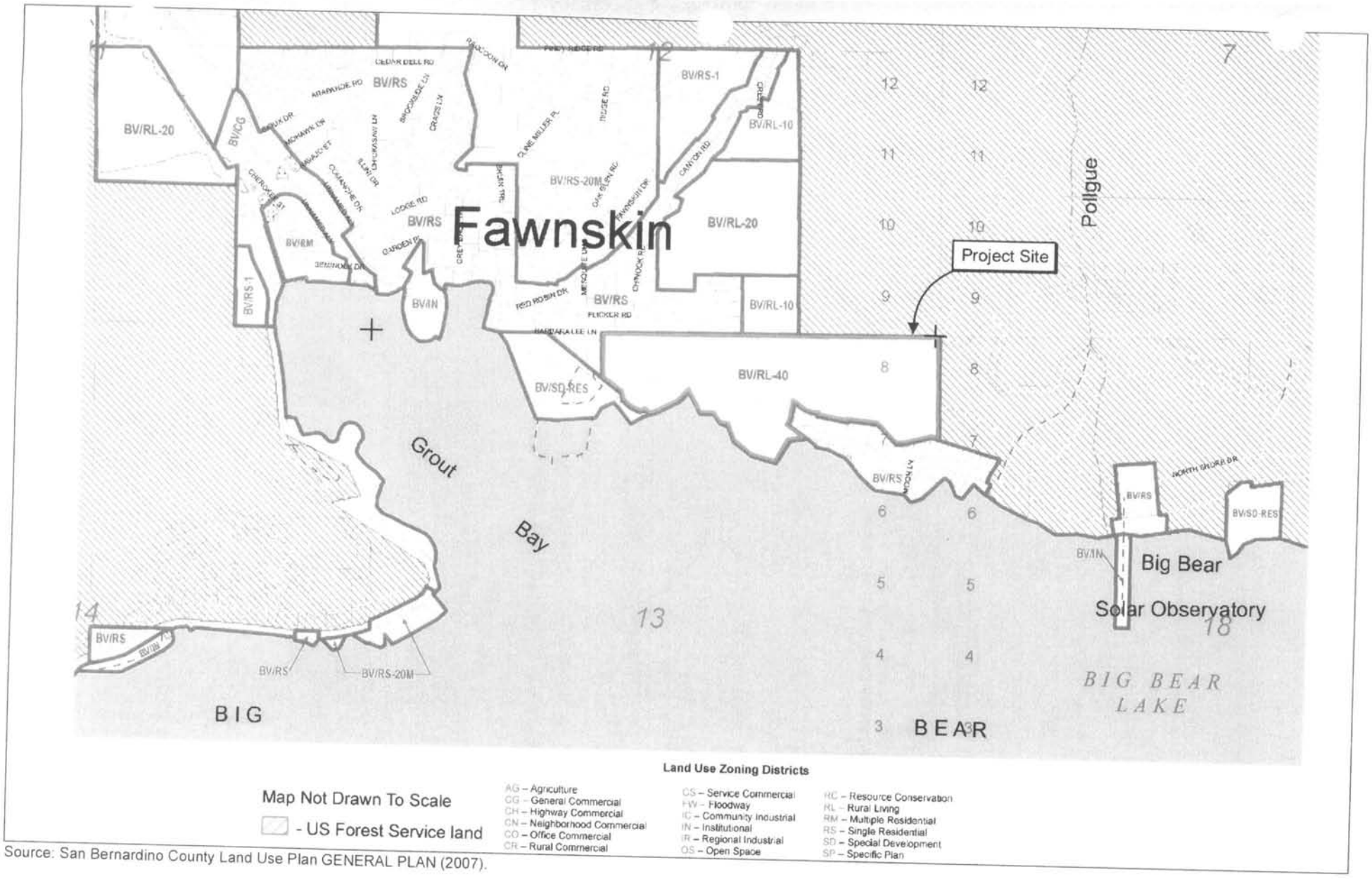
Water Supply:

- 50 each, ½ - 3 acre lots, individual lot sales, custom built homes (previously 92 lots)
- 50 lots require 14 acre-feet per year (Alda Feasibility Study/La Haye-DWP)
- Well FP2 provides 9 acre-feet from the North Shore Sub Area "A" Basin (Geoscience/Harder)
- Well FP4 provides 5 acre-feet from Grout Creek Basin (Geoscience/Harich/Harder)

Water Facilities:

- **Draft EIR Alternative #1** --- Interconnect Moon Camp Tract pipelines / wells with the existing DWP Fawnskin Water Facilities per Alda Feasibility Study. Moon Camp Tract facilities (onsite) owned and operated by CSA 53C (per LAFCo). Offsite facilities (Fawnskin Water System) owned and operated by DWP.
    - Racoon Reservoir provides domestic and fire flow storage (per Alda Feasibility Study)
    - Moon Camp refurbishes Clinemiller Booster (per Alda Feasibility Study)
    - Moon Camp provides 35 KW emergency generator (per Alda Feasibility Study)
    - Moon Camp replaces 2,800 feet of Phase 1, 12" DWP pipeline (per Alda Feasibility Study)
    - Moon Camp constructs 700 feet of 12" DWP pipeline (per Alda Feasibility Study)
    - Moon Camp Wells pump thru 12" line into DWP system – controlled by DWP telemetry
    - CSA 53C sells excess water from Wells FP2 and FP4 to DWP
    - In an emergency, if Wells FP2 and FP4 are unable to supply the needs of the Moon Camp Tract, DWP will sell water to CSA 53C
    - Reimbursement Agreement for Phase 1 replaced pipeline

- **Draft EIR Alternative #2** --- All water facilities are constructed onsite: 3 wells, reservoir, fire booster, pipelines. Owned and operated by CSA 53C (per LAFCo)



Source: San Bernardino County Land Use Plan GENERAL PLAN (2007).

NORTH

Michael Brandman Associates

00520089 • 10/2007 | 2-3_land_use_designations.mxd

Exhibit 2-3
Land Use Designations

SAN BERNARDINO COUNTY
MOON CAMP 50-LOT RESIDENTIAL SUBDIVISION

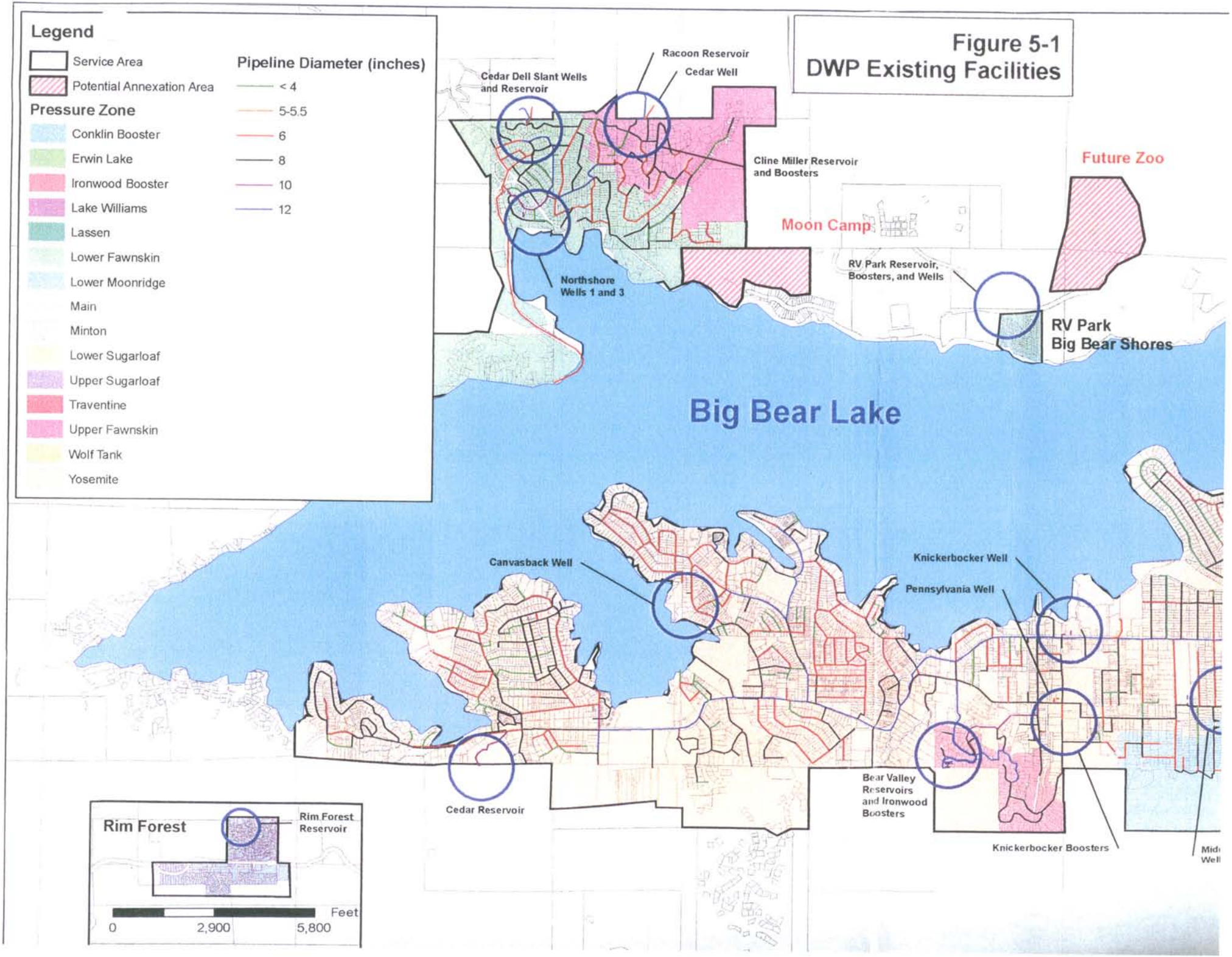


Figure 5-1
DWP Existing Facilities
Legend
Service Area
Potential Annexation Area
Pressure Zone
Conklin Booster
Erwin Lake
Ironwood Booster
Lake Williams
Lassen
Lower Fawnskin
Lower Moonridge
Main
Minton
Lower Sugarloaf
Upper Sugarloaf
Traventine
Upper Fawnskin
Wolf Tank
Yosemite
Pipeline Diameter (inches)
< 4
5-5.5
6
8
10
12
Racoon Reservoir
Cedar Well
Cedar Dell Slant Wells and Reservoir
Cline Miller Reservoir and Boosters
Future Zoo
Moon Camp
RV Park Reservoir, Boosters, and Wells
Northshore Wells 1 and 3
RV Park
Big Bear Shores
Big Bear Lake
Canvasback Well
Knickerbocker Well
Pennsylvania Well
Cedar Reservoir
Bear Valley Reservoirs and Ironwood Boosters
Knickerbocker Boosters
Rim Forest
Rim Forest Reservoir
Feet
0
2,900
5,800

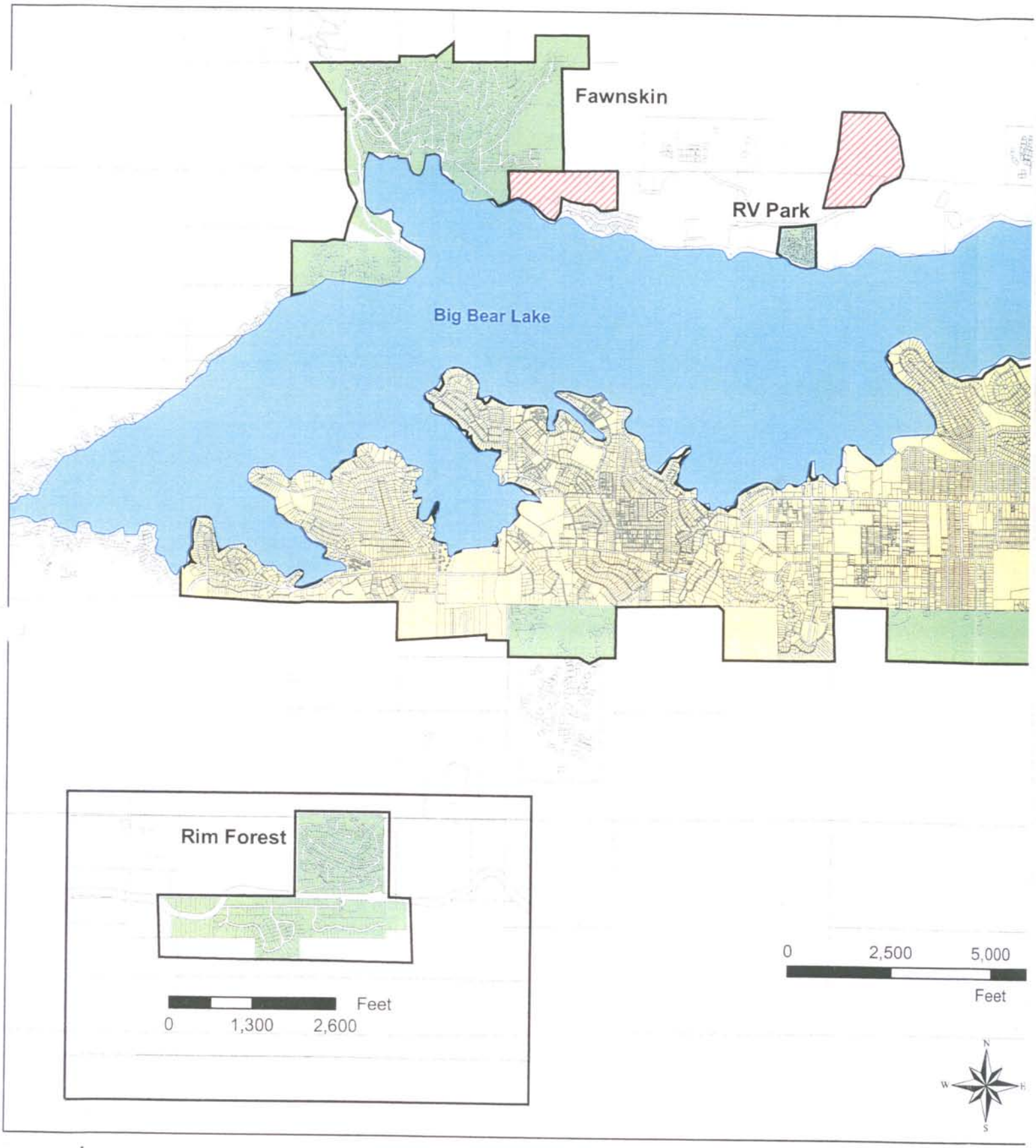
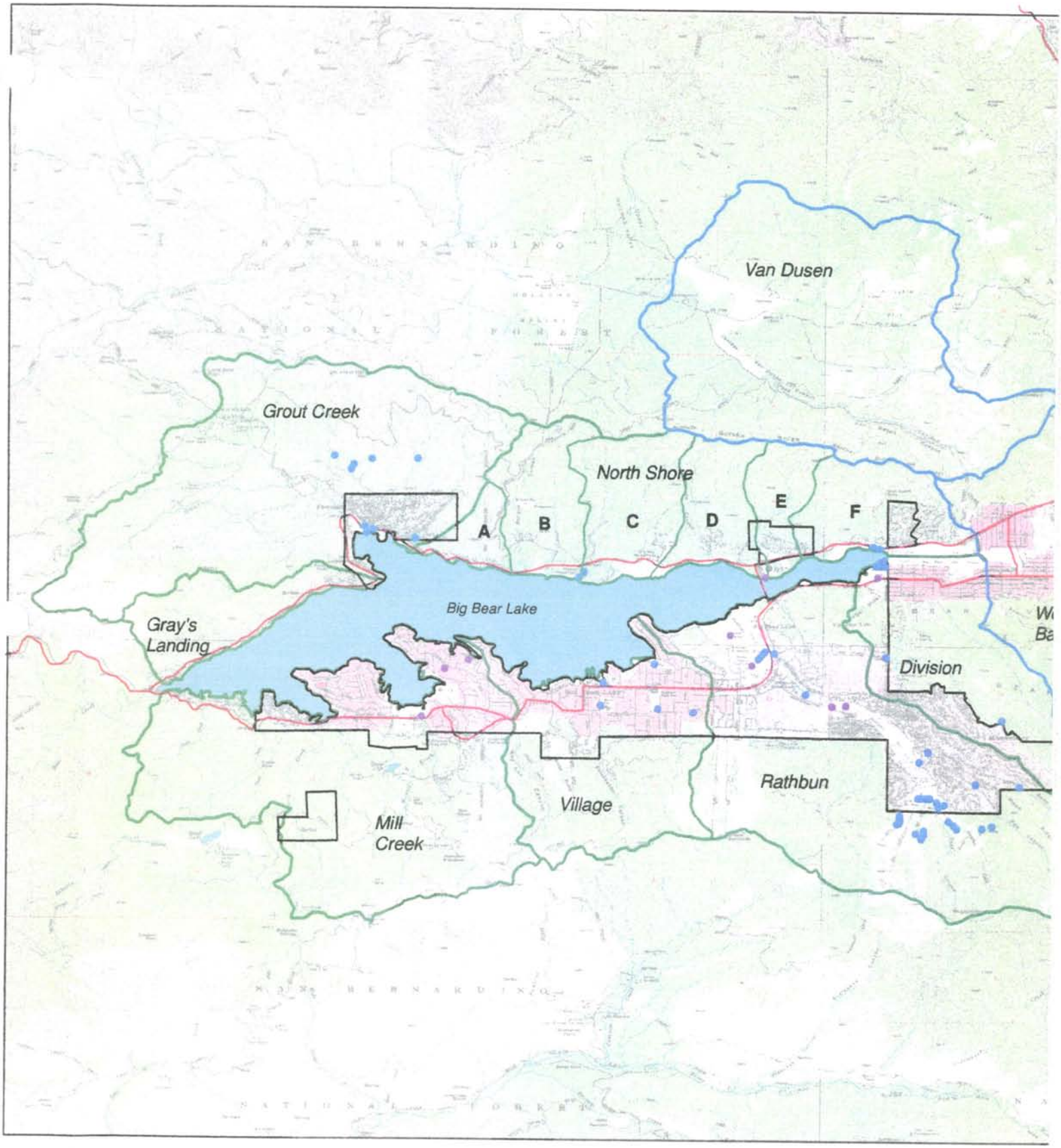


Figure 2-1
DWP Service Area



Sep-08

Figure 1

Big Bear DWP Service Area

Tributary Subarea

A

City of Big Bear Lake
Department of Water and Power

Appendix D:
Noise Data

D.1 - Noise Modeling Data (DKS, No Date)

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-BigBearEOStanfield Year 2030 Weekday

Location: Big Bear Blvd East of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	1864	183	63.7	59.1	54.6	50.1	45.6	41.0	36.5	32.0
Med Trucks	19	2	54.1	49.5	45.0	40.5	36.0	31.4	26.9	22.4
Hvy Trucks	19	2	57.4	52.8	48.3	43.8	39.3	34.8	30.3	25.7
TOTAL	1902	186	65.0	60.4	55.9	51.4	46.8	42.3	37.8	33.3
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	2981	292	65.8	61.1	56.6	52.1	47.6	43.1	38.6	34.1
Med Trucks	30	3	56.2	51.5	47.0	42.5	38.0	33.5	29.0	24.5
Hvy Trucks	30	3	59.5	54.9	50.4	45.8	41.3	36.8	32.3	27.8
TOTAL	3042	298	67.1	62.4	57.9	53.4	48.9	44.4	39.9	35.3
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	2989	293	65.8	61.2	56.6	52.1	47.6	43.1	38.6	34.1
Med Trucks	31	3	56.2	51.6	47.0	42.5	38.0	33.5	29.0	24.5
Hvy Trucks	31	3	59.5	54.9	50.4	45.8	41.3	36.8	32.3	27.8
TOTAL	3050	299	67.1	62.4	57.9	53.4	48.9	44.4	39.9	35.4
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	1125	110	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Med Trucks	11	1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Hvy Trucks	11	1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
TOTAL	1148	112	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
CHANGE FROM FUTURE NO PROJECT										
Autos	8	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	8	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-BigBearEOStanfieldSunday Year 2030 Sunday

Location: Big Bear Blvd East of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	1809	177	63.6	59.0	54.5	49.9	45.4	40.9	36.4	31.9
Med Trucks	18	2	54.0	49.4	44.9	40.3	35.8	31.3	26.8	22.3
Hvy Trucks	18	2	57.3	52.7	48.2	43.7	39.2	34.6	30.1	25.6
TOTAL	1846	181	64.9	60.3	55.7	51.2	46.7	42.2	37.7	33.2
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	2691	264	65.3	60.7	56.2	51.7	47.2	42.6	38.1	33.6
Med Trucks	27	3	55.7	51.1	46.6	42.1	37.6	33.0	28.5	24.0
Hvy Trucks	27	3	59.0	54.4	49.9	45.4	40.9	36.4	31.8	27.3
TOTAL	2746	269	66.6	62.0	57.5	53.0	48.4	43.9	39.4	34.9
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	2694	264	65.3	60.7	56.2	51.7	47.2	42.6	38.1	33.6
Med Trucks	27	3	55.7	51.1	46.6	42.1	37.6	33.0	28.5	24.0
Hvy Trucks	27	3	59.0	54.4	49.9	45.4	40.9	36.4	31.9	27.3
TOTAL	2749	269	66.6	62.0	57.5	53.0	48.4	43.9	39.4	34.9
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	885	87	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Med Trucks	9	1	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Hvy Trucks	9	1	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TOTAL	903	88	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
CHANGE FROM FUTURE NO PROJECT										
Autos	3	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	3	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-BigBearWOStanfield Year 2030 Weekday

Location: Big Bear Blvd West of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Traffic Volume Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	2521	247	65.0	60.4	55.9	51.4	46.9	42.4	37.8	33.3
Med Trucks	26	3	55.4	50.8	46.3	41.8	37.3	32.8	28.2	23.7
Hvy Trucks	26	3	58.8	54.1	49.6	45.1	40.6	36.1	31.6	27.0
TOTAL	2572	252	66.3	61.7	57.2	52.7	48.2	43.6	39.1	34.6
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	4191	410	67.2	62.6	58.1	53.6	49.1	44.6	40.0	35.5
Med Trucks	43	4	57.6	53.0	48.5	44.0	39.5	35.0	30.5	25.9
Hvy Trucks	43	4	61.0	56.3	51.8	47.3	42.8	38.3	33.8	29.3
TOTAL	4277	419	68.5	63.9	59.4	54.9	50.4	45.9	41.3	36.8
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	4807	471	67.8	63.2	58.7	54.2	49.7	45.2	40.6	36.1
Med Trucks	49	5	58.2	53.6	49.1	44.6	40.1	35.6	31.0	26.5
Hvy Trucks	49	5	61.6	56.9	52.4	47.9	43.4	38.9	34.4	29.8
TOTAL	4905	480	69.1	64.5	60.0	55.5	51.0	46.4	41.9	37.4
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	2286	224	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Med Trucks	23	2	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Hvy Trucks	23	2	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
TOTAL	2333	228	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
CHANGE FROM FUTURE NO PROJECT										
Autos	615	60	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Med Trucks	6	1	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Hvy Trucks	6	1	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
TOTAL	628	61	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-BigBearWOStanfieldSunday Year 2030 Sunday

Location: Big Bear Blvd West of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	2329	228	64.7	60.1	55.6	51.0	46.5	42.0	37.5	33.0
Med Trucks	24	2	55.1	50.5	46.0	41.4	36.9	32.4	27.9	23.4
Hvy Trucks	24	2	58.4	53.8	49.3	44.8	40.3	35.7	31.2	26.7
TOTAL	2377	233	66.0	61.4	56.8	52.3	47.8	43.3	38.8	34.3
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	3408	334	66.3	61.7	57.2	52.7	48.2	43.7	39.1	34.6
Med Trucks	35	3	56.8	52.1	47.6	43.1	38.6	34.1	29.6	25.0
Hvy Trucks	35	3	60.1	55.4	50.9	46.4	41.9	37.4	32.9	28.4
TOTAL	3478	341	67.6	63.0	58.5	54.0	49.5	45.0	40.4	35.9
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	3426	335	66.4	61.7	57.2	52.7	48.2	43.7	39.2	34.7
Med Trucks	35	3	56.8	52.2	47.6	43.1	38.6	34.1	29.6	25.1
Hvy Trucks	35	3	60.1	55.5	51.0	46.4	41.9	37.4	32.9	28.4
TOTAL	3496	342	67.7	63.0	58.5	54.0	49.5	45.0	40.5	35.9
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	1097	107	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Med Trucks	11	1	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Hvy Trucks	11	1	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TOTAL	1119	110	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
CHANGE FROM FUTURE NO PROJECT										
Autos	18	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	18	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-NorthShoreEOStanfield Year 2030 Weekday

Location: North Shore Drive East of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	643	63	59.1	54.5	50.0	45.5	40.9	36.4	31.9	27.4
Med Trucks	7	1	49.5	44.9	40.4	35.9	31.3	26.8	22.3	17.8
Hvy Trucks	7	1	52.8	48.2	43.7	39.2	34.7	30.1	25.6	21.1
TOTAL	656	64	60.4	55.8	51.3	46.7	42.2	37.7	33.2	28.7
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	1410	138	62.5	57.9	53.4	48.9	44.3	39.8	35.3	30.8
Med Trucks	14	1	52.9	48.3	43.8	39.3	34.8	30.2	25.7	21.2
Hvy Trucks	14	1	56.2	51.6	47.1	42.6	38.1	33.6	29.0	24.5
TOTAL	1439	141	63.8	59.2	54.7	50.2	45.6	41.1	36.6	32.1
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	1418	139	62.5	57.9	53.4	48.9	44.4	39.9	35.3	30.8
Med Trucks	14	1	52.9	48.3	43.8	39.3	34.8	30.3	25.7	21.2
Hvy Trucks	14	1	56.3	51.6	47.1	42.6	38.1	33.6	29.1	24.5
TOTAL	1447	142	63.8	59.2	54.7	50.2	45.7	41.1	36.6	32.1
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	775	76	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Med Trucks	8	1	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Hvy Trucks	8	1	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
TOTAL	791	77	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
CHANGE FROM FUTURE NO PROJECT										
Autos	8	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	8	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-NorthShoreEOStanfieldSunday Year 2030 Sunday

Location: North Shore Drive East of Stanfield Cutoff

	Traffic Volume		Noise Reference	Noise Level (dB Ldn) Centerline Distance (feet)						
				100	200	400	800	1600	3200	6400
Vehicle Type	24-hr volume	Equiv 1-hr	Level (15 meters	30	61	122 (meters)	244	488	975	1951
EXISTING (2007)										
Autos	601	59	58.8	54.2	49.7	45.2	40.6	36.1	31.6	27.1
Med Trucks	6	1	49.2	44.6	40.1	35.6	31.0	26.5	22.0	17.5
Hvy Trucks	6	1	52.5	47.9	43.4	38.9	34.4	29.8	25.3	20.8
TOTAL	613	60	60.1	55.5	51.0	46.4	41.9	37.4	32.9	28.4
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	1138	111	61.6	57.0	52.4	47.9	43.4	38.9	34.4	29.9
Med Trucks	12	1	52.0	47.4	42.9	38.3	33.8	29.3	24.8	20.3
Hvy Trucks	12	1	55.3	50.7	46.2	41.7	37.1	32.6	28.1	23.6
TOTAL	1161	114	62.9	58.2	53.7	49.2	44.7	40.2	35.7	31.2
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	1143	112	61.6	57.0	52.5	47.9	43.4	38.9	34.4	29.9
Med Trucks	12	1	52.0	47.4	42.9	38.4	33.8	29.3	24.8	20.3
Hvy Trucks	12	1	55.3	50.7	46.2	41.7	37.2	32.6	28.1	23.6
TOTAL	1166	114	62.9	58.3	53.8	49.2	44.7	40.2	35.7	31.2
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	542	53	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Med Trucks	6	1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Hvy Trucks	6	1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
TOTAL	553	54	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
CHANGE FROM FUTURE NO PROJECT										
Autos	5	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	5	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-NorthShoreWOStanfield Year 2030 Weekday

Location: North Shore Drive West of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	291	28	55.7	51.0	46.5	42.0	37.5	33.0	28.5	23.9
Med Trucks	3	0	46.1	41.4	36.9	32.4	27.9	23.4	18.9	14.4
Hvy Trucks	3	0	49.4	44.8	40.2	35.7	31.2	26.7	22.2	17.7
TOTAL	297	29	56.9	52.3	47.8	43.3	38.8	34.3	29.8	25.2
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	1649	161	63.2	58.6	54.1	49.5	45.0	40.5	36.0	31.5
Med Trucks	17	2	53.6	49.0	44.5	39.9	35.4	30.9	26.4	21.9
Hvy Trucks	17	2	56.9	52.3	47.8	43.3	38.8	34.2	29.7	25.2
TOTAL	1683	165	64.5	59.9	55.3	50.8	46.3	41.8	37.3	32.8
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	1685	165	63.3	58.7	54.1	49.6	45.1	40.6	36.1	31.6
Med Trucks	17	2	53.7	49.1	44.6	40.0	35.5	31.0	26.5	22.0
Hvy Trucks	17	2	57.0	52.4	47.9	43.4	38.8	34.3	29.8	25.3
TOTAL	1719	168	64.6	60.0	55.4	50.9	46.4	41.9	37.4	32.9
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	1394	136	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Med Trucks	14	1	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Hvy Trucks	14	1	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
TOTAL	1422	139	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
CHANGE FROM FUTURE NO PROJECT										
Autos	35	3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Med Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hvy Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	36	4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-NorthShoreWOStanfieldSunday Year 2030 Sunday

Location: North Shore Drive West of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	460	45	57.6	53.0	48.5	44.0	39.5	35.0	30.4	25.9
Med Trucks	5	0	48.0	43.4	38.9	34.4	29.9	25.4	20.9	16.3
Hvy Trucks	5	0	51.4	46.7	42.2	37.7	33.2	28.7	24.2	19.7
TOTAL	469	46	58.9	54.3	49.8	45.3	40.8	36.3	31.7	27.2
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	1191	117	61.8	57.2	52.6	48.1	43.6	39.1	34.6	30.1
Med Trucks	12	1	52.2	47.6	43.0	38.5	34.0	29.5	25.0	20.5
Hvy Trucks	12	1	55.5	50.9	46.4	41.9	37.3	32.8	28.3	23.8
TOTAL	1215	119	63.1	58.4	53.9	49.4	44.9	40.4	35.9	31.4
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	1216	119	61.9	57.3	52.7	48.2	43.7	39.2	34.7	30.2
Med Trucks	12	1	52.3	47.7	43.1	38.6	34.1	29.6	25.1	20.6
Hvy Trucks	12	1	55.6	51.0	46.5	41.9	37.4	32.9	28.4	23.9
TOTAL	1241	122	63.2	58.5	54.0	49.5	45.0	40.5	36.0	31.4
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	757	74	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Med Trucks	8	1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Hvy Trucks	8	1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
TOTAL	772	76	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
CHANGE FROM FUTURE NO PROJECT										
Autos	25	2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Med Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hvy Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	26	3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT

FILE: NOISE-StanfieldBTWNorthShoreBigBear Year 2030 Weekday

Location: Stanfield Cutoff Between North Shore Dr and Big Bear Blvd

	Traffic Volume		Noise Reference	Noise Level (dB Ldn) Centerline Distance (feet)						
				100	200	400	800	1600	3200	6400
Vehicle Type	24-hr volume	Equiv 1-hr	Level (15 meters	(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	1350	132	62.3	57.7	53.2	48.7	44.2	39.6	35.1	30.6
Med Trucks	14	1	52.7	48.1	43.6	39.1	34.6	30.0	25.5	21.0
Hvy Trucks	14	1	56.0	51.4	46.9	42.4	37.9	33.4	28.9	24.3
TOTAL	1378	135	63.6	59.0	54.5	50.0	45.4	40.9	36.4	31.9
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	3067	300	65.9	61.3	56.8	52.2	47.7	43.2	38.7	34.2
Med Trucks	31	3	56.3	51.7	47.2	42.6	38.1	33.6	29.1	24.6
Hvy Trucks	31	3	59.6	55.0	50.5	46.0	41.4	36.9	32.4	27.9
TOTAL	3130	306	67.2	62.6	58.0	53.5	49.0	44.5	40.0	35.5
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	3123	306	66.0	61.3	56.8	52.3	47.8	43.3	38.8	34.3
Med Trucks	32	3	56.4	51.8	47.2	42.7	38.2	33.7	29.2	24.7
Hvy Trucks	32	3	59.7	55.1	50.6	46.0	41.5	37.0	32.5	28.0
TOTAL	3187	312	67.3	62.6	58.1	53.6	49.1	44.6	40.1	35.5
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	1773	174	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Med Trucks	18	2	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Hvy Trucks	18	2	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
TOTAL	1809	177	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
CHANGE FROM FUTURE NO PROJECT										
Autos	56	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Med Trucks	1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hvy Trucks	1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	57	6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-StnfildBTWNorShorBgBrSun Year 2030 Sunday

Location: Stanfield Cutoff Between North Shore Dr and Big Bear Blvd

	Traffic Volume		Noise Reference	Noise Level (dB Ldn) Centerline Distance (feet)						
				100	200	400	800	1600	3200	6400
Vehicle Type	24-hr volume	Equiv 1-hr	Level (15 meters	(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	1367	134	62.4	57.8	53.2	48.7	44.2	39.7	35.2	30.7
Med Trucks	14	1	52.8	48.2	43.6	39.1	34.6	30.1	25.6	21.1
Hvy Trucks	14	1	56.1	51.5	47.0	42.5	37.9	33.4	28.9	24.4
TOTAL	1395	137	63.7	59.0	54.5	50.0	45.5	41.0	36.5	32.0
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	2143	210	64.3	59.7	55.2	50.7	46.2	41.6	37.1	32.6
Med Trucks	22	2	54.7	50.1	45.6	41.1	36.6	32.1	27.5	23.0
Hvy Trucks	22	2	58.1	53.4	48.9	44.4	39.9	35.4	30.9	26.3
TOTAL	2187	214	65.6	61.0	56.5	52.0	47.5	42.9	38.4	33.9
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	2184	214	64.4	59.8	55.3	50.8	46.2	41.7	37.2	32.7
Med Trucks	22	2	54.8	50.2	45.7	41.2	36.7	32.1	27.6	23.1
Hvy Trucks	22	2	58.1	53.5	49.0	44.5	40.0	35.5	30.9	26.4
TOTAL	2229	218	65.7	61.1	56.6	52.1	47.5	43.0	38.5	34.0
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	817	80	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Med Trucks	8	1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Hvy Trucks	8	1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
TOTAL	834	82	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CHANGE FROM FUTURE NO PROJECT										
Autos	41	4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Med Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hvy Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	42	4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-StanfieldNONorthShore Year 2030 Weekday

Location: Stanfield Cutoff North of North Shore Drive

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	30	3	45.8	41.2	36.7	32.2	27.7	23.2	18.6	14.1
Med Trucks	0	0	36.3	31.6	27.1	22.6	18.1	13.6	9.1	4.5
Hvy Trucks	0	0	39.6	34.9	30.4	25.9	21.4	16.9	12.4	7.9
TOTAL	31	3	47.1	42.5	38.0	33.5	29.0	24.5	19.9	15.4
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	58	6	48.6	44.0	39.5	35.0	30.5	26.0	21.4	16.9
Med Trucks	1	0	39.0	34.4	29.9	25.4	20.9	16.4	11.8	7.3
Hvy Trucks	1	0	42.4	37.7	33.2	28.7	24.2	19.7	15.2	10.7
TOTAL	59	6	49.9	45.3	40.8	36.3	31.8	27.2	22.7	18.2
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	58	6	48.6	44.0	39.5	35.0	30.5	26.0	21.4	16.9
Med Trucks	1	0	39.0	34.4	29.9	25.4	20.9	16.4	11.8	7.3
Hvy Trucks	1	0	42.4	37.7	33.2	28.7	24.2	19.7	15.2	10.7
TOTAL	59	6	49.9	45.3	40.8	36.3	31.8	27.2	22.7	18.2
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	27	3	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Med Trucks	0	0	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Hvy Trucks	0	0	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
TOTAL	28	3	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
CHANGE FROM FUTURE NO PROJECT										
Autos	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-StanfieldNONorthShoreSunday Year 2030 Sunday

Location: Stanfield Cutoff North of North Shore Drive

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	39	4	47.0	42.3	37.8	33.3	28.8	24.3	19.8	15.2
Med Trucks	0	0	37.4	32.7	28.2	23.7	19.2	14.7	10.2	5.6
Hvy Trucks	0	0	40.7	36.1	31.5	27.0	22.5	18.0	13.5	9.0
TOTAL	40	4	48.2	43.6	39.1	34.6	30.1	25.6	21.0	16.5
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	58	6	48.6	44.0	39.5	35.0	30.5	26.0	21.4	16.9
Med Trucks	1	0	39.0	34.4	29.9	25.4	20.9	16.4	11.8	7.3
Hvy Trucks	1	0	42.4	37.7	33.2	28.7	24.2	19.7	15.2	10.7
TOTAL	59	6	49.9	45.3	40.8	36.3	31.8	27.2	22.7	18.2
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	58	6	48.6	44.0	39.5	35.0	30.5	26.0	21.4	16.9
Med Trucks	1	0	39.0	34.4	29.9	25.4	20.9	16.4	11.8	7.3
Hvy Trucks	1	0	42.4	37.7	33.2	28.7	24.2	19.7	15.2	10.7
TOTAL	59	6	49.9	45.3	40.8	36.3	31.8	27.2	22.7	18.2
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	19	2	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Med Trucks	0	0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Hvy Trucks	0	0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TOTAL	19	2	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
CHANGE FROM FUTURE NO PROJECT										
Autos	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-StanfieldSOBigBear Year 2030 Weekday

Location: Stanfield Cutoff South of Big Bear Blvd

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	298	29	55.8	51.1	46.6	42.1	37.6	33.1	28.6	24.0
Med Trucks	3	0	46.2	41.5	37.0	32.5	28.0	23.5	19.0	14.5
Hvy Trucks	3	0	49.5	44.9	40.3	35.8	31.3	26.8	22.3	17.8
TOTAL	304	30	57.0	52.4	47.9	43.4	38.9	34.4	29.9	25.3
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	400	39	57.0	52.4	47.9	43.4	38.9	34.4	29.8	25.3
Med Trucks	4	0	47.4	42.8	38.3	33.8	29.3	24.8	20.2	15.7
Hvy Trucks	4	0	50.8	46.1	41.6	37.1	32.6	28.1	23.6	19.1
TOTAL	408	40	58.3	53.7	49.2	44.7	40.2	35.6	31.1	26.6
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	400	39	57.0	52.4	47.9	43.4	38.9	34.4	29.8	25.3
Med Trucks	4	0	47.4	42.8	38.3	33.8	29.3	24.8	20.2	15.7
Hvy Trucks	4	0	50.8	46.1	41.6	37.1	32.6	28.1	23.6	19.1
TOTAL	408	40	58.3	53.7	49.2	44.7	40.2	35.6	31.1	26.6
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	102	10	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Med Trucks	1	0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Hvy Trucks	1	0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
TOTAL	104	10	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
CHANGE FROM FUTURE NO PROJECT										
Autos	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-StanfieldSOBigBearSunday Year 2030 Sunday

Location: Stanfield Cutoff South of Big Bear Blvd

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	331	32	56.2	51.6	47.1	42.6	38.1	33.5	29.0	24.5
Med Trucks	3	0	46.6	42.0	37.5	33.0	28.5	23.9	19.4	14.9
Hvy Trucks	3	0	49.9	45.3	40.8	36.3	31.8	27.3	22.7	18.2
TOTAL	338	33	57.5	52.9	48.4	43.9	39.3	34.8	30.3	25.8
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	388	38	56.9	52.3	47.8	43.3	38.7	34.2	29.7	25.2
Med Trucks	4	0	47.3	42.7	38.2	33.7	29.1	24.6	20.1	15.6
Hvy Trucks	4	0	50.6	46.0	41.5	37.0	32.5	28.0	23.4	18.9
TOTAL	396	39	58.2	53.6	49.1	44.5	40.0	35.5	31.0	26.5
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	388	38	56.9	52.3	47.8	43.3	38.7	34.2	29.7	25.2
Med Trucks	4	0	47.3	42.7	38.2	33.7	29.1	24.6	20.1	15.6
Hvy Trucks	4	0	50.6	46.0	41.5	37.0	32.5	28.0	23.4	18.9
TOTAL	396	39	58.2	53.6	49.1	44.5	40.0	35.5	31.0	26.5
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	57	6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Med Trucks	1	0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Hvy Trucks	1	0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
TOTAL	58	6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
CHANGE FROM FUTURE NO PROJECT										
Autos	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

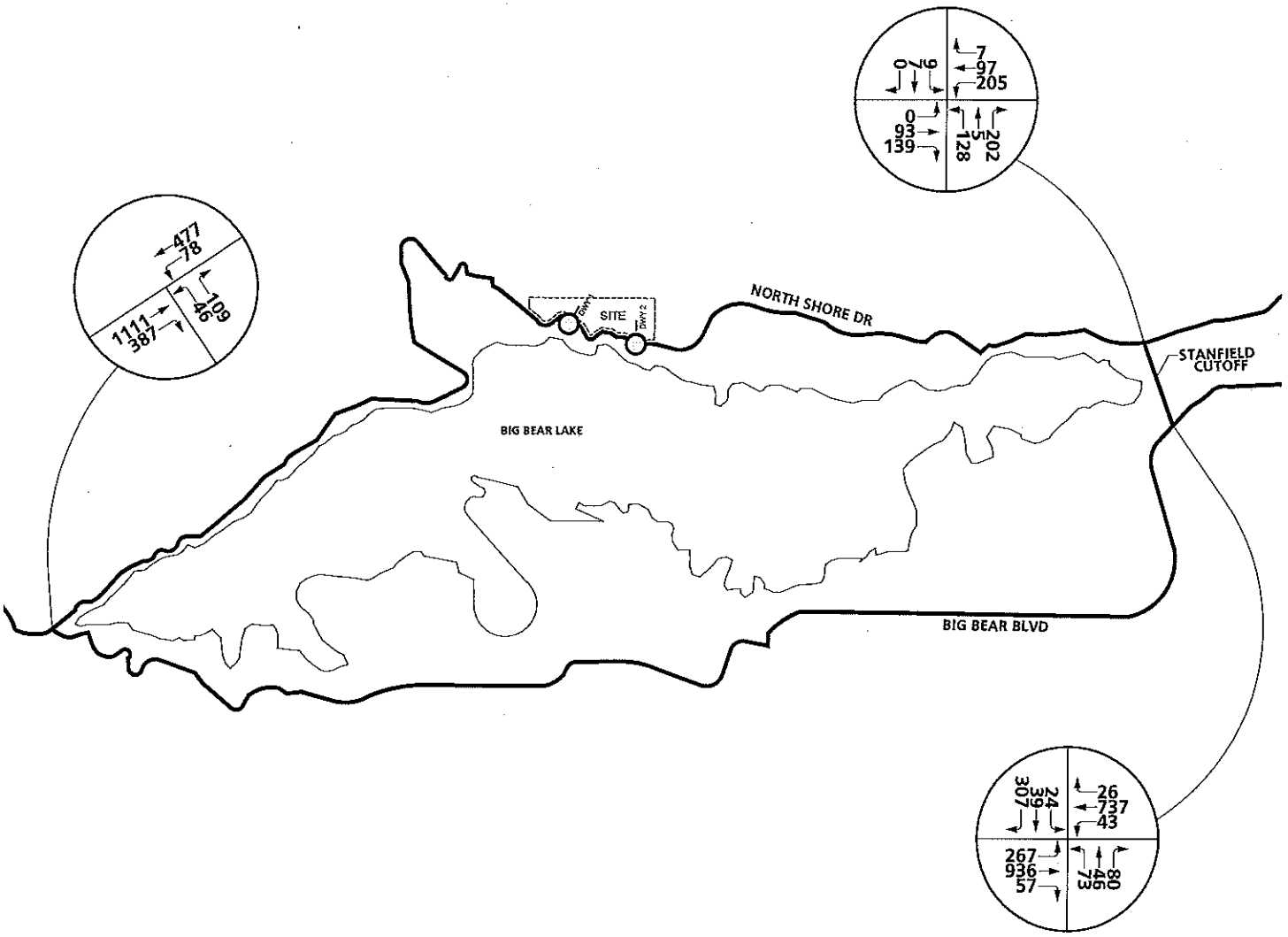
Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

D.2 - Exhibit 3-D, Existing Sunday Mid-Day Peak Hour Intersection Volumes (Urban Crossroads, No Date)

EXHIBIT 3-D

EXISTING SUNDAY MID-DAY PEAK HOUR INTERSECTION VOLUMES



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Appendix E:
Traffic Impact Analysis

E.1 - Traffic Study
(Urban Crossroads, April 2007)

URBAN
CROSSROADS

5411 Avenida Encinas, Suite 100
Carlsbad, CA 92008

Prepared by:

Scott Sato, P.E.
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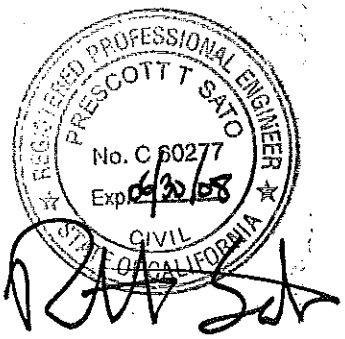
James Santos



Prepared for:

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MOON CAMP
TRAFFIC IMPACT ANALYSIS
COUNTY OF SAN BERNARDINO, CALIFORNIA

April 24, 2007

JN:04409-02
SS :RA :JCS

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MOON CAMP
TRAFFIC IMPACT ANALYSIS
COUNTY OF SAN BERNARDINO, CALIFORNIA

1.0 INTRODUCTION

This report summarizes the traffic impact analysis conducted to assess the potential impacts of the proposed Moon Camp residential development on the roadway system in the study area. The proposed development is generally located along North Shore Drive in the County of San Bernardino. The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and three lots for open space and common area on approximately 62.43 acres. The general location of the project site is presented on Exhibit 1-A.

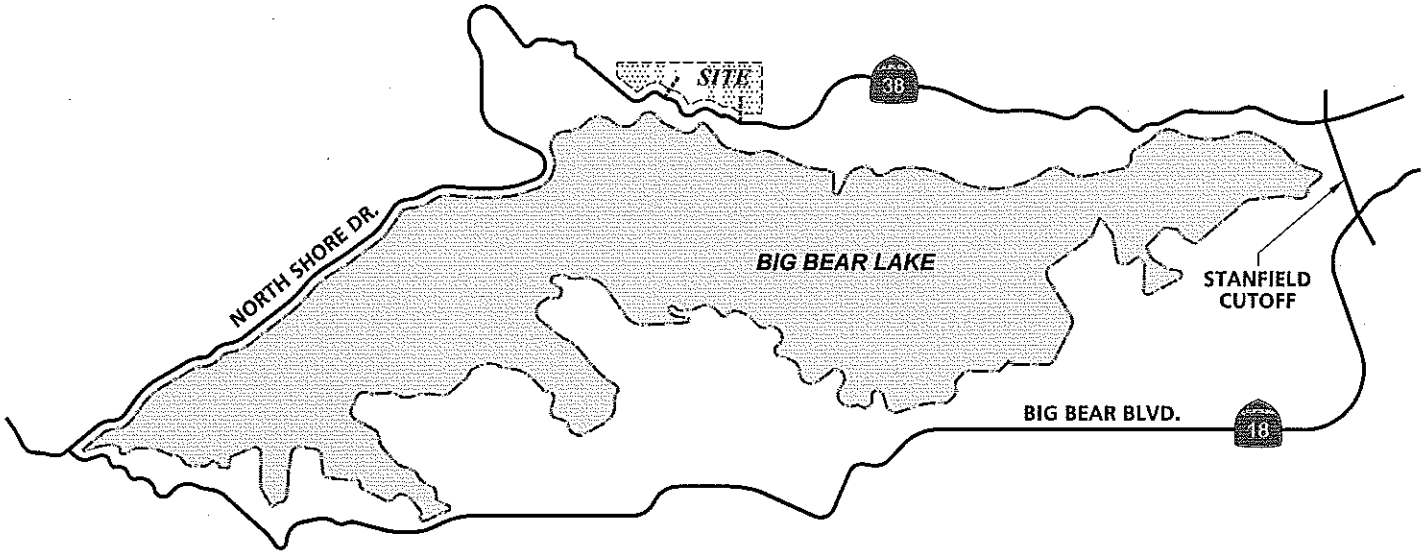
In conformance with the requirements of the San Bernardino County Congestion Management Program (CMP), the proposed project does not require a CMP traffic study. The CMP requires no analysis for projects generating less than 250 peak hour trips. The project generates approximately 51 and 51 trips during the AM and PM peak hours, respectively; which is less than the required threshold for a CMP traffic study. However, per discussion with County staff, the traffic study should follow CMP guidelines and a long-range traffic analysis is required.

The introduction to this report presents an overview of the project and provides a brief description of the study area. The analysis methodologies used to evaluate the impacts of the project are described and the definitions of roadway system deficiencies and significant project impacts are presented in the context of the County of San Bernardino and CEQA requirements.

Subsequent sections of the report will describe the project in detail and provide a complete description of existing and projected traffic conditions within the study area.

EXHIBIT 1-A

LOCATION MAP



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1.1 Project Overview

The proposed Moon Camp residential development is generally located north of North Shore Drive south of Flicker Road and east of Canyon Road in San Bernardino County. The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and three open space lots and common area. Exhibit 1-B illustrates the site plan.

There are two (2) primary full access points to the project site located off North Shore Drive.

Additional detailed discussion of the roadway network features of the project and its traffic generation characteristics will be provided in subsequent sections of this report.

1.2 Study Area

The overall study area evaluated in this study is presented on Exhibit 1-A. Based on discussion with County transportation staff, the study area includes the following existing study intersections:

Stanfield Cutoff (NS) at:

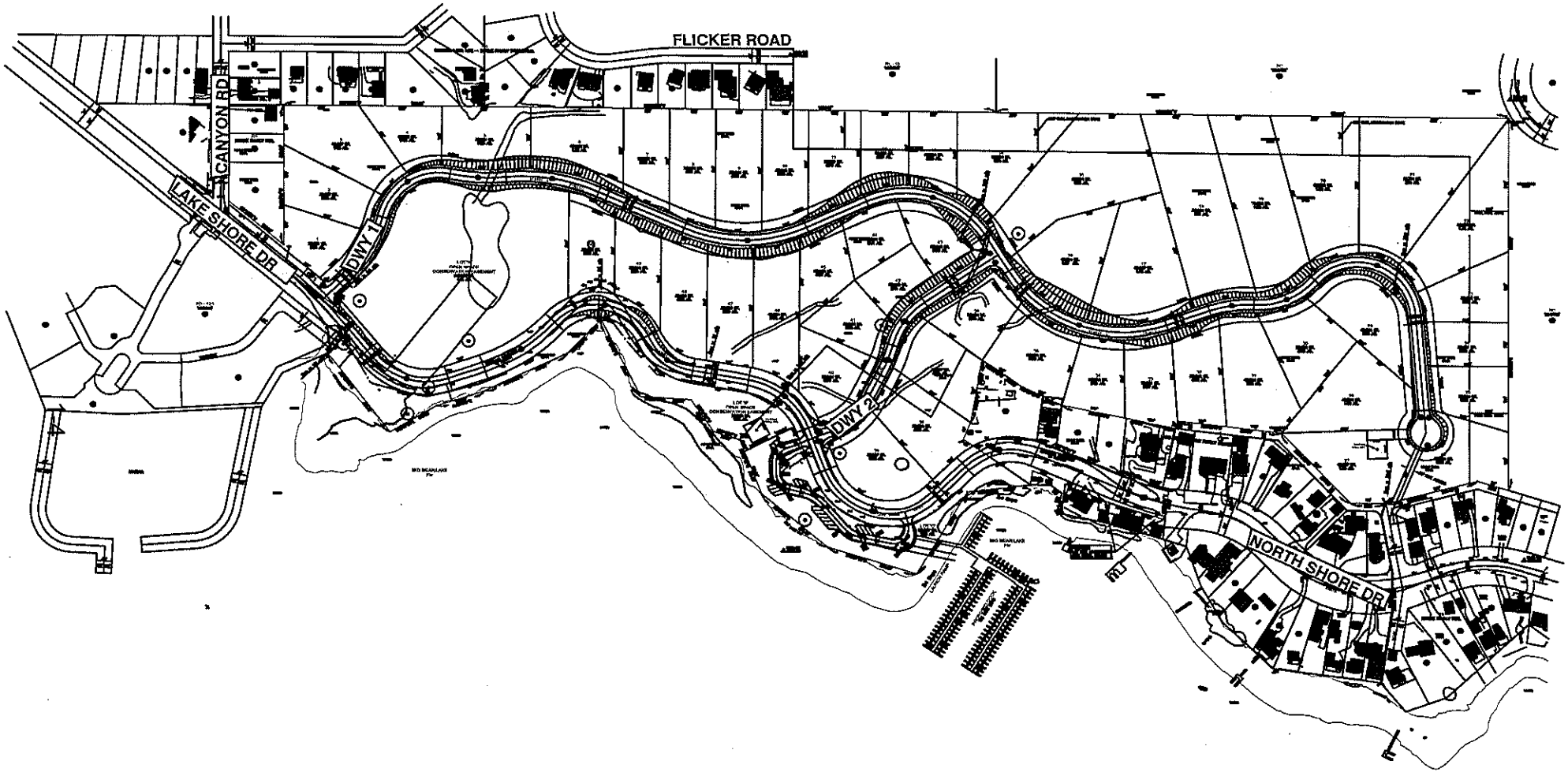
- North Shore Drive (SR-38) (EW)
- Big Bear Boulevard (SR-18) (EW)

North Shore Drive (SR-38) (NS) at:

- Big Bear Boulevard (SR-18) (EW)

EXHIBIT 1-B

SITE PLAN



URBAN CROSSROADS

1.3 Analysis Methodologies

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with the San Bernardino County Congestion Management Program. The following analysis years are considered in this report:

- Existing Condition – 2007
- Interim Year – 2010
- Long Range – 2030

The overall methodologies used to develop future traffic volume forecasts, and the explicit traffic operations analysis methodologies are summarized herein. The primary section of interest to the non-technically oriented reviewer is Section 1.4.2 (Definition of Significant Impact).

1.3.1 Overall Analysis Methodology

As described previously, traffic conditions are evaluated in this report for existing conditions, 2010 Interim Year Without Project conditions, 2010 Interim Year With Project conditions, and Long Range General Plan Buildout (2030) conditions.

Actual traffic count data was obtained from manual intersection counts (conducted in March 2007, see Appendix "A") to quantify existing traffic conditions. Per discussion with County staff, the peak season of the study area occurs during the summer months, thus a 16% growth is applied to manual intersection counts to represent existing peak hour intersection volumes.

Project traffic volumes for all future conditions were estimated using the manual approach. Trip generation has been estimated based on data collected by the Institute of Transportation Engineers (ITE). The project trip distribution was derived from a select zone run of the San Bernardino Mountain Model.

Interim Year conditions have been estimated based on areawide growth (other projects that are approved, pending, or under construction) and the addition of the project related peak hour volumes. An area-wide growth of 2% per year is applied to adjusted existing volumes (with 16% growth).

The Interim Year 2010 without project traffic volumes are estimated based on the 2007 existing traffic volumes (with 16% adjustment) plus the 2007 to 2010 background growth volumes (2%) plus the known cumulative development volumes.

Project traffic volumes for all future conditions were estimated using the manual approach described in the CMP guidelines. The trip generation calculation is based on the most recent Institute of Transportation Engineers Trip Generation Rates, 7th Edition. The project trip distribution was developed from a select zone run of the San Bernardino Mountain Model and was reviewed by the County of San Bernardino staff. The project only traffic forecasts have been generated by applying the trip generation, distribution and traffic assignment calculations.

Long Range General Plan Buildout (2030) conditions have been estimated based on the San Bernardino Mountain Model and the addition of both the project related peak hour volumes and the known cumulative development peak hour volumes per discussions with County staff.

1.3.2 Traffic Operations Analysis

The current technical guide to the evaluation of traffic operations is the 2000 Highway Capacity Manual (HCM) (Transportation Research Board Special Report 209). The HCM defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS (Level of Service) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted. The definitions of level of service for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- LOS "A" represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.

- LOS "B" is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.

- LOS "C" is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.

- LOS "D" represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.

- LOS "E" represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.

- LOS "F" is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

Uninterrupted flow is generally found only on limited access (freeway) facilities in urban areas. The definitions of level of service for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control.

The level of service is typically dependent on the quality of traffic flow at the intersections along a roadway. The HCM methodology expresses the level of service at an intersection in terms of delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control. The levels of service determined in this study are calculated using the HCM methodology.

For signalized intersections, average total delay per vehicle for the overall intersection is used to determine level of service. Levels of service at signalized study intersections have been evaluated using an HCM intersection analysis program.

The study area intersections which are stop sign controlled with stop-control on the minor street only have been analyzed using the two-way stop

controlled unsignalized intersection analysis methodology of the HCM. For these intersections, the calculation of level of service is dependent on the occurrence of gaps occurring in the traffic flow of the main street. Using data collected describing the intersection configuration and traffic volumes at these locations to calculate average intersection delay; the level of service has been calculated. The level of service criteria for this type of intersection analysis is based on total delay per vehicle for the worst minor street movement(s).

The levels of service are defined in terms of average delay for the intersection analysis methodology as follows:

LEVEL OF SERVICE	AVERAGE TOTAL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	0 to 10.00	0 to 10.00
B	10.1 to 20.00	10.01 to 15.00
C	20.1 to 35.00	15.01 to 25.00
D	35.1 to 55.00	25.01 to 35.00
E	55.1 to 80.00	35.01 to 50.00
F	Over 80.0 or V/C ≥ 1.00	50.01 and up

Per the CMP guidelines, signalized intersections are considered deficient (LOS "F") if the overall intersection critical volume to capacity (V/C) ratio equals or exceeds 1.0, even if the level of service defined by the delay value is below the defined LOS standard. The V/C ratio is defined as the critical volumes divided by the intersection capacity. A V/C ratio greater than 1.0 implies an infinite queue.

The LOS analysis for signalized intersections has been performed using optimized signal timing. This analysis has included an assumed lost time of two seconds per phase in accordance with San Bernardino CMP recommended default values. Signal timing optimization has considered pedestrian safety and signal coordination requirements. Appropriate time for pedestrian crossing have also been considered in the signalized intersection analysis. The following formula has been used to calculate the pedestrian minimum times for all HCM runs:

[(Curb to Curb distance) / (4 feet/second)] + 5 seconds

The resulting minimum green times are shown in the appendices for each analyzed scenario. Saturation flow rates of 1,800 vehicles per hour of green (vphg) for through and right-turn lanes and 1,700 vphg for single left-turn lanes, 1,600 vphg per lane for dual left-turn lanes, and 1,500 vphg per lane for triple left-turn lanes have been assumed for all capacity analysis under 2007 Existing and 2010 Interim Year conditions. Under 2030 Horizon Year conditions, saturation flow rates of 1,900 vphg for through and right-turn lanes and 1,800 vphg for single left-turn lanes, 1,700 vphg per lane for dual left-turn lanes, and 1,600 vphg per lane for triple left-turn lanes have been assumed. These are the default values recommended by the CMP guidelines.

The 2030 peak hour factor has been adjusted upwards to 0.95. This is specifically allowed by the San Bernardino CMP guidelines to account for the effects of congestion on peak spreading. Peak spreading refers to the tendency of traffic to spread more evenly across time as congestion increases.

1.4 Definition of Deficiency and Significant Impact

The following definitions of deficiencies and significant impacts have been developed in accordance with the County of San Bernardino requirements.

1.4.1 Definition of Deficiency

County of San Bernardino guidelines indicate that peak hour intersection operations of LOS "C" or better are considered acceptable. Therefore, any intersection operating at LOS "D" or worse is considered deficient. Per CMP direction, state controlled facilities (state highways, freeway ramp intersection, etc.) are subject to local jurisdiction (California Department of Transportation) traffic operations requirements, with no greater than 45 seconds average stopped delay per vehicle allowed during peak hour operations (middle of LOS "D")

The identification of a CMP deficiency requires further analysis in satisfaction of CMP and County requirements, including:

- Evaluation of the mitigation measures required to restore traffic operations to an acceptable level of service with respect to CMP and local jurisdiction LOS standards.
- Calculation of the project share of new traffic on the impacted CMP facility during peak hours of traffic.
- Estimation of the cost required to implement the improvements required to restore traffic operations to an acceptable level of service as described above.

This study incorporates each of these aspects for all locations where a CMP deficiency is identified.

1.4.2 Definition of Significant Impact

The identification of significant impacts is a requirement of CEQA, and is not directly addressed in the CMP document. The County of San Bernardino General Plan and Circulation Element have been adopted in accordance with CEQA requirements, and any roadway improvements within the County of San Bernardino which are consistent with these documents are not considered a significant impact, so long as the project contributes its "fair share" funding for improvements.

A traffic impact is considered significant and immitigable if the project both: i) contributes measurable traffic to and ii) substantially and adversely changes the level of service at any off-site location projected to experience deficient operations under foreseeable cumulative conditions, where feasible improvements consistent with the County of San Bernardino General Plan cannot be constructed.

2.0 PROJECT DESCRIPTION

This section describes the project land uses and traffic characteristics for each of the future conditions analyzed.

2.1 Project Description

The proposed Moon Camp residential development is located along North Shore Drive in the County of San Bernardino. The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and one existing single-family detached dwelling unit. Exhibit 1-B (previously presented) illustrates the site plan.

There are two (2) primary full access points to the project site located off North Shore Drive.

2.2 Project Traffic

The traffic related to the project has been calculated in accordance with the following accepted procedural steps:

- Trip Generation
- Trip Distribution
- Traffic Assignment

These steps are described in detail below.

2.2.1 Project Trip Generation

The trip generation calculation is based on the most recent Institute of Transportation Engineers Trip Generation Rates, 7th Edition. Table 2-1 indicates the proposed trip generation rates. As indicated in Table 2-2, the

TABLE 2-1

TRIP GENERATION RATES[1]

LAND USE	ITE CODE	QUANTITY	UNITS[2]	FRIDAY PM PEAK HOUR			SUNDAY MID-DAY PEAK HOUR			DAILY
				IN	OUT	TOTAL	IN	OUT	TOTAL	
PROJECT										
Single Family Residential	210	50	DU	0.64	0.37	1.01	0.64	0.37	1.01	9.57
CUMULATIVE PROJECTS										
Hotel	310	Varies	ROOMS	0.31	0.28	0.59	0.31	0.28	0.59	8.17
Townhomes/Condominium	230	78	DU	0.35	0.17	0.52	0.35	0.17	0.52	5.86
Fast Food Restaurant With Drive-Thru	934	2.5	TSF	18.01	16.63	34.64	18.01	16.63	34.64	496.12
Shopping Center	820	10	TSF	6.57	7.12	13.70	6.57	7.12	13.70	152.03
Shopping Center	820	22.517	TSF	4.99	5.40	10.39	4.99	5.40	10.39	114.43
Automobile Care Center	942	4.375	TSF	1.69	1.69	3.38	1.69	1.69	3.38	20.00
Mini-Warehouse	151	3	AC	1.99	1.84	3.83	1.99	1.84	3.83	38.87
Office	710	6.3	TSF	0.17	0.83	1.00	0.17	0.83	1.00	11.01
Church	560	20	TSF	0.34	0.32	0.66	0.34	0.32	0.66	9.11

[1] Source: ITE (Institute of Transportation Engineers) Trip Generation Manual, 7th Edition, 2003.

[2] DU = Dwelling Units

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TABLE 2-2

PROJECT TRIP GENERATION SUMMARY

LAND USE	QUANTITY	UNITS[1]	FRIDAY PM PEAK HOUR			SUNDAY MID-DAY PEAK HOUR			DAILY
			IN	OUT	TOTAL	IN	OUT	TOTAL	
Single Family Residential	50	DU	32	19	51	32	19	51	479

[1] DU = Dwelling Units

S:\Carlsbad_Jobs_04400\04409\excel\[04409-05.xls]T 2-2

proposed Moon Camp residential development is projected to generate 479 trip-ends per day with 51 vehicles per hour during the weekday AM peak hour and 51 vehicles per hour during the weekday PM peak hour. It is our understanding that the weekday PM peak hour generates more trips than the Sunday Midday peak hour. Based on discussions with County of San Bernardino staff, weekday PM peak hour trip generation has been used in both Friday PM peak hour analysis and Sunday Mid-day peak hour analysis to represent a conservative worst case condition.

2.2.2 Project Trip Distribution and Assignment

The project trip distribution and assignment process represents the directional orientation of traffic to and from the project site. Trip distribution is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system.

Project trip distribution has been derived from a select zone run of the San Bernardino Mountain Model. The trip distribution pattern for both Friday PM peak and Sunday Mid-day peak is based on the Friday PM distribution per discussions with County staff. Exhibit 2-A illustrates the project trip distribution.

2.2.3 Project Only Traffic Volume Forecasts

The project only traffic forecasts have been generated by applying the trip generation, distribution and traffic assignment calculations. The project ADT volumes are presented on Exhibit 2-B. The project only Friday PM peak hour and Sunday Mid-day peak hour intersection volumes are depicted on Exhibit 2-C.

EXHIBIT 2-A

PROJECT TRIP DISTRIBUTION

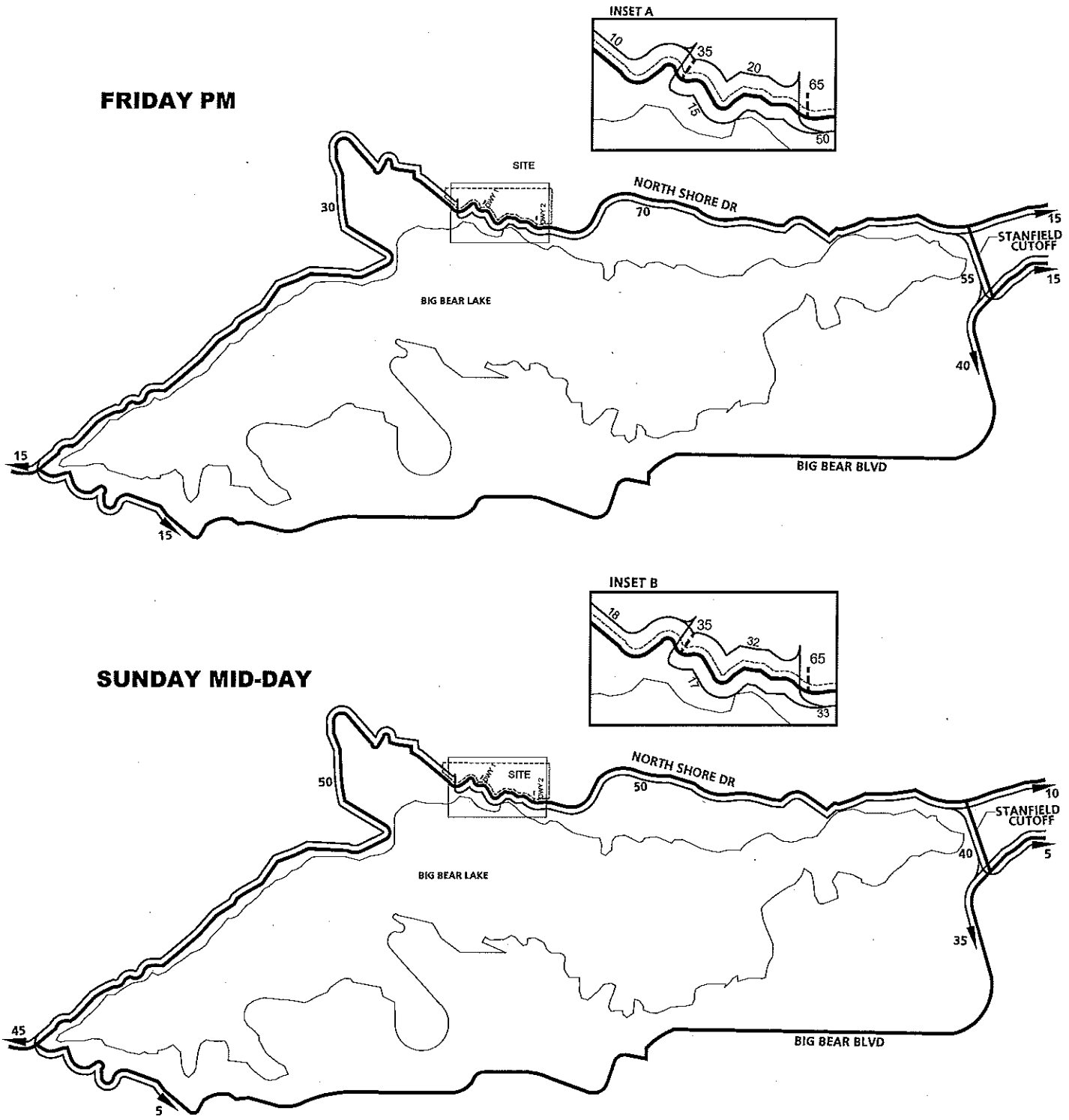
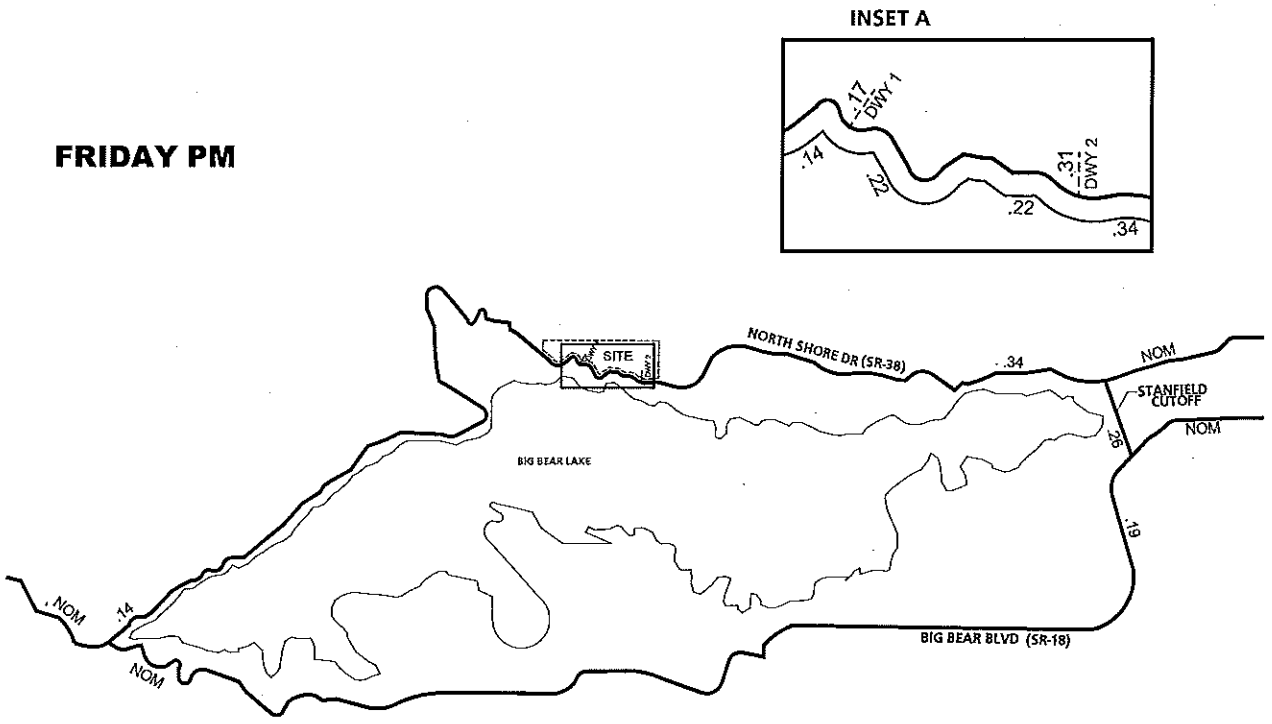


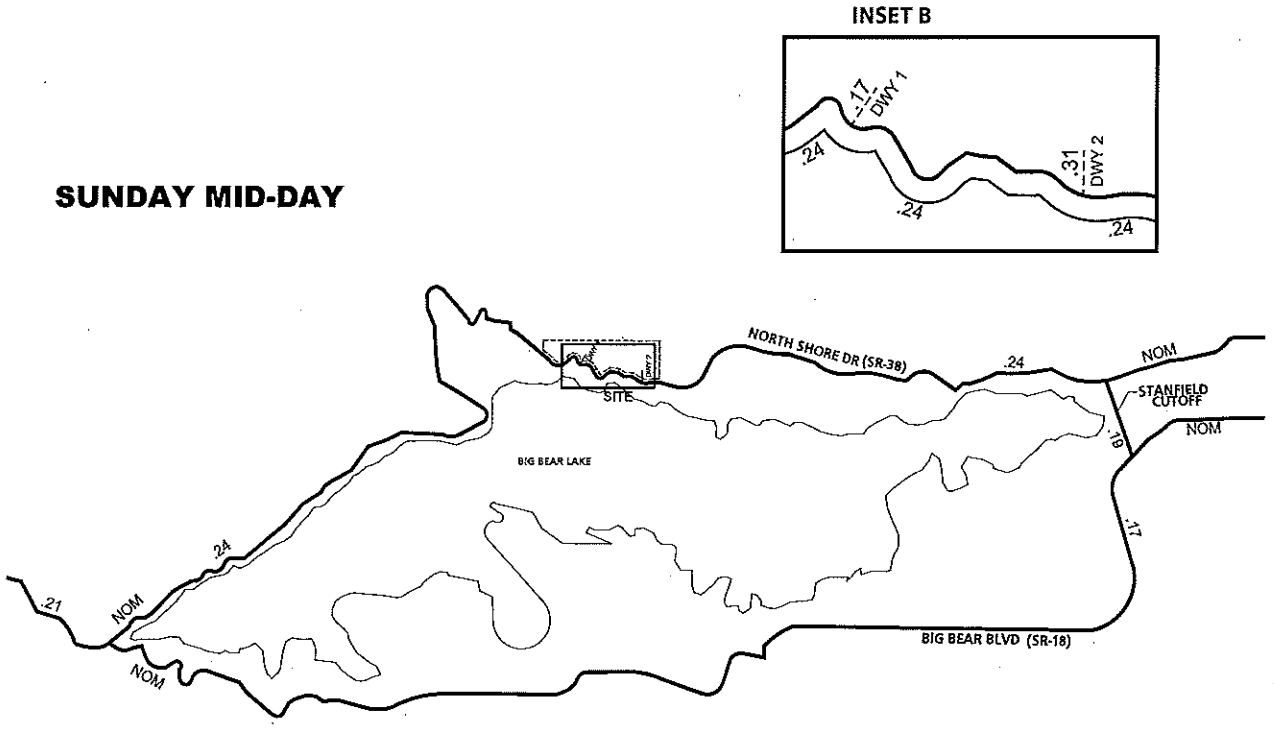
EXHIBIT 2-B

PROJECT AVERAGE DAILY TRAFFIC

FRIDAY PM



SUNDAY MID-DAY

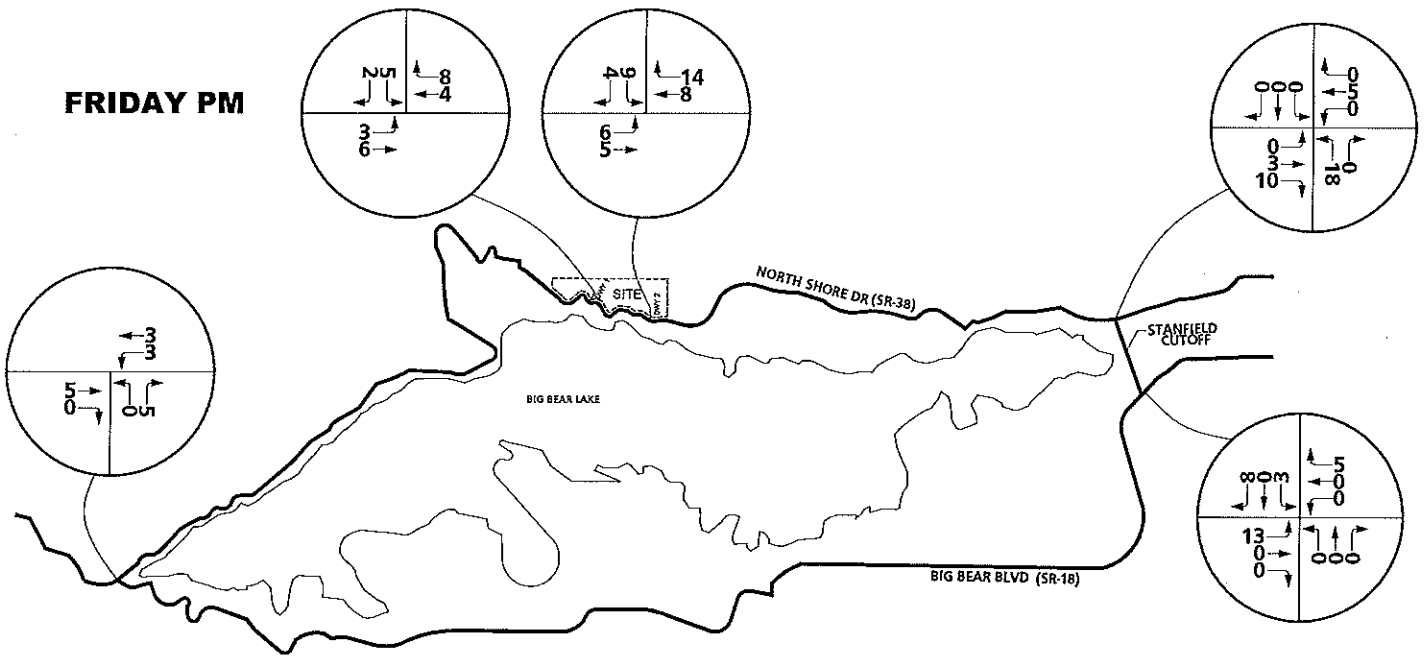


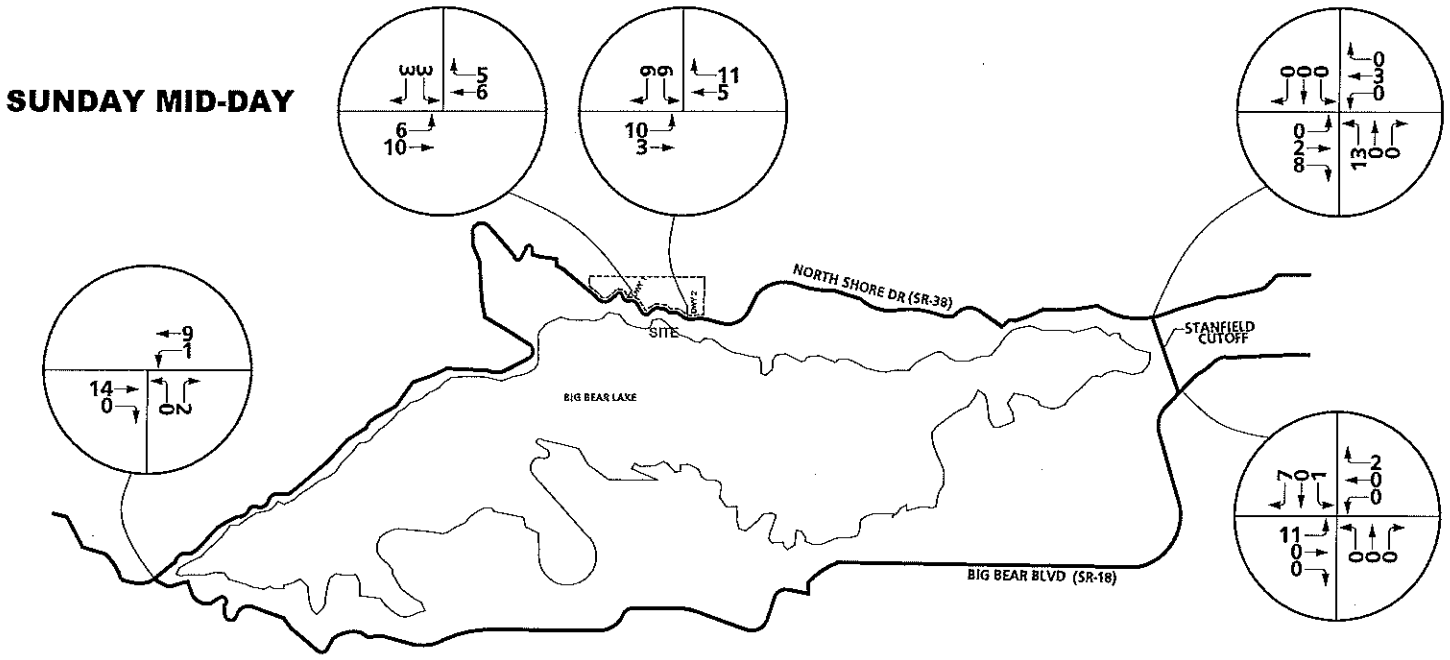
LEGEND:

10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

EXHIBIT 2-C

PROJECT FRIDAY PM PEAK HOUR / SUNDAY MIDDAY PEAK HOUR INTERSECTION VOLUMES





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3.0 EXISTING CONDITIONS

This section of the report summarizes existing roadway and traffic conditions in the study area. All analysis locations which exist today have been analyzed. The number of through travel lanes for existing roadways and intersection controls are presented, along with existing traffic count data collected for this study. This data was used to analyze existing traffic operations in the study area. Existing plans for roadway improvements are also described in this section.

3.1 Existing Roadway System and Daily Traffic Volumes

The number of through travel lanes for existing roadways and existing intersection controls within the study area are presented on Exhibit 3-A.

Exhibits 3-B and 3-C depict the current average daily traffic (ADT) volumes in the study area on Friday and Sunday, respectively. Existing ADT volumes are estimated based upon the latest traffic data collected by Urban Crossroads, Inc. (see Appendix "A"). Peak hour data has been used to estimate the average daily traffic volumes on each leg using the following formula:

Peak Hour (Approach Volume + Exit Volume) x 12 = Leg Volume.

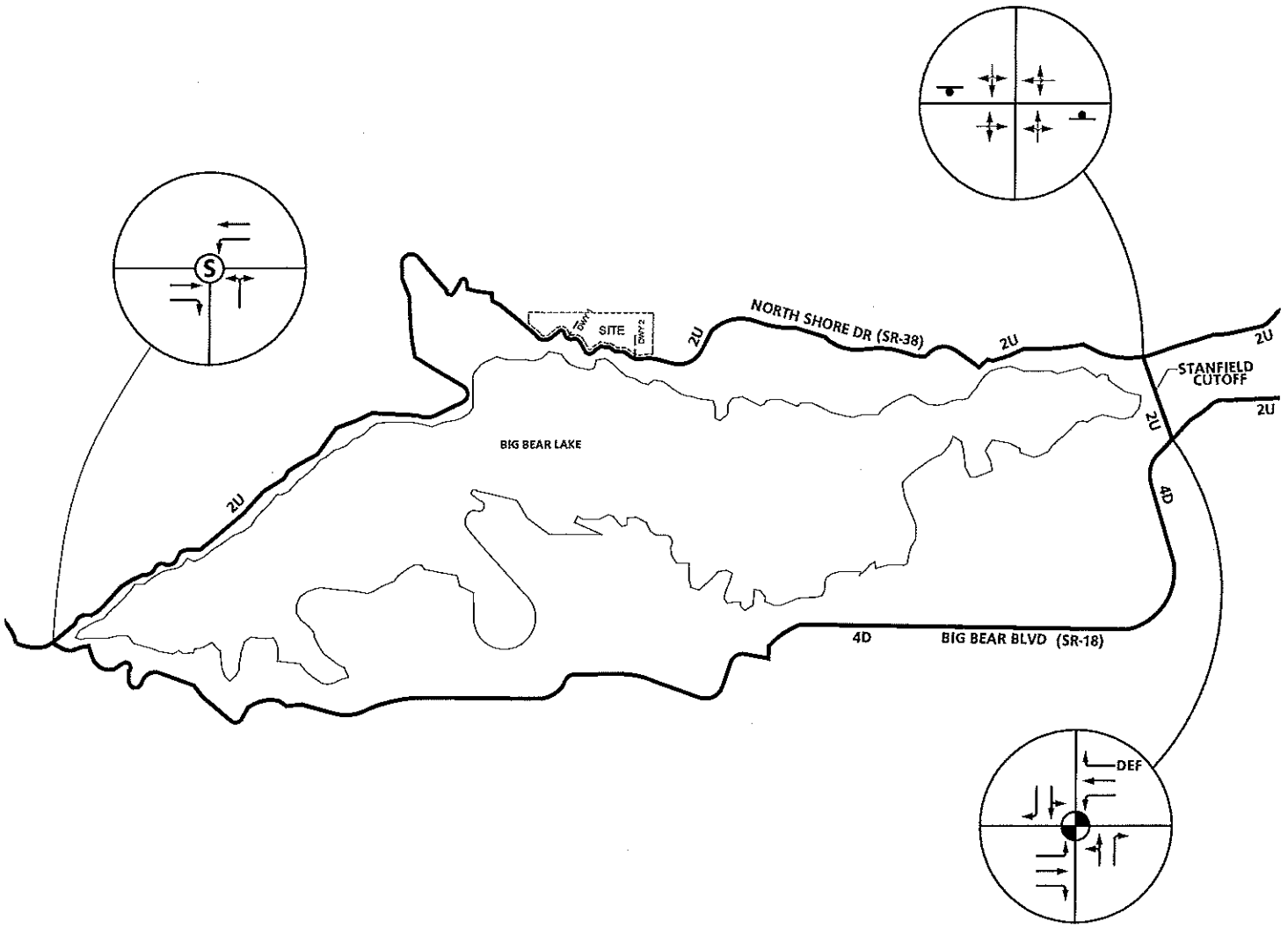
Regional access to the site is provided by North Shore Drive (SR-38)

3.2 Existing Peak Hour Traffic Volumes

Actual traffic count data was obtained from manual intersection counts (March 2007, see Appendix "A") to quantify existing traffic conditions. The Friday PM peak hour traffic volumes were determined by counting the two hour period between 4:00 PM- 6:00 PM in the evening. The Sunday Mid-day peak hour traffic volumes were identified by counting the two hour period from 12:00 PM – 2:00 PM. Per discussions with County staff, since the peak season of the study area occurs during the summer months, a 16% growth is applied to the manual intersection counts to represent existing peak hour intersection volumes.

EXHIBIT 3-A

EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



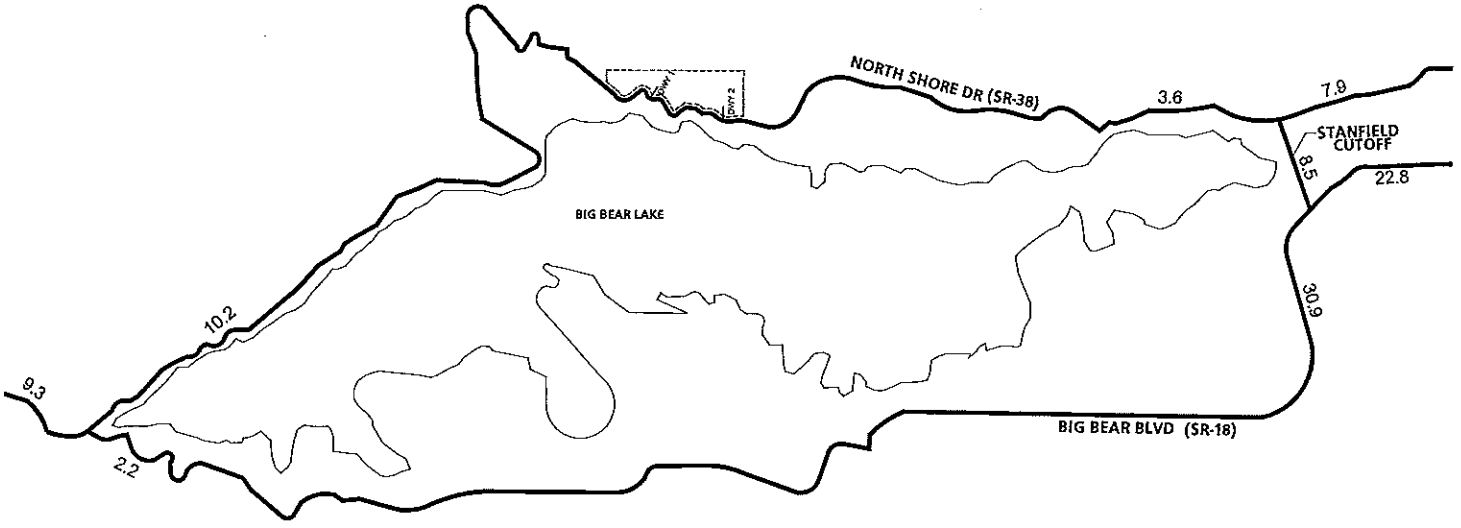
LEGEND:

- = TRAFFIC SIGNAL
- (S) = ALL WAY STOP
- = STOP SIGN
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- DEF = DEFACTO RIGHT TURN LANE

N

EXHIBIT 3-B

EXISTING FRIDAY AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

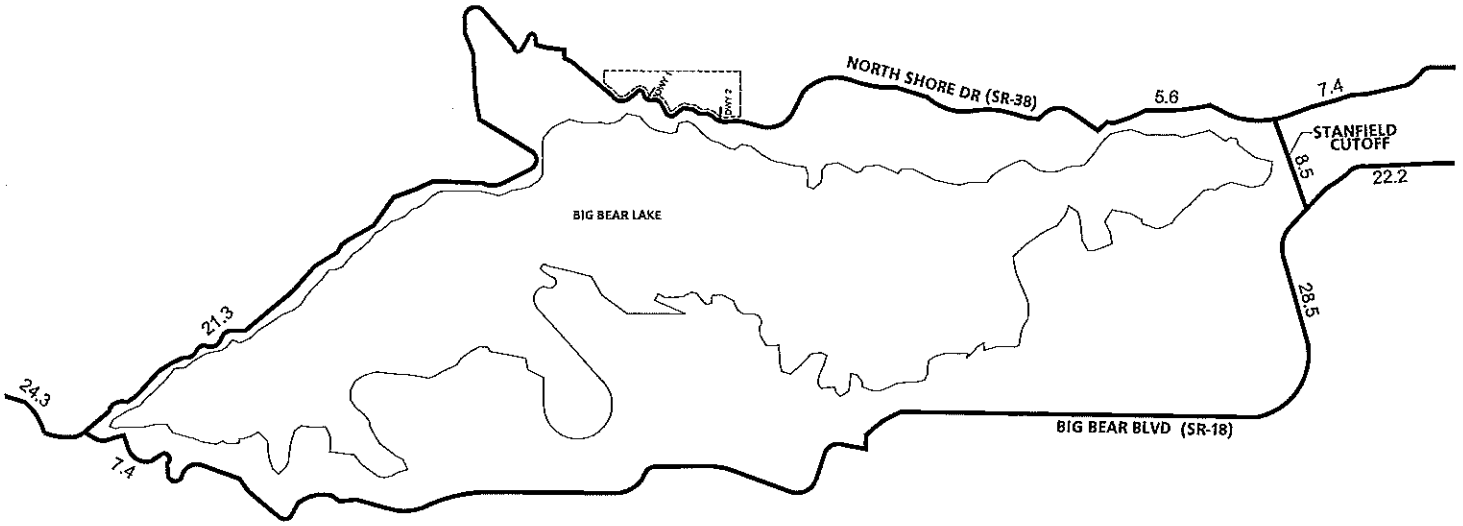
10.0 = VEHICLES PER DAY (1000'S)

N

URBAN CROSSROADS

EXHIBIT 3-C

EXISTING SUNDAY AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

URBAN CROSSROADS

Existing intersection level of service calculations are based upon the adjusted manual Friday PM and Sunday Mid-day peak hour turning movement counts, as shown on Exhibits 3-D and 3-E.

3.3 Existing Traffic Operations

Existing peak hour traffic operations have been evaluated for both the Friday PM and Sunday Mid-day peak hours of traffic throughout the study area. The results of this analysis are summarized in Table 3-1, along with the existing intersection geometrics and control devices at each analysis location. As indicated in Table 3-1, the following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday Mid-day peak hours:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

The operations analysis worksheets for existing conditions are included in Appendix "B".

Traffic signal warrant analysis (included in Appendix "C") has been conducted for existing conditions and traffic signals are currently warranted at the following study area intersections:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

EXHIBIT 3-D

EXISTING FRIDAY PM PEAK HOUR INTERSECTION VOLUMES

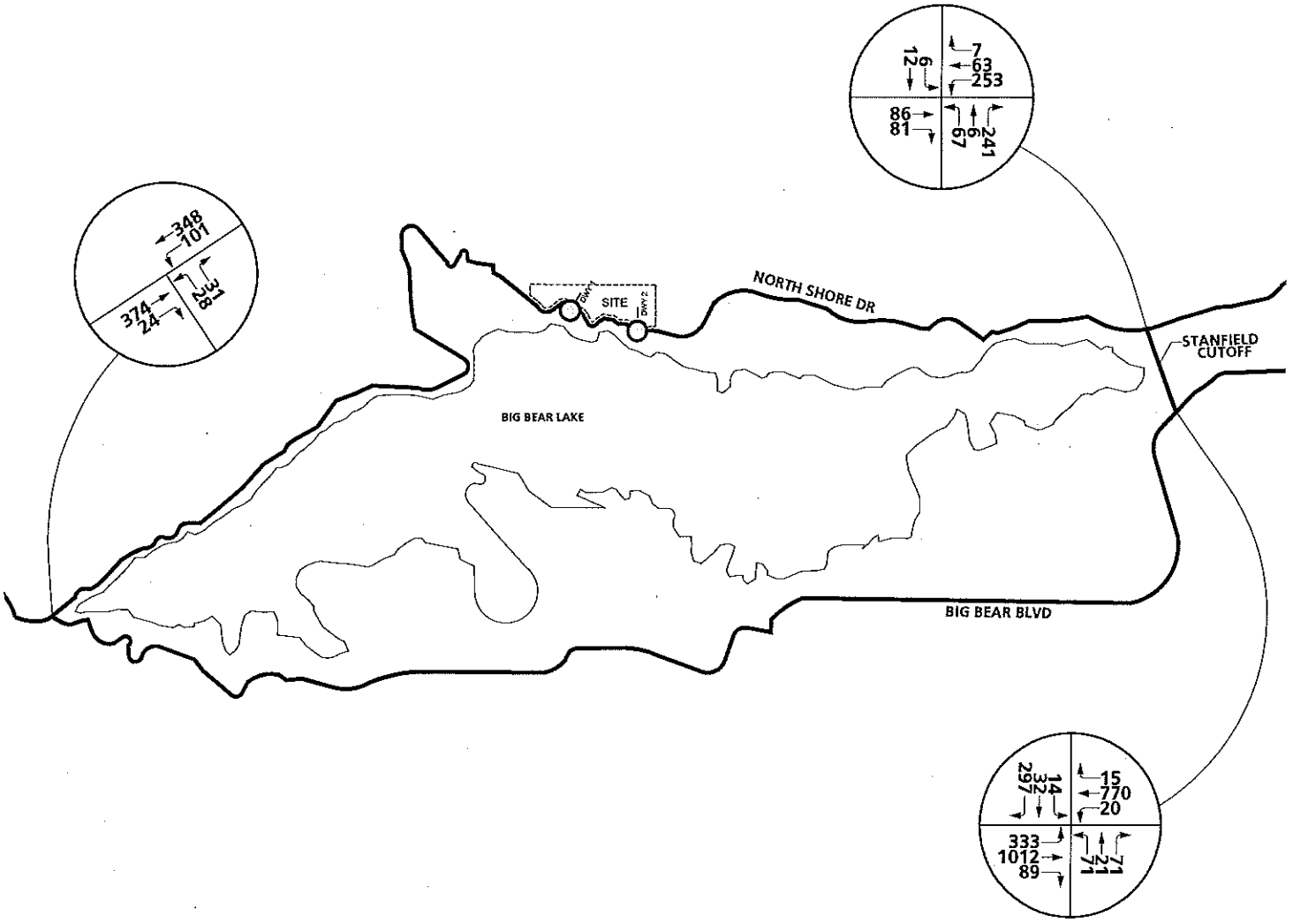
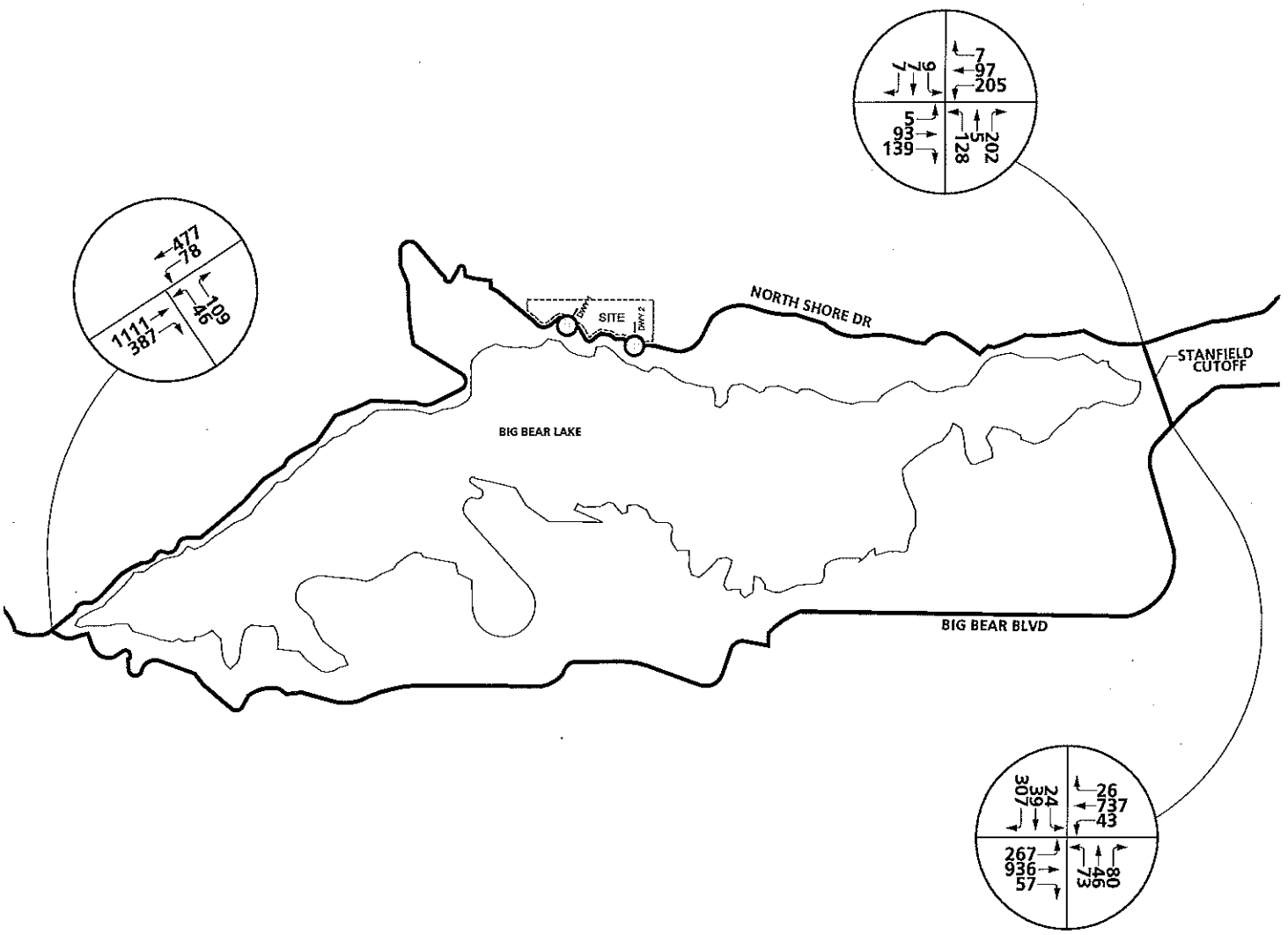


EXHIBIT 3-E

EXISTING SUNDAY MID-DAY PEAK HOUR INTERSECTION VOLUMES



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URBAN CROSSROADS

TABLE 3-1

INTERSECTION ANALYSIS FOR EXISTING CONDITIONS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	Fri. PM	Sun. MD	Fri. PM	Sun. MD
North Shore Dr. (SR-38) (NS) at:																	
• Big Bear Blvd. (SR-18) (EW)	CSS	0	1	0	0	0	0	0	1	1	1	1	0	22.5	--[4]	C	F
Stanfield Cutoff (NS) at:																	
• North Shore Dr. (SR-38) (EW)	CSS	0	1	0	0	1	0	0	1	0	0	1	0	25.5	34.5	D	D
• Big Bear Blvd. (SR-18) (EW)	TS	0	1	1	0	1	1	1	1	1	1	1	1	--[4]	81.1	F	F

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right;

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.8 R3 (2006). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross Street Stop

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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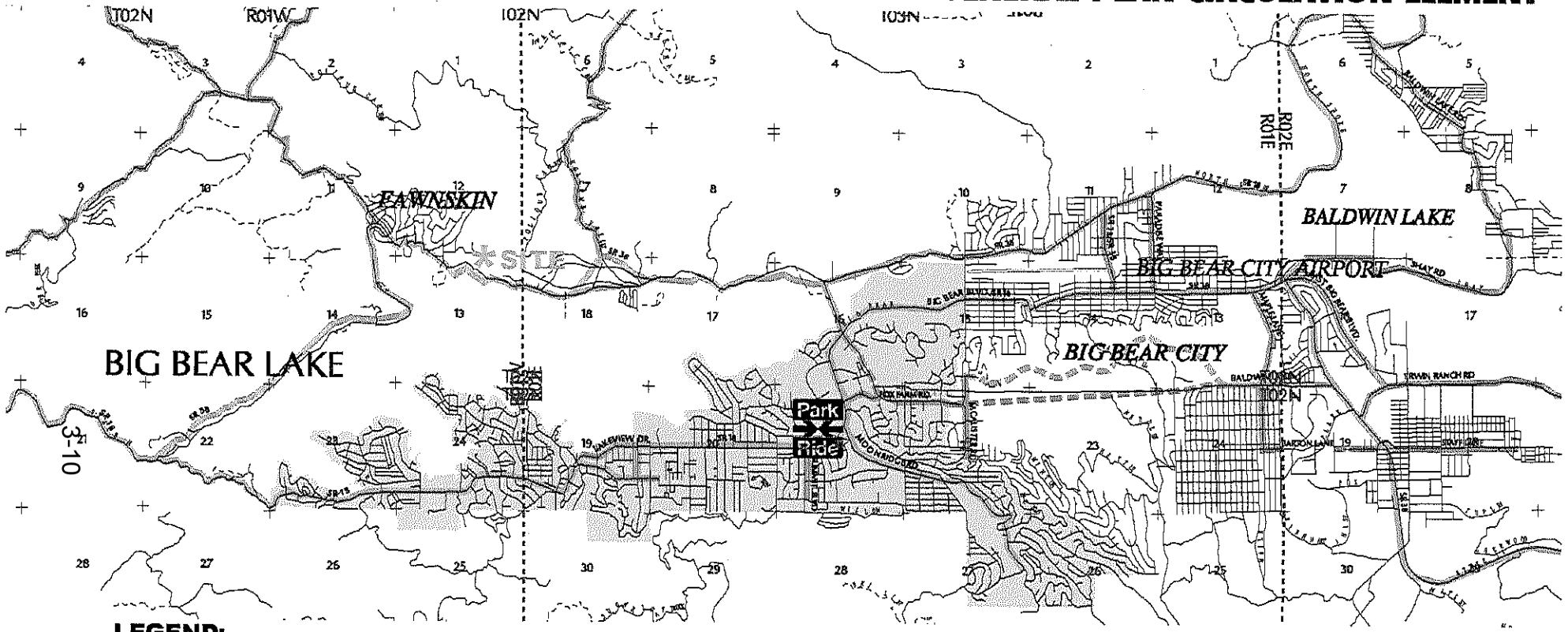
3.4 Planned Transportation Improvements and Relationships to General Plan

The long-range transportation system within the study area is expected to undergo significant improvement as a result of work to be performed by Caltrans, the County of San Bernardino, and City of Big Bear Lake. The County of San Bernardino General Plan Circulation Element and General Plan roadway cross-sections are shown on Exhibits 3-F and 3-G, respectively. The City of Big Bear Lake General Plan Circulation Element and General Plan roadway cross-sections are shown on Exhibits 3-H and 3-I, respectively.

EXHIBIT 3-F

SAN BERNARDINO COUNTY GENERAL PLAN CIRCULATION ELEMENT



LEGEND:

Circulation and Transportation

EXISTING PROPOSED

- Freeway
- Major Divided Highway
- Major Arterial Highway
- Major Highway
- Secondary Highway
- Controlled/Limited Access Collector
- Mountain Major Highway
- Mountain Secondary Highway
- State Highway (Special Standards or Conditions)
- Railroads
- Park Ride Ridesharing Facilities

Airport Runways

Runway location

Map data compiled on 7 and 1/2 and 1 rangle maps by J. J. VanHouton and A

Positional accuracy of map data is a 750 feet

Jurisdictional Control

Private Unincorporated Lands

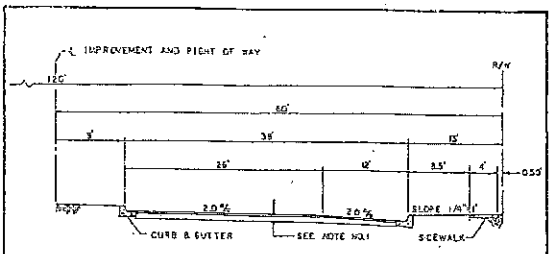
- Bureau of Land Management
- National Parks and Monuments, National Forests and Wildlife Refuges
- Military Reservations (Includes U.S. Army, Navy, Air Force, and Army, Corps of Engineers)
- State, County, and Municipal Lands
- Indian Lands and Reservations
- Unclassed Water Body
- Incorporated Cities

N

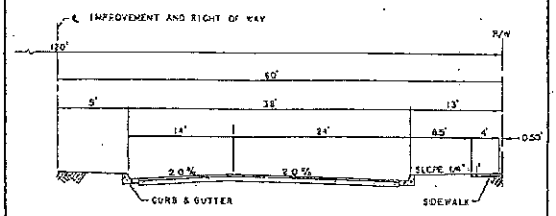
URBAN CROSSROADS

EXHIBIT 3-G

SAN BERNARDINO COUNTY GENERAL PLAN ROADWAY CROSS-SECTIONS (PAGE 1 OF 2)



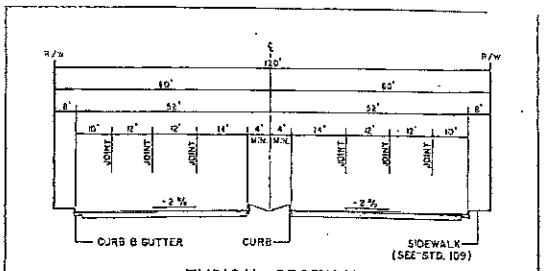
TYPICAL HALF SECTION



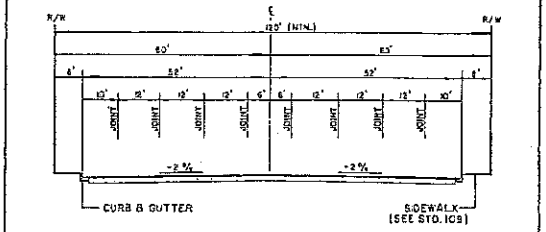
TYPICAL HALF SECTION

NOTES:
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. CONSTRUCTION OUTSIDE R/W LINE SHALL REQUIRE SLOPE EASEMENTS.

SAN BERNARDINO COUNTY ROAD DEPARTMENT		
KEN A. MILLER Director of Transportation	MAJOR DIVIDED HIGHWAY	100



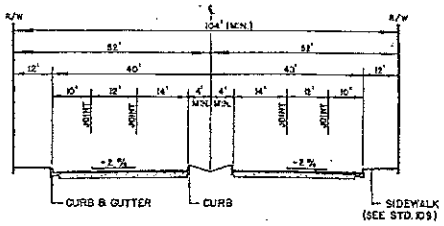
TYPICAL SECTION
WITH RAISED MEDIAN



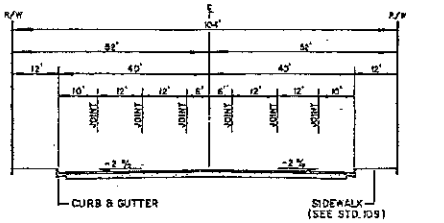
TYPICAL SECTION
WITH CONTINUOUS LEFT TURN LANE

NOTES:
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. DRAINAGE FACILITIES SHALL BE PROVIDED TO DEWATER RAISED MEDIAN AREAS.
3. 10' SHOULDER AREAS MAY BE DESIGNATED AS A BIKE LANE AND EMERGENCY PARKING ONLY.

SAN BERNARDINO COUNTY TRANSPORTATION DEPARTMENT		
JOHN R. SHONE DIRECTOR OF TRANSPORTATION	MAJOR ARTERIAL	100 A



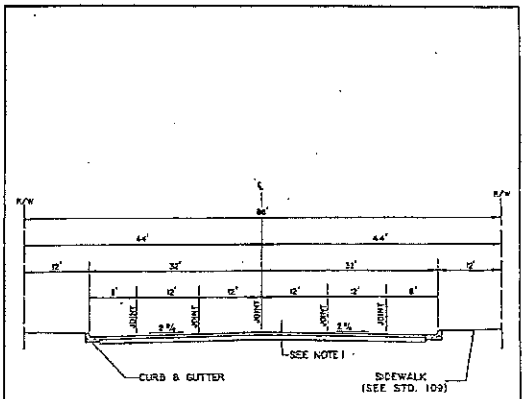
TYPICAL SECTION
WITH RAISED MEDIAN



TYPICAL SECTION
WITH CONTINUOUS LEFT TURN LANE

NOTES:
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. DRAINAGE FACILITIES SHALL BE PROVIDED TO DEWATER RAISED MEDIAN AREAS.
3. 10' SHOULDER AREAS MAY BE DESIGNATED AS A BIKE LANE AND EMERGENCY PARKING ONLY.

SAN BERNARDINO COUNTY TRANSPORTATION DEPARTMENT		
JOHN R. SHONE	MAJOR HIGHWAY	101



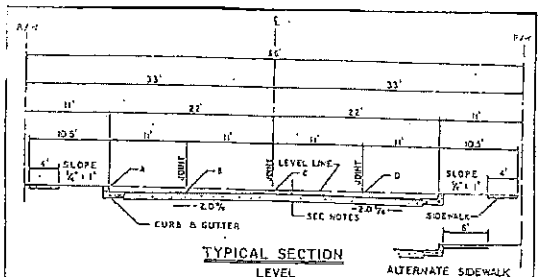
TYPICAL SECTION

NOTES:
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. 8' SHOULDER AREAS MAY BE DESIGNATED AS A BIKE LANE AND EMERGENCY PARKING ONLY.

SAN BERNARDINO COUNTY TRANSPORTATION DEPARTMENT		
JOHN R. SHONE DIRECTOR OF TRANSPORTATION	SECONDARY HIGHWAY	102

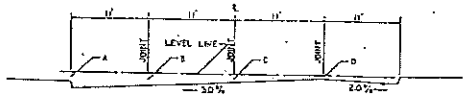
EXHIBIT 3-G

SAN BERNARDINO COUNTY GENERAL PLAN ROADWAY CROSS-SECTIONS (PAGE 2 OF 2)



TYPICAL SECTION
LEVEL

ALTERNATE SIDEWALK
(IF SHOWN ON PLAN)



TYPICAL SECTION
TILT

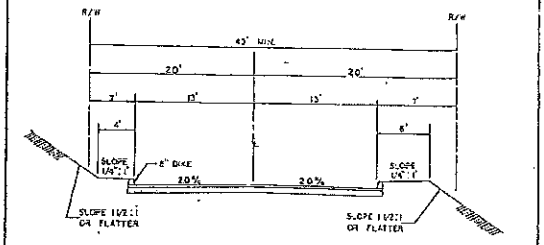
		A	B	C	D
8" CURB	LEVEL	0.00'	0.35'	0.14'	0.34'
	TILT	0.75'	1.02'	0.69'	0.35'
6" CURB	LEVEL	0.02'	0.19'	(0.03')	0.19'
	TILT	0.76'	0.85'	0.52'	0.19'

( ) INDICATES ABOVE LEVEL LINE

NOTE .
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. MINIMUM DESIGN PAVING THICKNESS SHALL BE 0.25' ASPHALT CONCRETE.
3. CONSTRUCTION OUTSIDE R/W WILL REQUIRE SLOPE EASEMENTS.

SAN BERNARDINO COUNTY TRANS. DEPT.		
	KEN A. MILLER Director of Transportation	CONTROLLED LIMITED ACCESS COLLECTOR

103 A



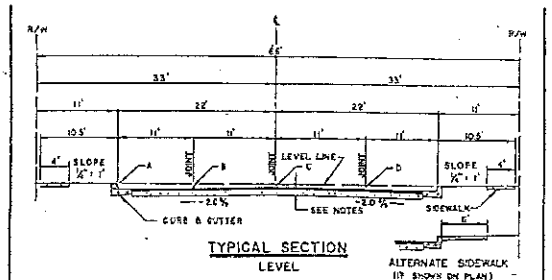
TYPICAL SECTION
MOUNTAIN AREAS

NOTES:
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. CONSTRUCTION OUTSIDE R/W LINE SHALL REQUIRE SLOPE EASEMENTS.
3. SLOPE REQUIREMENT MAY BE VARIED BY SUBMISSION OF SOILS REPORT.

SAN BERNARDINO COUNTY ROAD DEPARTMENT		
DATE 11-14-95 P.R.# 6A R.S. 1-31	KEN A. MILLER Director of Transportation	MOUNTAIN LOCAL PAVED ROAD

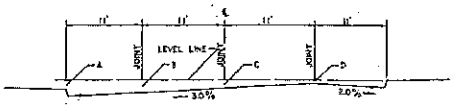
114b

3-11



TYPICAL SECTION
LEVEL

ALTERNATE SIDEWALK
(IF SHOWN ON PLAN)



TYPICAL SECTION
TILT

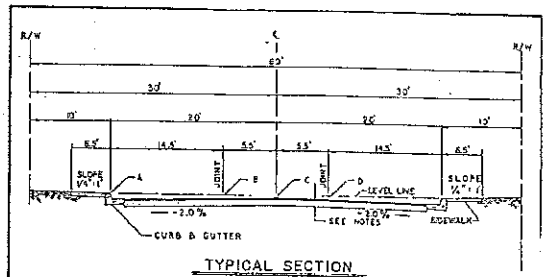
		A	B	C	D
8" CURB	LEVEL	0.00'	0.35'	0.14'	0.35'
	TILT	0.75'	1.02'	0.69'	0.36'
6" CURB	LEVEL	0.03'	0.19'	(0.03')	0.19'
	TILT	0.76'	0.85'	0.52'	0.19'

( ) INDICATES ABOVE LEVEL LINE

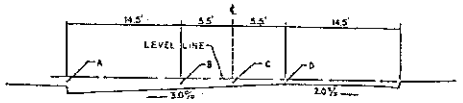
NOTE
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. MINIMUM DESIGN PAVING THICKNESS SHALL BE 0.25' ASPHALT CONCRETE.
3. CONSTRUCTION OUTSIDE R/W WILL REQUIRE SLOPE EASEMENTS.

SAN BERNARDINO COUNTY ROAD DEPARTMENT		
DATE 3-12-93 Rev. 8-96	John R. Shoaf COUNTY HIGHWAY ENGINEER	COLLECTOR STREET

103



TYPICAL SECTION
LEVEL



TYPICAL SECTION
TILT

		A	B	C	D
8" CURB	LEVEL	0.00'	0.28'	0.18'	0.29'
	TILT	0.46'	0.62'	0.46'	0.29'
6" CURB	LEVEL	0.00	0.12'	0.01'	0.28'
	TILT	0.46'	0.45'	0.29'	0.12'

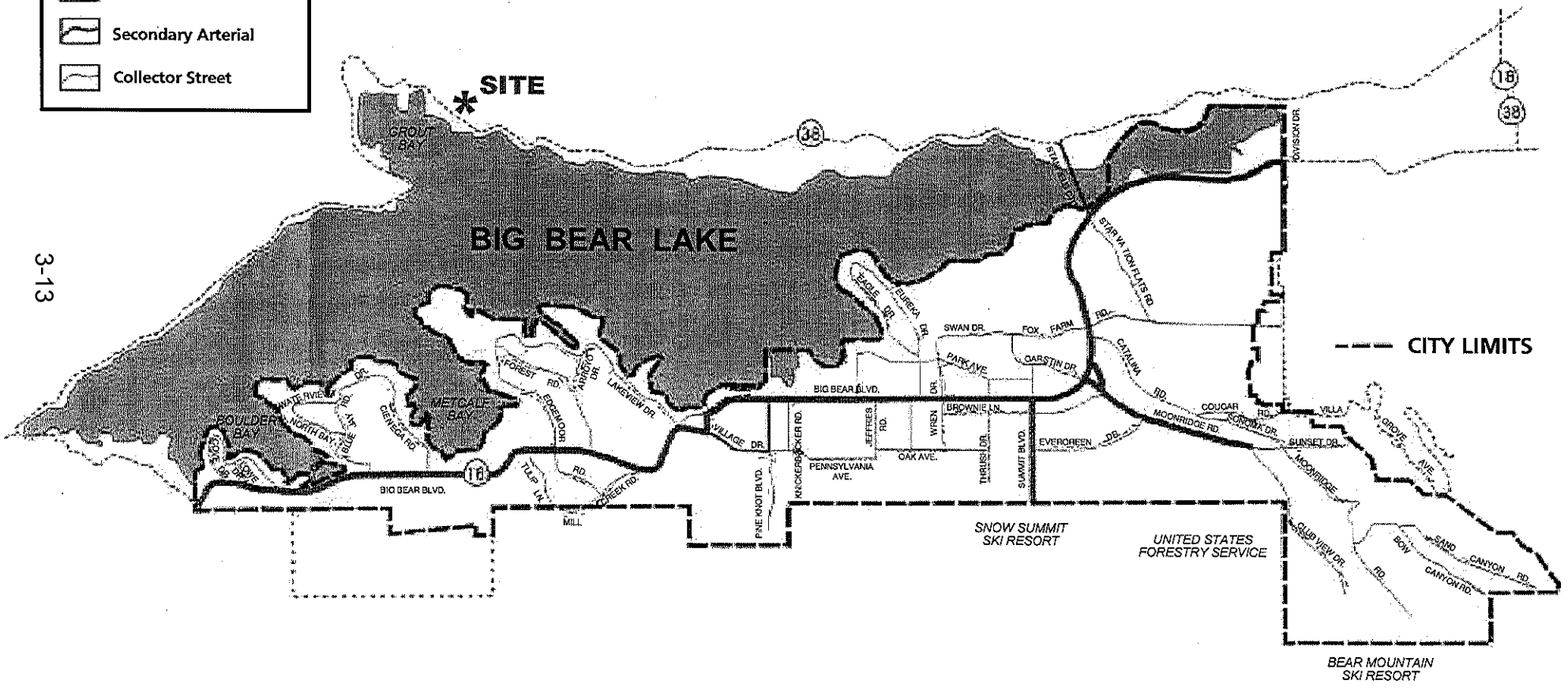
NOTE
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. MINIMUM DESIGN PAVING THICKNESS SHALL BE 0.25' ASPHALT CONCRETE.
3. CONSTRUCTION OUTSIDE R/W WILL REQUIRE SLOPE EASEMENTS
4. WHEN PREPARING SUBGRADE FOR PAVING, CENTERLINE CROWN ON THE "LEVEL SECTION" SHALL BE RELOCATED EITHER LEFT OR RIGHT 0.50' TO MATCH CROWN BREAK A PAVING MACHINE.

SAN BERNARDINO COUNTY TRANS. DEPT.		
DATE 4-6-95 Rev. 5-96 F.S. 12-95	KEN A. MILLER Director of Transportation	LOCAL STREET

104 A

EXHIBIT 3-H

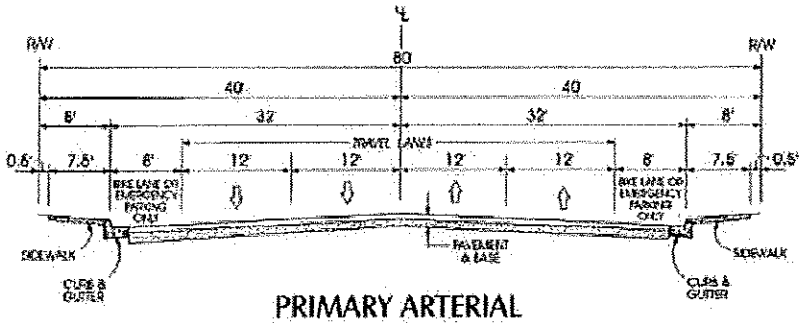
CITY OF BIG BEAR LAKE
GENERAL PLAN CIRCULATION ELEMENT



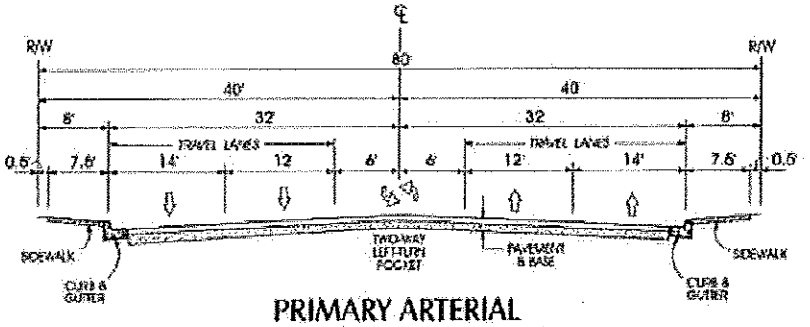
URBAN CROSSROADS

EXHIBIT 3-I

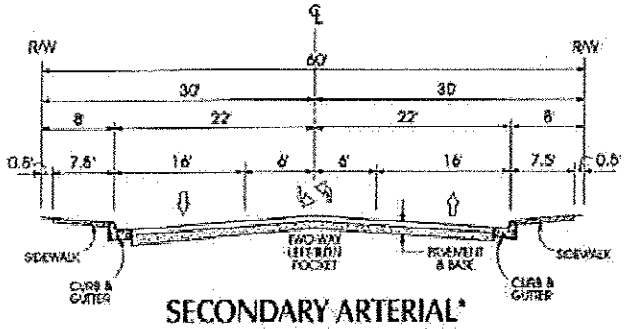
CITY OF BIG BEAR LAKE
GENERAL PLAN ROADWAY CROSS-SECTIONS
(PAGE 1 OF 2)



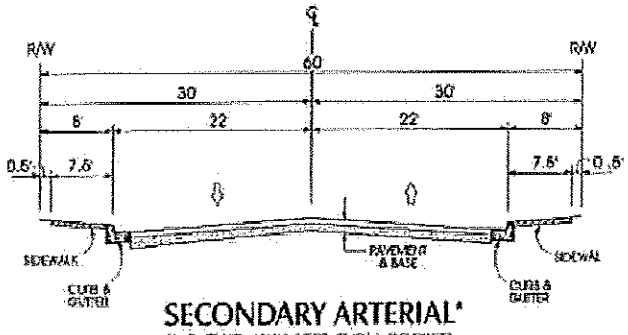
PRIMARY ARTERIAL
(WITH BIKE LANES OR EMERGENCY PARKING)
TYPICAL SECTION



PRIMARY ARTERIAL
(WITH TWO-WAY LEFT-TURN POCKET)
TYPICAL SECTION



SECONDARY ARTERIAL*
(WITH TWO-WAY LEFT-TURN POCKET)
TYPICAL SECTION

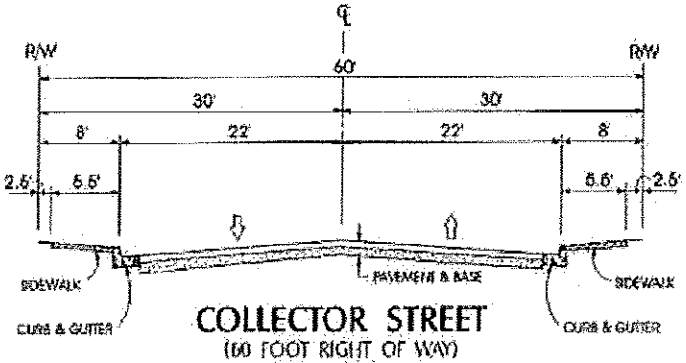


SECONDARY ARTERIAL*
(NO TWO-WAY LEFT-TURN POCKET)
TYPICAL SECTION

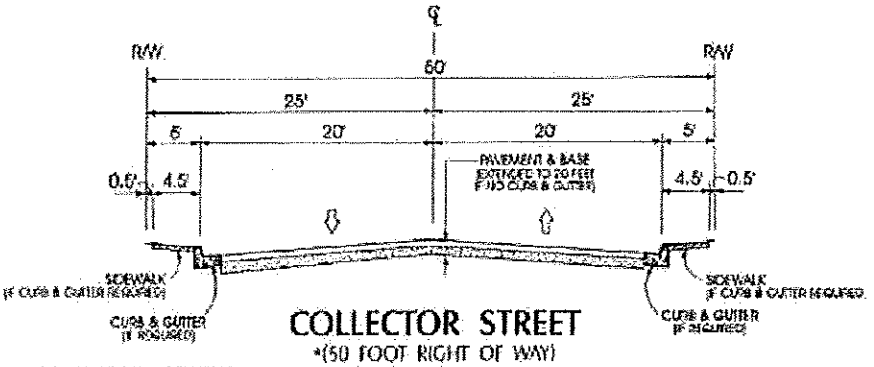
*THESE CROSS SECTIONS MAY BE MODIFIED BASED UPON ADOPTED SPECIFIC PLANS OR EXISTING CONDITIONS

EXHIBIT 3-I

CITY OF BIG BEAR LAKE
GENERAL PLAN ROADWAY CROSS-SECTIONS
(PAGE 2 OF 2)

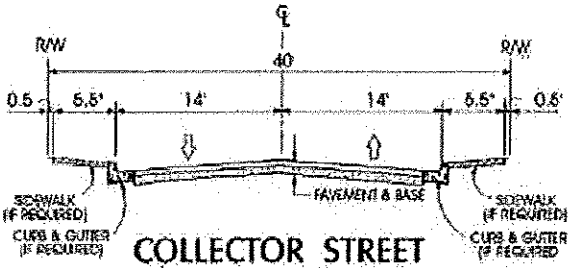


COLLECTOR STREET
(60 FOOT RIGHT OF WAY)
TYPICAL SECTION

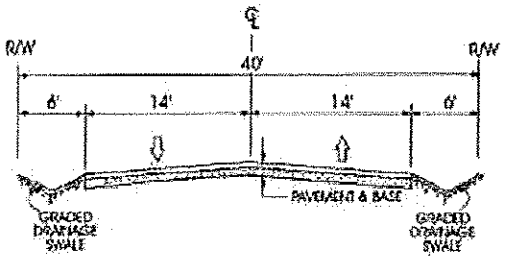


COLLECTOR STREET
*(50 FOOT RIGHT OF WAY)
TYPICAL SECTION

*ACCEPTABLE ONLY IF EXISTING DEVELOPMENT PRECLUDES A 60 FOOT RIGHT OF WAY.



COLLECTOR STREET
*(40 FOOT RIGHT OF WAY)
TYPICAL SECTION



COLLECTOR STREET
with no curb and gutter
*(40 FOOT RIGHT OF WAY)
TYPICAL SECTION

*ACCEPTABLE ONLY IF EXISTING DEVELOPMENT PRECLUDES A 60 FOOT RIGHT OF WAY.

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4.0 FUTURE DAILY TRAFFIC CONDITIONS

This chapter of the report describes the development of the future year traffic volume forecasts and presents the resulting daily traffic volumes which will be used for traffic operations analysis. Future traffic conditions without the project are presented first, followed by the future with project traffic volumes. Traffic signal warrant analysis for future conditions has also been presented in this chapter.

4.1 Future With and Without Project Traffic Conditions

Per discussion with County staff, the areawide growth has been interpolated from adjusted existing volumes (with 16% growth) to General Plan Buildout (2030) volumes. The areawide growth varies for each movement at each intersection (see Appendix "D"). The interpolated area-wide growth rate has been added to peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the project and other development.

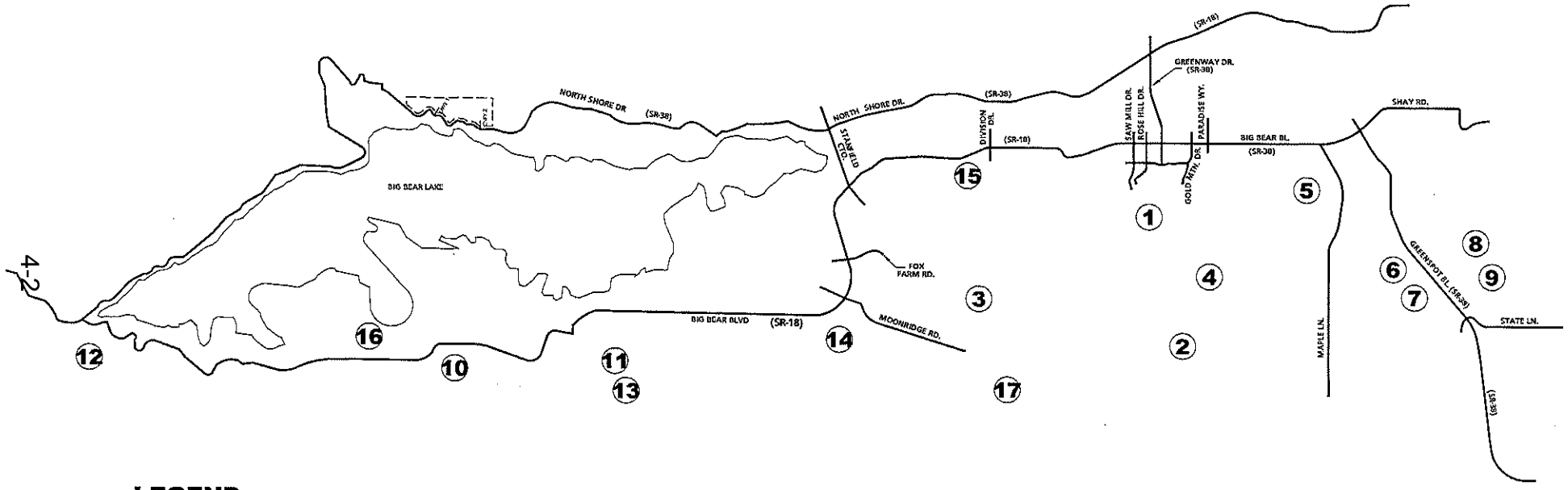
Long Range General Plan Buildout (2030) conditions have been estimated based on a select zone run of the San Bernardino Mountain Model, in addition to traffic generated by the project and the known cumulative development.

The County of San Bernardino was contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on information given by the County of San Bernardino and City of Big Bear staff, a total of 17 cumulative projects were identified to affect the study intersections. The location of each of these other developments is shown on Exhibit 4-A.

As indicated in Table 4-1, other developments are projected to generate 15,111 trip-ends per day with 1,455 vehicles per hour during the AM peak hour and 1,455 vehicles per hour during the PM peak hour. Appendix "D" contains the

EXHIBIT 4-A

OTHER DEVELOPMENT LOCATION MAP



LEGEND:

1. = TT 16771
2. = TT 16934
3. = TT 17217 & TPM 17022
4. = TT 16036
5. = TT 14916
6. = TT 16980
7. = TT 17764
8. = TT 16749
9. = TT 17201
10. = HILTON GARDEN INN
11. = MIXED USE DEVELOPMENT
12. = RESIDENTIAL LOTS
13. = CONDOMINIUMS
14. = 41820 BIG BEAR BLVD
15. = WORLD HARVEST FAITH CENTER
16. = BOAT PARTS RETAIL & SERVICE
17. = STORAGE YARD

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URBAN CROSSROADS

TABLE 4-1
FRIDAY PM PEAK HOUR/SUNDAY MIDDAY PEAK HOUR

OTHER DEVELOPMENT TRIP GENERATION

ID #	PROJECT NAME	LAND USE[1]	QUANTITY	UNITS[2]	PEAK HOUR						DAILY
					FRIDAY PM			SUNDAY MIDDAY			
					IN	OUT	TOTAL	IN	OUT	TOTAL	
SAN BERNARDINO COUNTY											
1	TT 16771 [3]	SFR	242	DU	155	90	245	155	90	245	2,316
2	TT 16934 [4]	SFR	228	DU	146	84	230	146	84	230	2,182
3	TT 17217 & TT 17022 [4]	SFR	53	DU	34	20	54	34	20	54	507
4	TT 16036	SFR	116	DU	74	43	117	74	43	117	1,110
5	TT 14916	SFR	51	DU	33	19	52	33	19	52	488
6	TT 16980	SFR	15	DU	10	6	16	10	6	16	144
7	TT 1776H	SFR	10	DU	6	4	10	6	4	10	96
8	TT 16749	SFR	86	DU	55	32	87	55	32	87	823
9	TT 17201	SFR	66	DU	42	24	66	42	24	66	632
	TOTAL (COUNTY OF SAN BERNARDINO)				555	322	877	555	322	877	8,298
CITY OF BIG BEAR											
10	Hilton Garden Inn	Hotel	91	ROOMS	28	25	53	28	25	53	743
11	Mixed Use Development	Retail	22.5	TSF	112	122	234	112	122	234	2,575
		Less Pass-By (15%)			-17	-18	-35	-17	-18	-35	-386
		Subtotal Commercial			95	104	199	95	104	199	2,189
		Office	6.3	TSF	1	5	6	1	5	6	69
		SFR	10	DU	6	4	10	6	4	10	96
	Sub-Total				102	113	215	102	113	215	2,354
12	Residential Lots	SFR	8	DU	5	3	8	5	3	8	77
13	Condominiums	MFDU	78	DU	27	13	40	27	13	40	457
14	41820 Big Bear Blvd.	Hotel	55	ROOMS	17	15	32	17	15	32	449
		Retail	10	TSF	66	71	137	66	71	137	1,520
		Fast-Food	2.5	TSF	45	42	87	45	42	87	1,240
		Less Pass-By (15%)			-17	-17	-34	-17	-17	-34	-414
		Subtotal Commercial			94	96	190	94	96	190	2,346
	Sub-Total				111	111	222	111	111	222	2,795
15	World Harvest Faith Center	Church	20	TSF	7	6	13	7	6	13	182
16	Boat Parts Retail & Service	Auto Care Center	4.375	TSF	7	7	14	7	7	14	88
17	Storage Yard	Mini Warehouse	3	AC	6	6	12	6	6	12	117
	TOTAL (CITY OF BIG BEAR)				294	284	578	294	284	578	6,813
	TOTAL				**849**	**606**	**1,455**	**849**	**606**	**1,455**	**15,111**

[1] SFR = Single Family Residential
[2] DU = Dwelling Unit
TSF= Thousand Square Feet
AC = Acres

[3] Source: TT 16771 Traffic Impact Analysis, County of San Bernardino, Urban Crossroads, Inc. July 2006

[4] Source: TT 17217 and TT 17022 Traffic Impact Analysis, County of San Bernardino, Urban Crossroads, Inc. July 2006

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directional distribution and assignment of the other development traffic. Based on the identified trip distribution for the other development on arterial highways throughout the study area, other development average daily traffic (ADT) and Friday PM/Sunday Mid-day peak hour intersection turning movement volumes (based on PM peak hour trip generation) are shown on Exhibits 4-B and 4-C, respectively.

Project traffic volumes on study area roadway segments are determined by generating project trips and manually routing the traffic through the roadway network. The routing patterns follow the trip distributions which were previously presented in Section 2. Trips are assigned to each individual roadway link and intersection occurring along a specific route.

The accumulation of traffic assigned to each roadway link represents the project traffic volume for that link. Project only ADT volumes were previously presented in Section 2.

4.1.1 2010 Without Project Daily Traffic Volumes

The ADT's for 2010 Without Project traffic conditions have been determined by adding the 2007 existing traffic volumes (with 16% adjustment) plus the 2% background growth volumes per year (6% for three years) plus the known cumulative development volumes. 2010 Friday ADT and Sunday ADT volumes for without project traffic conditions are shown on Exhibit 4-D and 4-E, respectively.

For 2010 Without Project traffic conditions, no new traffic signals are projected to be warranted (see Appendix "C"), compared to Existing Conditions.

EXHIBIT 4-B

OTHER DEVELOPMENT AVERAGE DAILY TRAFFIC

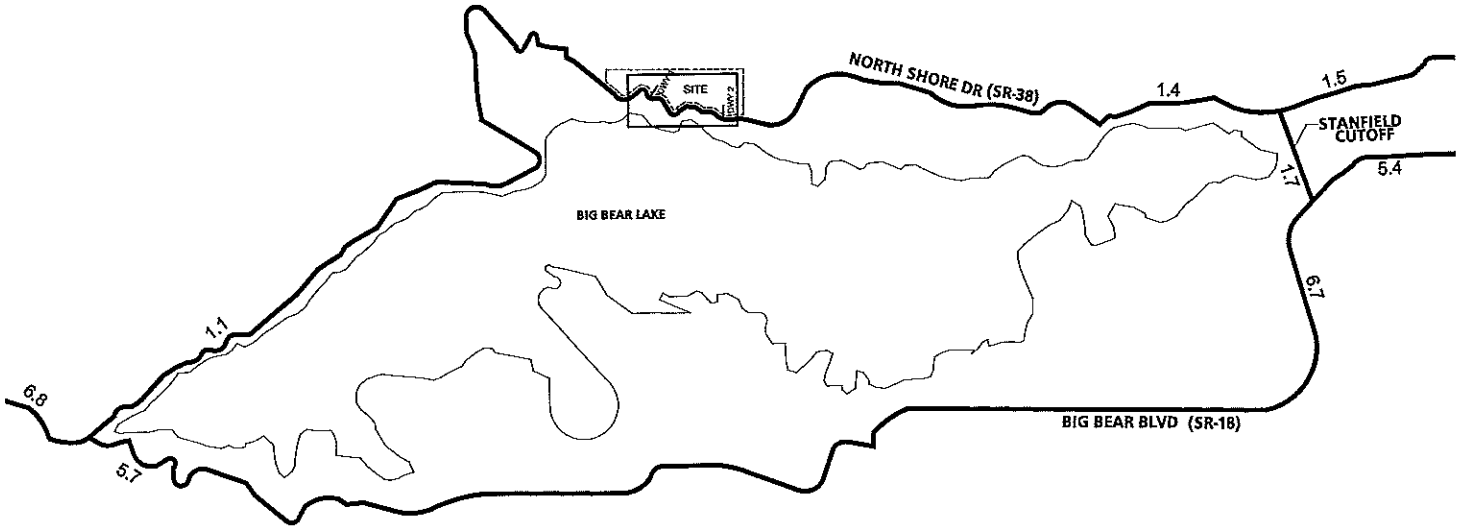
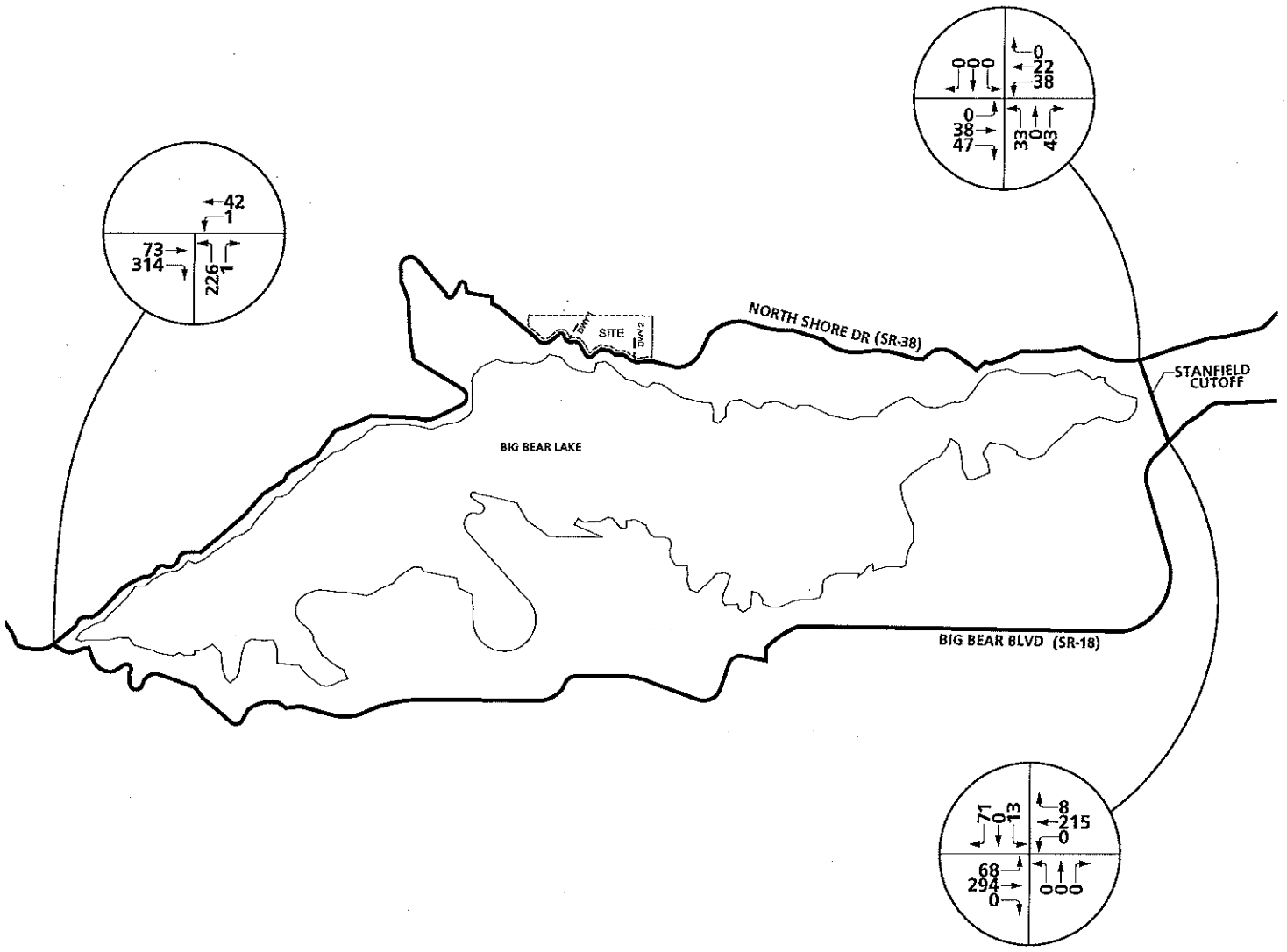


EXHIBIT 4-C

OTHER DEVELOPMENT FRIDAY PM PEAK HOUR/ SUNDAY MIDDAY PEAK HOUR INSTERSECTION VOLUMES



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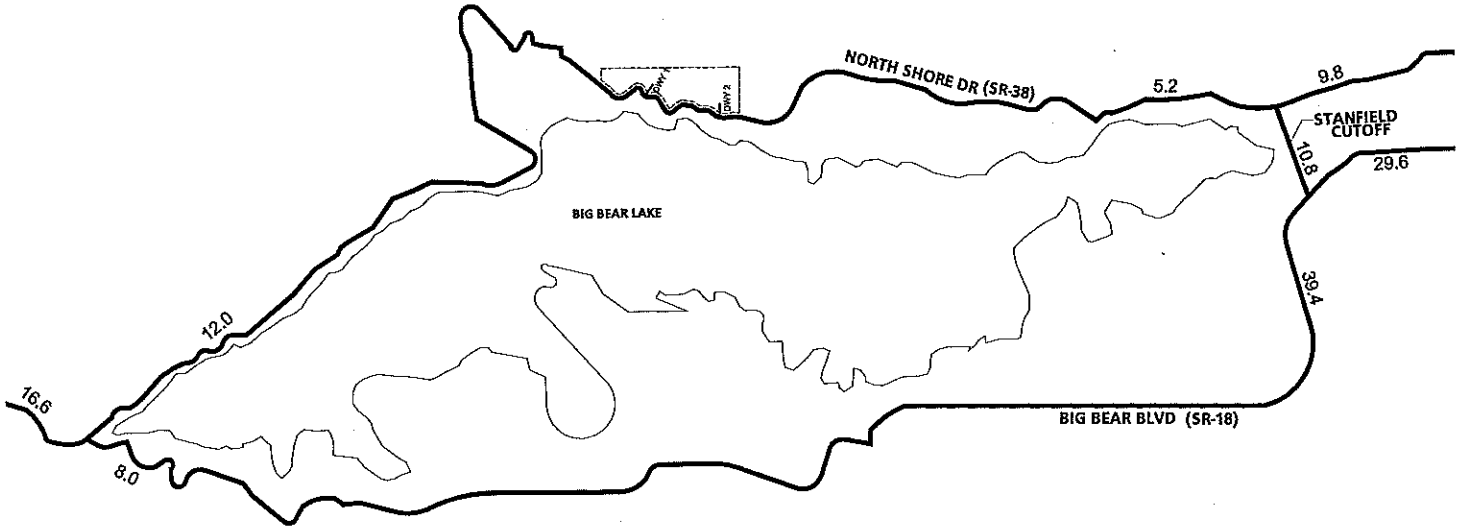
URBAN CROSSROADS

EXHIBIT 4-D

2010 WITHOUT PROJECT FRIDAY AVERAGE DAILY TRAFFIC



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

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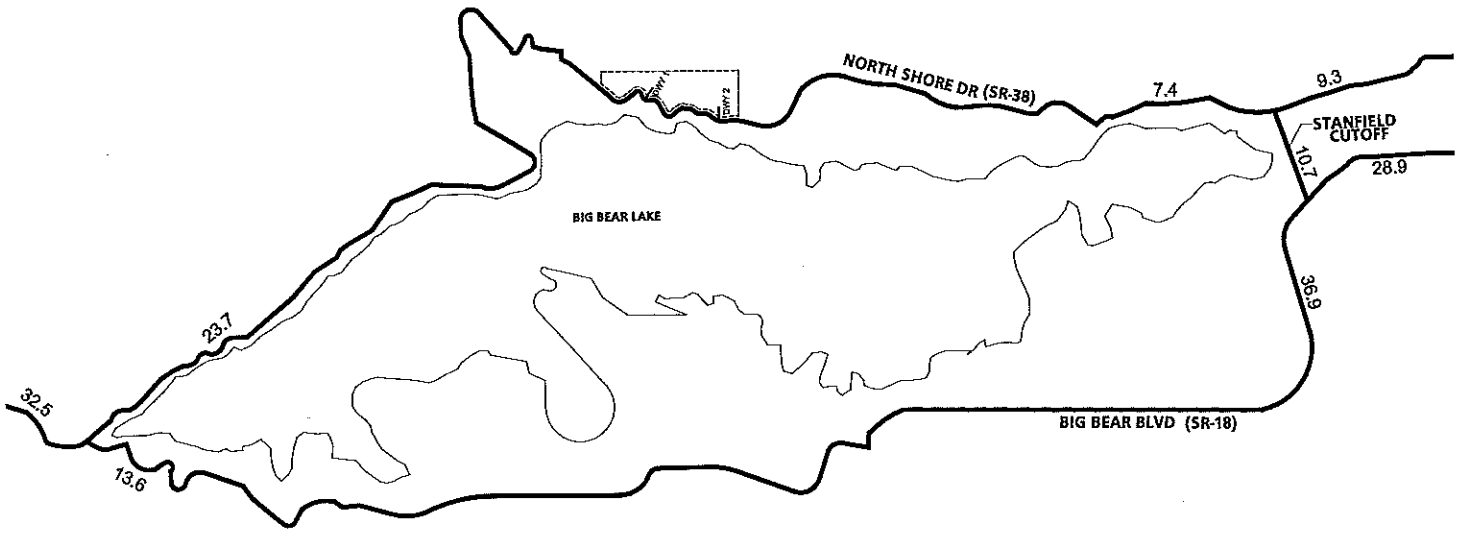
URBAN CROSSROADS

EXHIBIT 4-E

2010 WITHOUT PROJECT SUNDAY AVERAGE DAILY TRAFFIC



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

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URBAN CROSSROADS

4.1.2 2010 With Project Daily Traffic Volumes

The ADT's for the 2010 With Project have been determined by adding the project only traffic volumes to the 2010 Without Project traffic volumes. 2010 Friday and Sunday ADT volumes with the project traffic are shown on Exhibit 4-F and 4-G, respectively.

For 2010 With Project traffic conditions, no new traffic signals are projected to be warranted (see Appendix "C"), as compared to 2010 Without Project conditions.

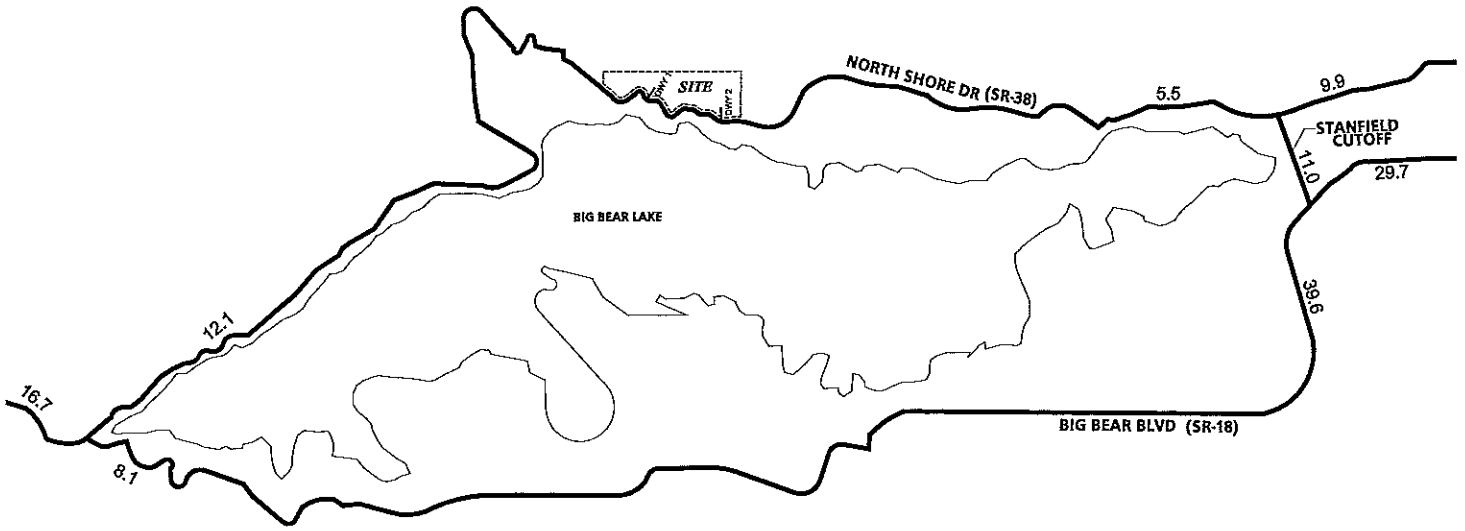
4.1.3 General Plan Buildout (2030) Daily Traffic Volumes

The ADT's for General Plan Buildout (2030) conditions have been determined by adding the project only and other cumulative development traffic volumes to the 2030 ADT volumes derived from the San Bernardino Mountain Model. General Plan Buildout Without Project (2030) Winter Friday and Sunday ADT volumes are shown on Exhibits 4-H and 4-I, respectively. Based on the San Bernardino Mountain Model for General Plan Buildout (2030), the peak season is shown to be winter. Therefore, the winter ADT results were used for post-processing peak hour turning volumes and level of service analysis to achieve a conservative analysis. General Plan Buildout With Project (2030) Winter Friday and Sunday ADT volumes are shown on Exhibits 4-J and 4-K, respectively.

For General Plan Buildout With Project (2030) traffic conditions, no new traffic signals are projected to be warranted (see Appendix "C") at study area analysis intersections.

EXHIBIT 4-F

2010 WITH PROJECT FRIDAY AVERAGE DAILY AVERAGE TRAFFIC



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

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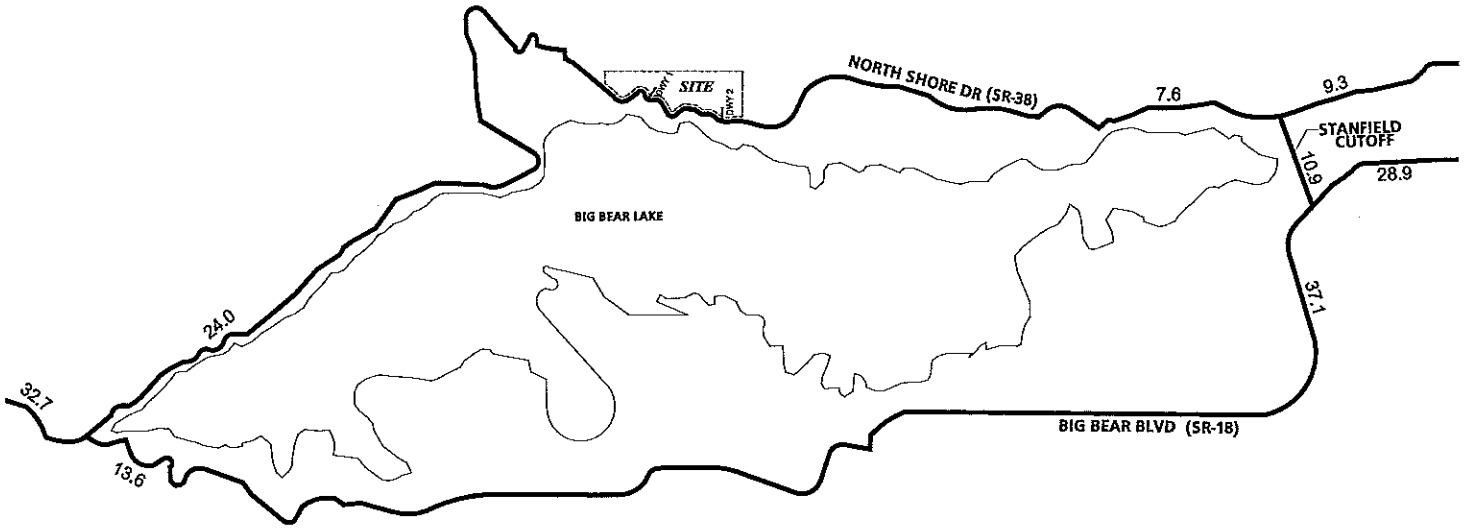
URBAN CROSSROADS

EXHIBIT 4-G

2010 WITH PROJECT SUNDAY AVERAGE DAILY TRAFFIC



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

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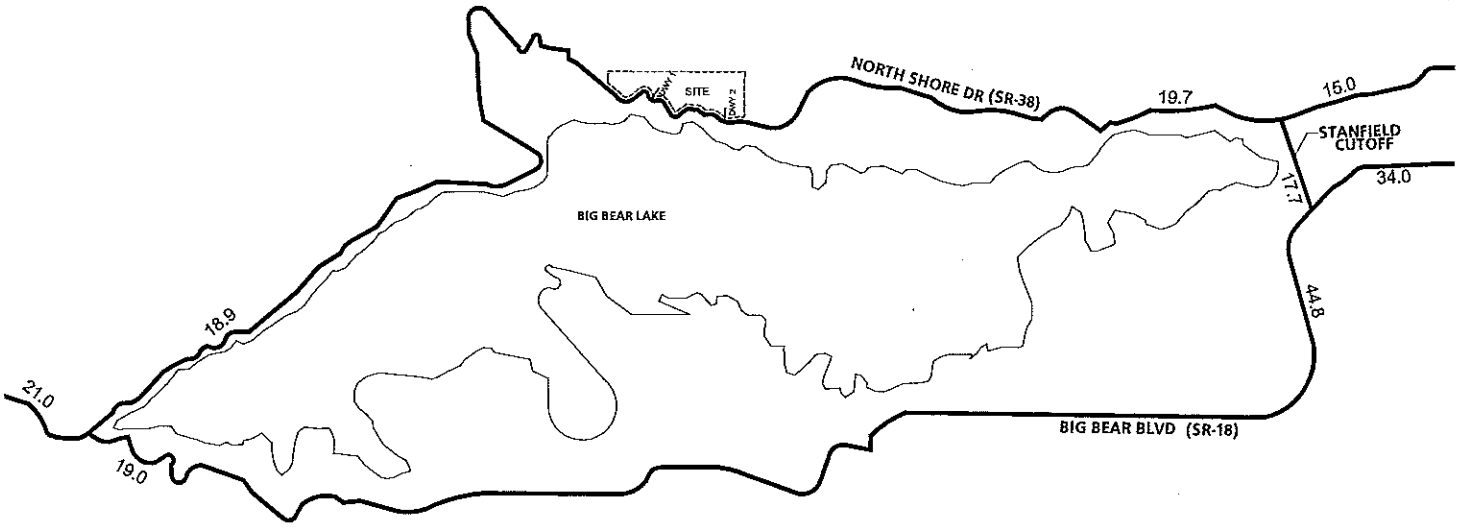
URBAN CROSSROADS

EXHIBIT 4-H

GENERAL PLAN BUILDOUT (2030) WINTER FRIDAY AVERAGE DAILY TRAFFIC



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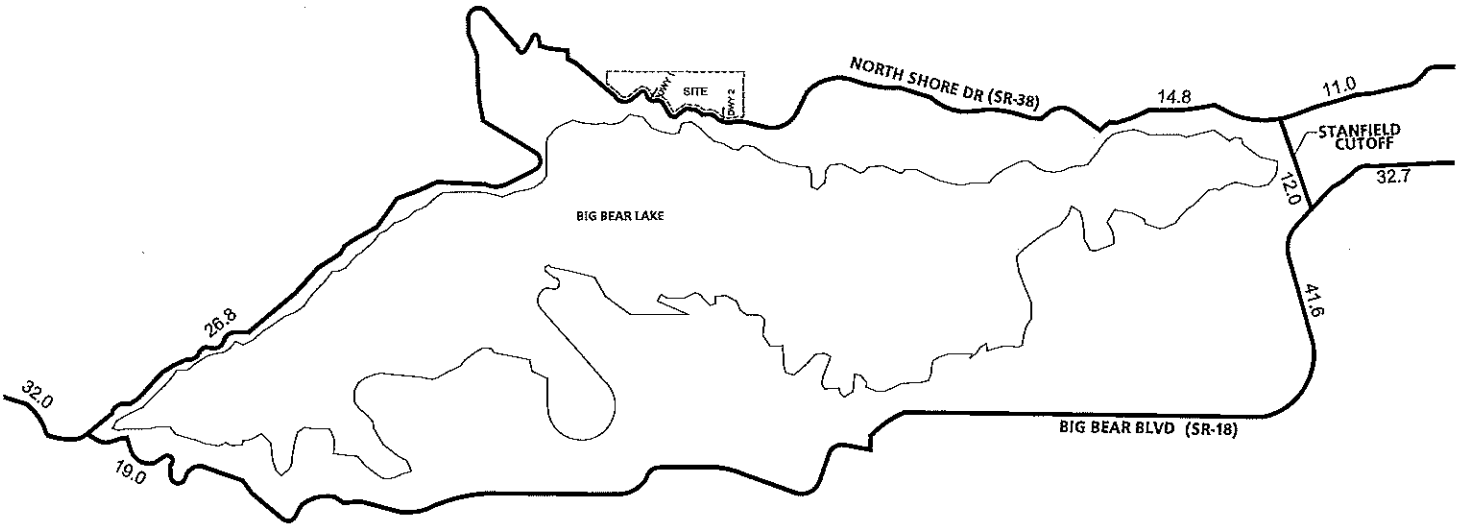
URBAN CROSSROADS

EXHIBIT 4-I

GENERAL PLAN BUILDOUT (2030) WINTER SUNDAY AVERAGE DAILY TRAFFIC (ADT)



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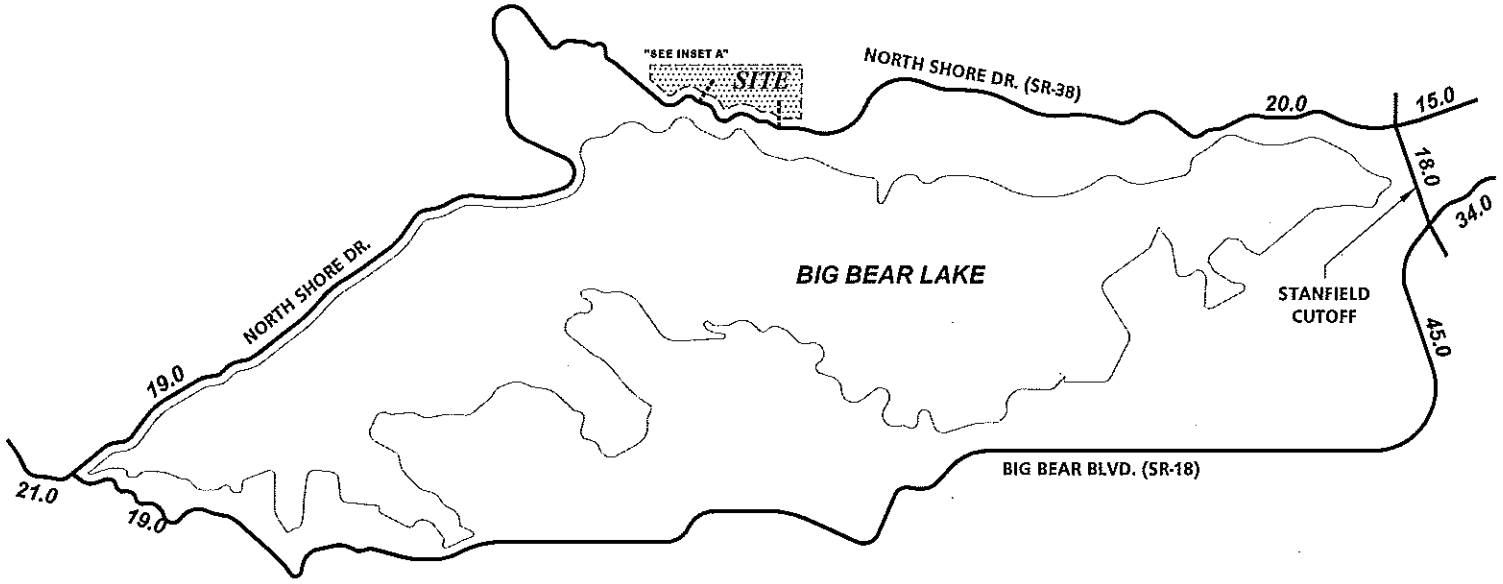
URBAN CROSSROADS

EXHIBIT 4-J

GENERAL PLAN BUILDOUT WITH PROJECT (2030) WINTER FRIDAY AVERAGE DAILY TRAFFIC



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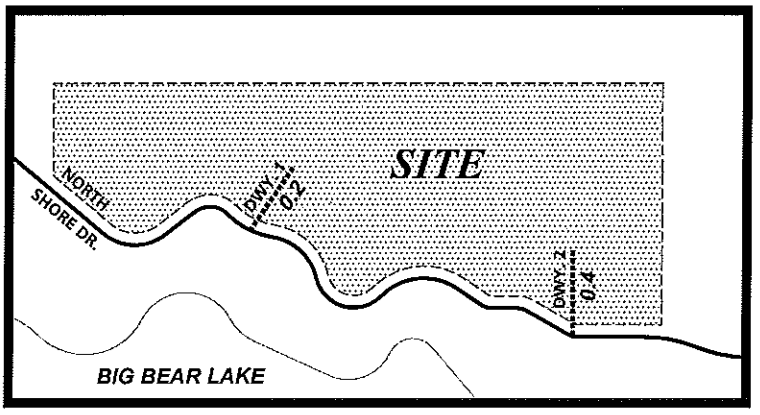

LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

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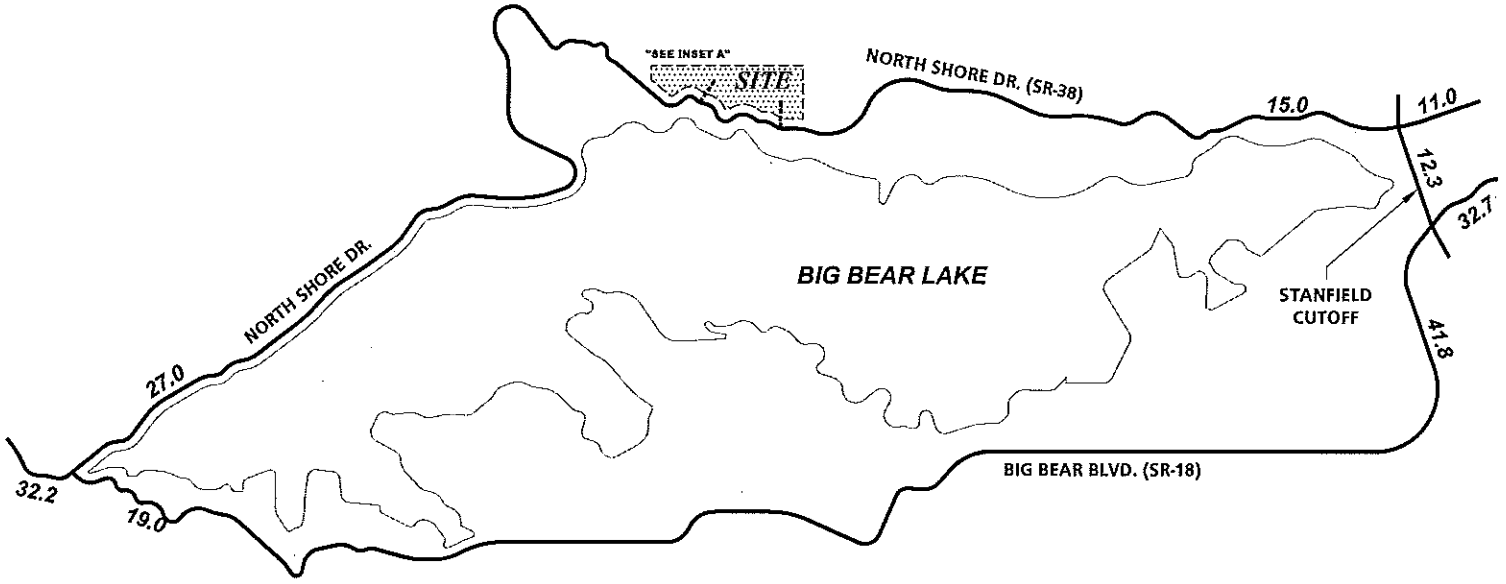
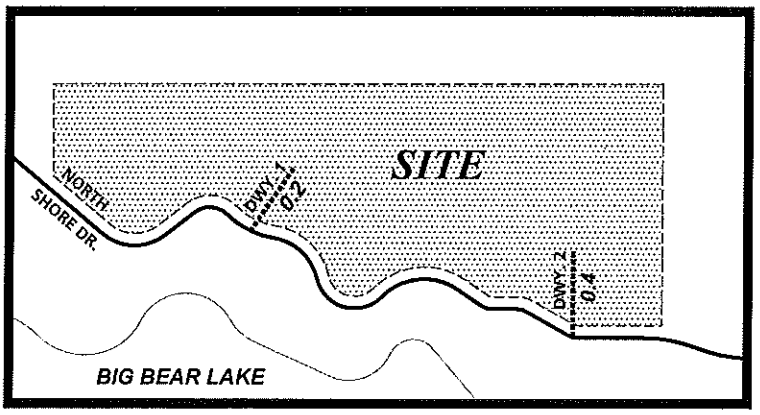
EXHIBIT 4-K

GENERAL PLAN BUILDOUT WITH PROJECT (2030) WINTER SUNDAY AVERAGE DAILY TRAFFIC



INSET A



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

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5.0 FUTURE TRAFFIC OPERATIONS ANALYSIS

This section of the report presents the operations analysis for the traffic volume forecasts for future traffic conditions without the project and for future traffic conditions with the project. The analysis procedures conform to the requirements of the County of San Bernardino CMP. The operations analysis for each analysis year is presented in a separate subsection.

5.1 Future Interim Year Traffic Operations

5.1.1 2010 Without Project Conditions

The intersection operations analysis for 2010 Without Project traffic conditions are summarized in Table 5-1, based on the geometrics analysis at the study area intersections, without and with improvements. 2010 Without Project Friday PM and Sunday Mid-day peak hour intersection turning movement volumes are shown on Exhibits 5-A and 5-B, respectively. As shown in Table 5-1, the following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday Mid-day peak hours:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

The operations analysis worksheets for 2010 Without Project conditions are included in Appendix "E".

TABLE 5-1

INTERSECTION ANALYSIS FOR 2010 WITHOUT PROJECT CONDITIONS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	Fri. PM	Sun. MD	Fri. PM	Sun. MD
North Shore Dr. (SR-38) (NS) at:																	
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	CSS	0	1	0	0	0	0	0	1	1	1	1	0	--[4]	--[4]	F	F
- With Improvements	**TS**	**1**	0	1	0	0	0	0	**2**	1	1	1	0	14.0	21.2	B	C
Stanfield Cutoff (NS) at:																	
• North Shore Dr. (SR-38) (EW)																	
- Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	--[4]	--[4]	F	F
- With Improvements	**TS**	**1**	1	0	**1**	1	0	**1**	1	0	**1**	1	0	31.9	30.7	C	C
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	TS	0	1	1	0	1	1	1	1	1	1	1	1	--[4]	--[4]	F	F
- With Improvements	TS	**1**	1	0	**1**	1	0	1	**2**	0	1	**2**	0	31.4	26.8	C	C

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.8 R3 (2006). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross Street Stop
AWS = All Way Stop

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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EXHIBIT 5-A

2010 WITHOUT PROJECT FRIDAY PM PEAK HOUR INTERSECTION VOLUMES

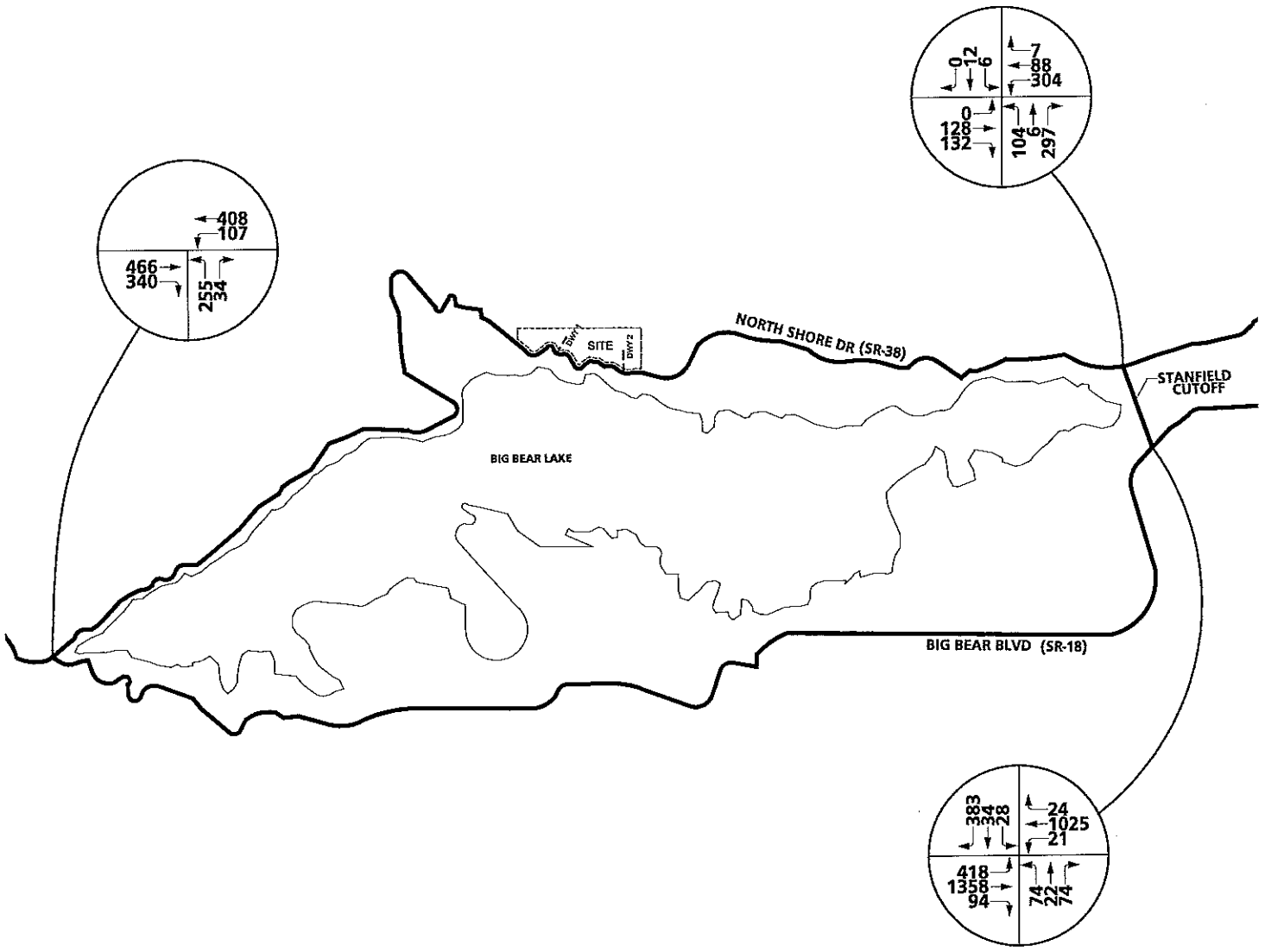
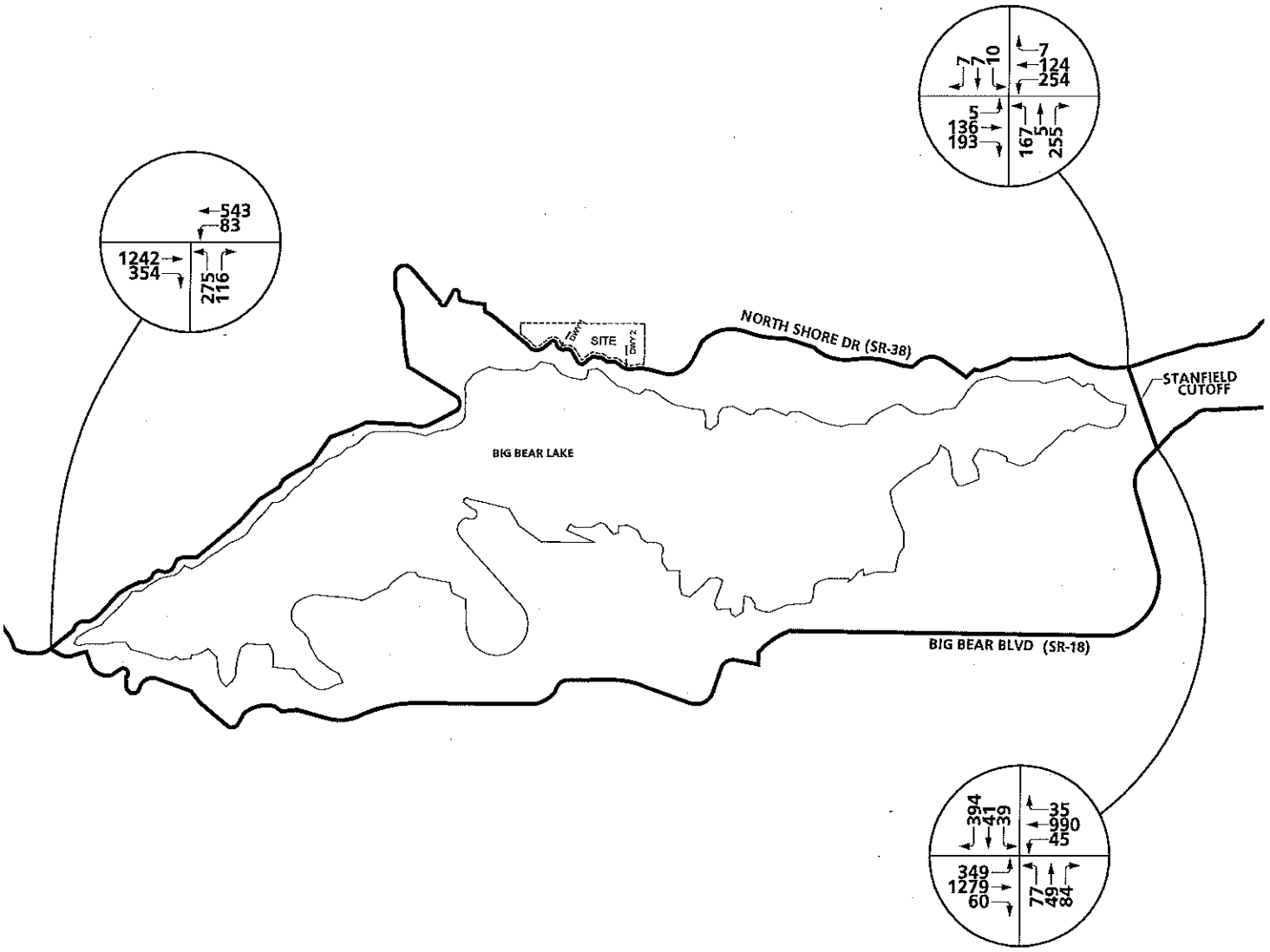


EXHIBIT 5-B

2010 WITHOUT PROJECT SUNDAY MID-DAY PEAK HOUR INTERSECTION VOLUMES



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URBAN CROSSROADS

5.1.2 2010 With Project Conditions

The intersection operations analysis for 2010 With Project traffic conditions are summarized in Table 5-2, based on the geometrics analysis at the study area intersections, without and with improvements. 2010 With Project Friday PM and Sunday Mid-day peak hour intersection turning movement volumes are shown on Exhibits 5-C and 5-D, respectively. As shown in Table 5-2, the following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday Mid-day peak hours:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

The operations analysis worksheets for 2010 With Project conditions are included in Appendix "F".

5.2 General Plan Buildout With Project (2030) Traffic Operations

The intersection operations analysis for General Plan Buildout With Project (2030) traffic conditions are summarized in Table 5-3, based on the geometrics analysis at the study area intersections, without and with improvements. General Plan Buildout With Project (2030) Friday PM and Sunday Mid-day peak hour intersection turning movement volumes are shown on Exhibits 5-E and 5-F, respectively. The General Plan Buildout post-processed volumes worksheets are provided in Appendix "G". As shown in Table 5-3, the following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday Mid-day peak hours:

TABLE 5-2

INTERSECTION ANALYSIS FOR 2010 WITH PROJECT CONDITIONS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	Fri. PM	Sun. MD	Fri. PM	Sun. MD
North Shore Dr. (SR-38) (NS) at:																	
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	CSS	0	1	0	0	0	0	0	1	1	1	1	0	--[4]	--[4]	F	F
- With Improvements	**TS**	**1**	0	1	0	0	0	0	**2**	1	1	1	0	14.0	22.1	B	C
Stanfield Cutoff (NS) at:																	
• North Shore Dr. (SR-38) (EW)																	
- Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	--[4]	--[4]	F	F
- With Improvements	**TS**	**1**	1	0	**1**	1	0	**1**	1	0	**1**	1	0	32.4	31.5	C	C
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	TS	0	1	1	0	1	1	1	1	1	1	1	1	--[4]	--[4]	F	F
- With Improvements	TS	**1**	1	0	**1**	1	0	1	**2**	0	1	**2**	0	32.5	27.6	C	C
Driveway # 1 (NS) at:																	
• North Shore Dr. (SR-38) (EW)	CSS	0	0	0	0	**1**	0	0	1	0	0	1	0	11.1	12.0	B	B
Driveway # 2 (NS) at:																	
• North Shore Dr. (SR-38) (EW)	CSS	0	0	0	0	**1**	0	0	1	0	0	1	0	11.2	12.1	B	B

---

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.8 R3 (2006). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross Street Stop
AWS = All Way Stop

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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EXHIBIT 5-C

2010 WITH PROJECT FRIDAY PM PEAK INTERSECTION VOLUMES

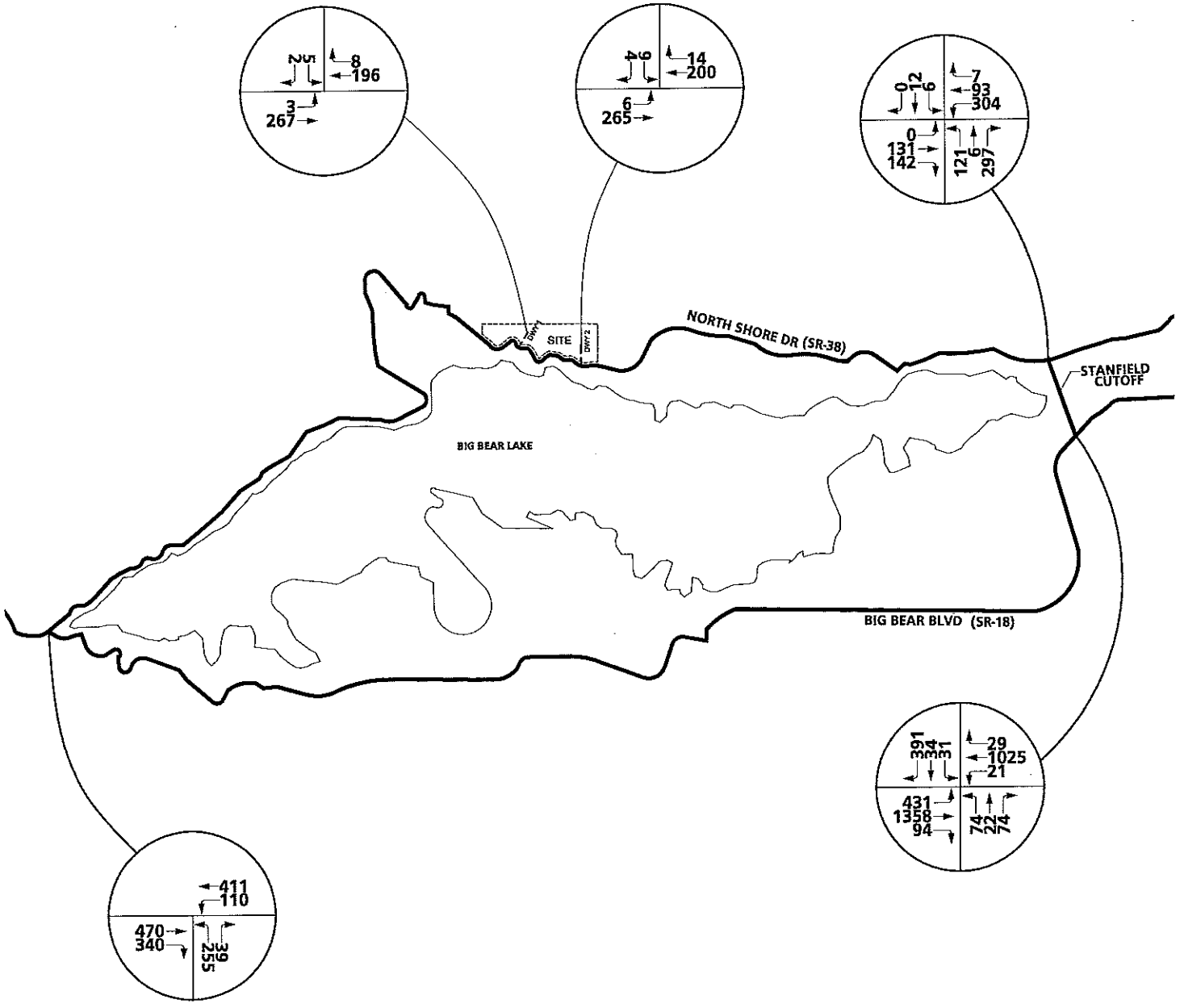

EXHIBIT 5-D

2010 WITH PROJECT SUNDAY MIDDAY PEAK INTERSECTION VOLUMES

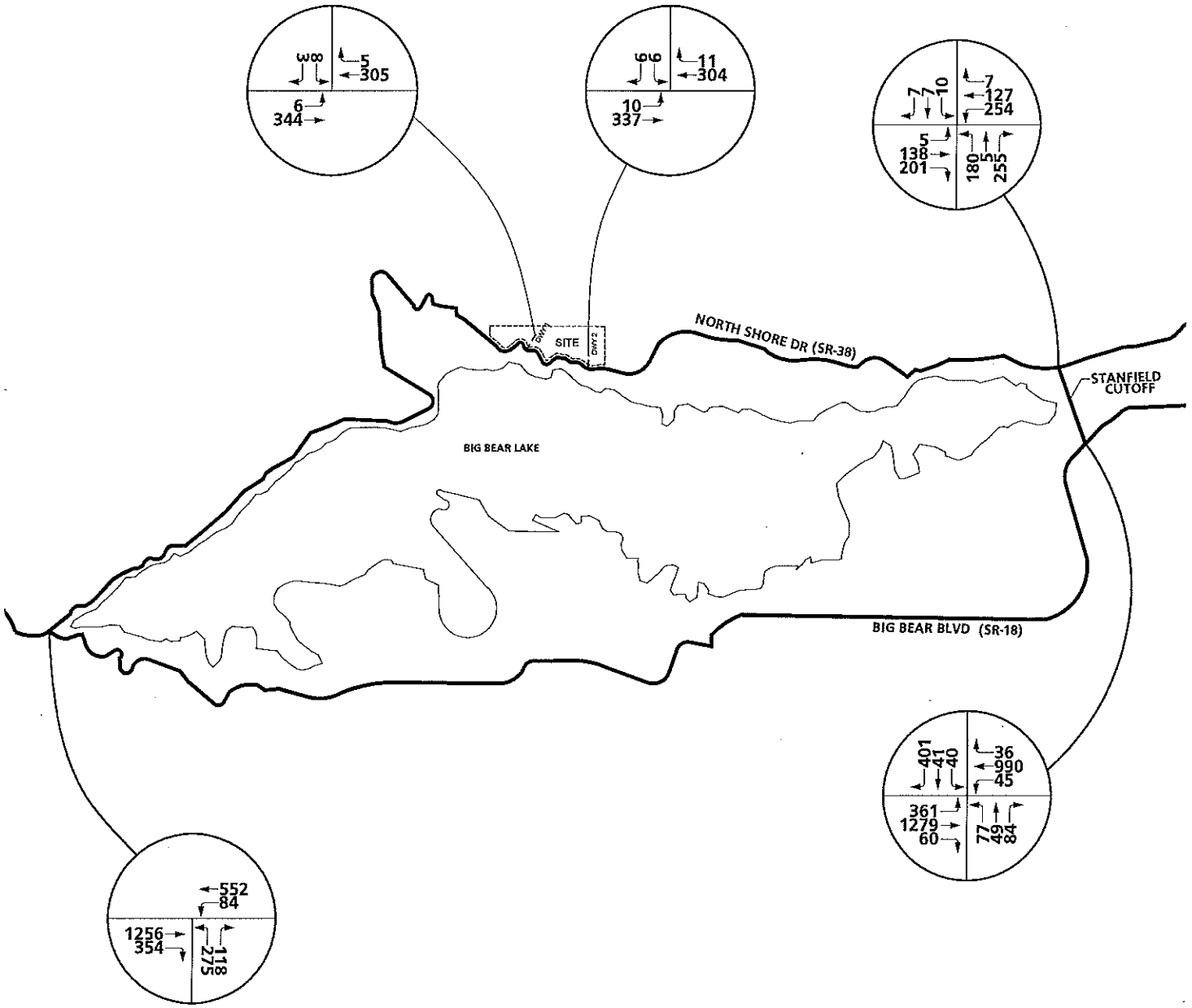

TABLE 5-3

INTERSECTION ANALYSIS FOR GENERAL PLAN BUILDOUT (2030) CONDITIONS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	T	R	SOUTH-BOUND L	T	R	EAST-BOUND L	T	R	WEST-BOUND L	T	R	DELAY[2] (SECS.) Fri. PM	Sun. MD	LEVEL OF SERVICE Fri. PM	Sun. MD
North Shore Dr. (SR-38) (NS) at:																	
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	CSS	0	1	0	0	0	0	0	1	1	1	1	0	--[4]	--[4]	F	F
- With Improvements	TS	1	0	1	0	0	0	0	2	1>	1	1	0	20.4	18.6	C	B
Stanfield Cutoff (NS) at:																	
• North Shore Dr. (SR-38) (EW)																	
- Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	--[4]	--[4]	F	F
- With Improvements	TS	2	1	0	1	1	0	1	1	1>	1	1	0	34.2	26.0	C	C
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	TS	0	1	1	0	1	1	1	1	1	1	1	1	--[4]	--[4]	F	F
- With Improvements	TS	1	1	0	1	1	1>	1	2	0	1	2	1	31.7	21.5	C	C
Driveway # 1 (NS) at:																	
• North Shore Dr. (SR-38) (EW)																	
- Without Improvements	CSS	0	0	0	0	1	0	0	1	0	0	1	0	49.5	24.2	E	C
- With Improvements	CSS	0	0	0	0	1	0	1	2	0	0	1	0	23.1	15.7	C	C
Driveway # 2 (NS) at:																	
• North Shore Dr. (SR-38) (EW)																	
- Without Improvements	CSS	0	0	0	0	1	0	0	1	0	0	1	0	41.9	18.8	E	C
- With Improvements	CSS	0	0	0	0	1	0	1	2	0	0	1	0	23.6	15.7	C	C

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1 = Improvement; > = Right Turn Overlap Phase

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.7 R5 (2005). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross Street Stop
AWS = All Way Stop

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

[5] Volume to Capacity ratio is greater than 1.00 = Level of Service "F".

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EXHIBIT 5-E

GENERAL PLAN BUILDOUT WITH PROJECT FRIDAY PM PEAK HOUR INTERSECTION VOLUMES

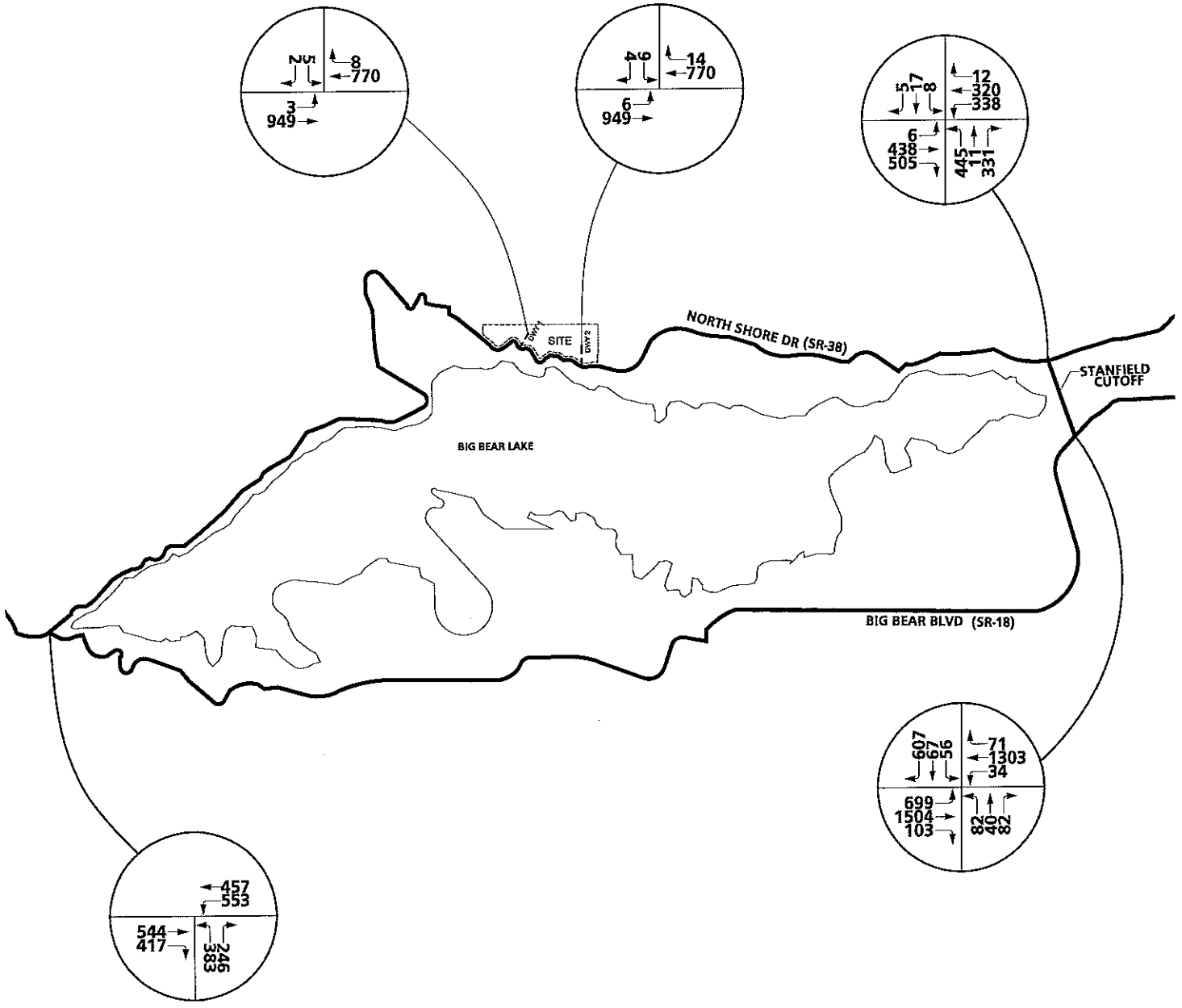
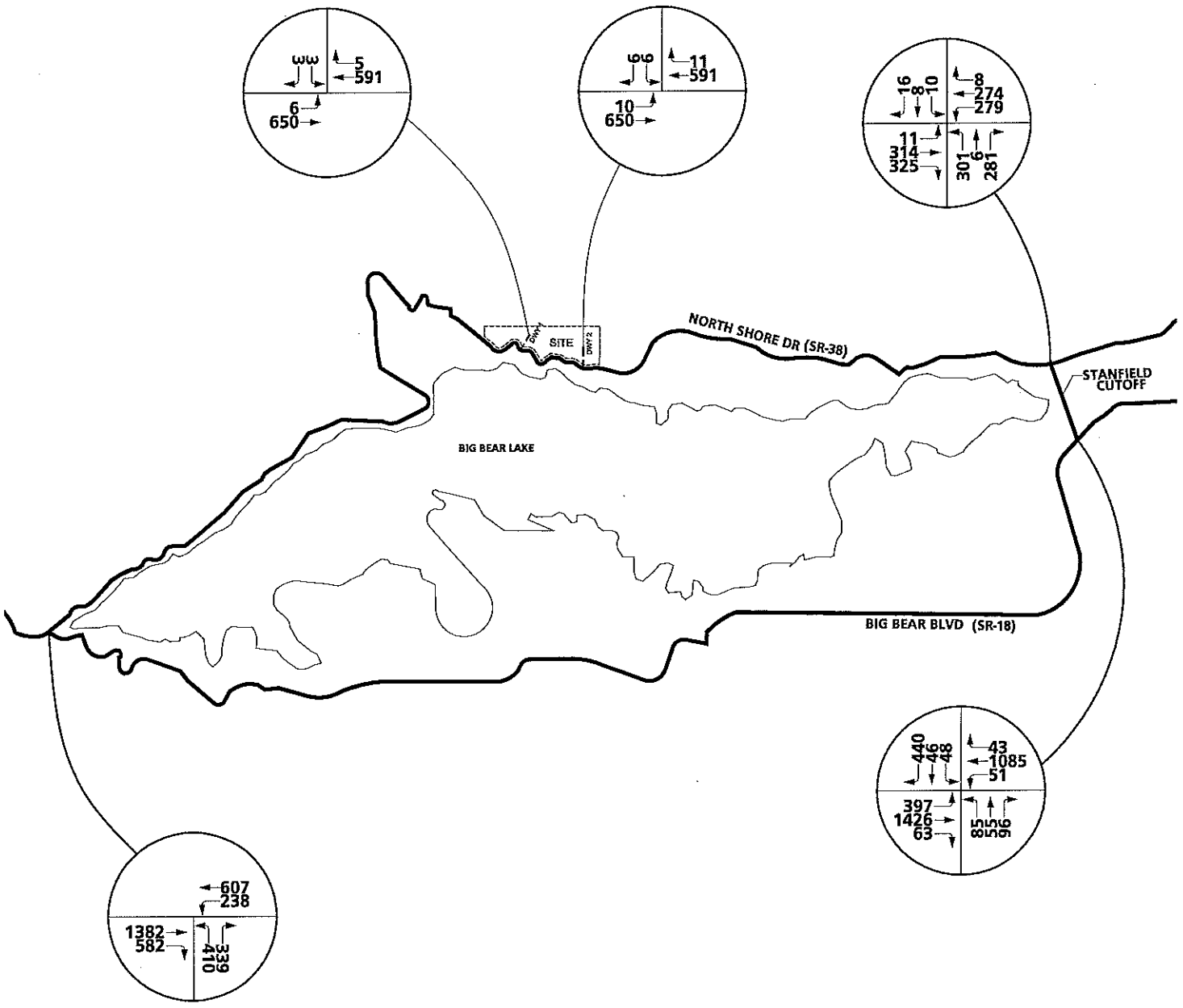


EXHIBIT 5-F

GENERAL PLAN BUILDOUT WITH PROJECT SUNDAY MIDDAY PEAK HOUR INTERSECTION VOLUMES



URBAN CROSSROADS

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

Driveway #1 (NS) at:

- North Shore Drive (SR-38) (EW)

Driveway #2 (NS) at:

- North Shore Drive (SR-38) (EW)

The operations analysis worksheets for General Plan Buildout With Project (2030) traffic conditions are included in Appendix "H".

6.0 SUMMARY AND RECOMMENDATIONS

This chapter summarizes the findings of this traffic impact analysis, and provides a series of recommendations related to project implementation.

6.1 Summary

The traffic issues related to the proposed land use and development have been evaluated in the context of the California Environmental Quality Act (CEQA) and the San Bernardino County Congestion Management Program (CMP). In conformance with the requirements of the San Bernardino County Congestion Management Program (CMP), the proposed project does not require a CMP traffic study. The CMP requires no analysis for projects that generate less than 250 peak hour trips. The project generates approximately 51 and 51 trips during the AM and PM peak hours, respectively; which is less than the required threshold for a CMP traffic study. However, a long-range traffic analysis has been required by County staff.

Project traffic volumes for all future conditions were estimated using a manual approach. The trip generation calculation is based on the most recent Institute of Transportation Engineers Trip Generation Rates, 7th Edition. The project trip distributions are derived from a select zone run of the San Bernardino Mountain Model.

Long Range General Plan Buildout (2030) conditions have been estimated based on the San Bernardino Mountain Model and the addition of both the project related peak hour volumes and the known cumulative development peak hour volumes per discussions with County staff.

6.1.1 The Project

The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and three lots for open space and common area on approximately 62.43 acres. Exhibit 1-B illustrates the project site plan.

The traffic related to the project has been calculated in accordance with the following accepted procedural steps:

- Trip Generation
- Trip Distribution
- Traffic Assignment

Table 2-2 (previously presented) summarizes the projected trip generation for the proposed development. As indicated in Table 2-2, the proposed Moon Camp residential development is projected to generate 479 trip-ends per day with 51 vehicles per hour during the weekday PM peak hour.

6.1.2 Existing Study Area Conditions

Regional access to the site is provided via North Shore Boulevard.

6.1.3 Future Conditions

An Interim Year (2010) analysis and long-range General Plan Buildout (2030) analysis are included in this report. Interim Year (2010) traffic operations analysis has been completed for the Friday PM and Sunday Mid-day peak hours and are shown in Tables 5-1 and 5-2 (previously presented). Friday PM peak hour and Sunday Mid-day peak hour traffic operations analysis are summarized in Tables 5-3 (previously presented)

for General Plan Buildout With Project (2030) conditions. All study intersections are projected to experience Level of Service "C" or better operations during the peak hours for all scenario analyzed.

6.2 Recommendations

The recommendations in this section address all necessary on-site improvements and off-site transportation improvements.

6.2.1 On-Site Improvements

On-site improvements and improvements adjacent to the site will be required in conjunction with the proposed development to ensure adequate circulation within the project itself. Exhibit 6-A illustrates the recommended improvement measures to address on-site circulation requirements of the proposed site, which include the following:

- Sight distance at the project access roadway should be reviewed with respect to Caltrans / County of San Bernardino sight distance standards at the time of final grading landscape and street improvement plans.

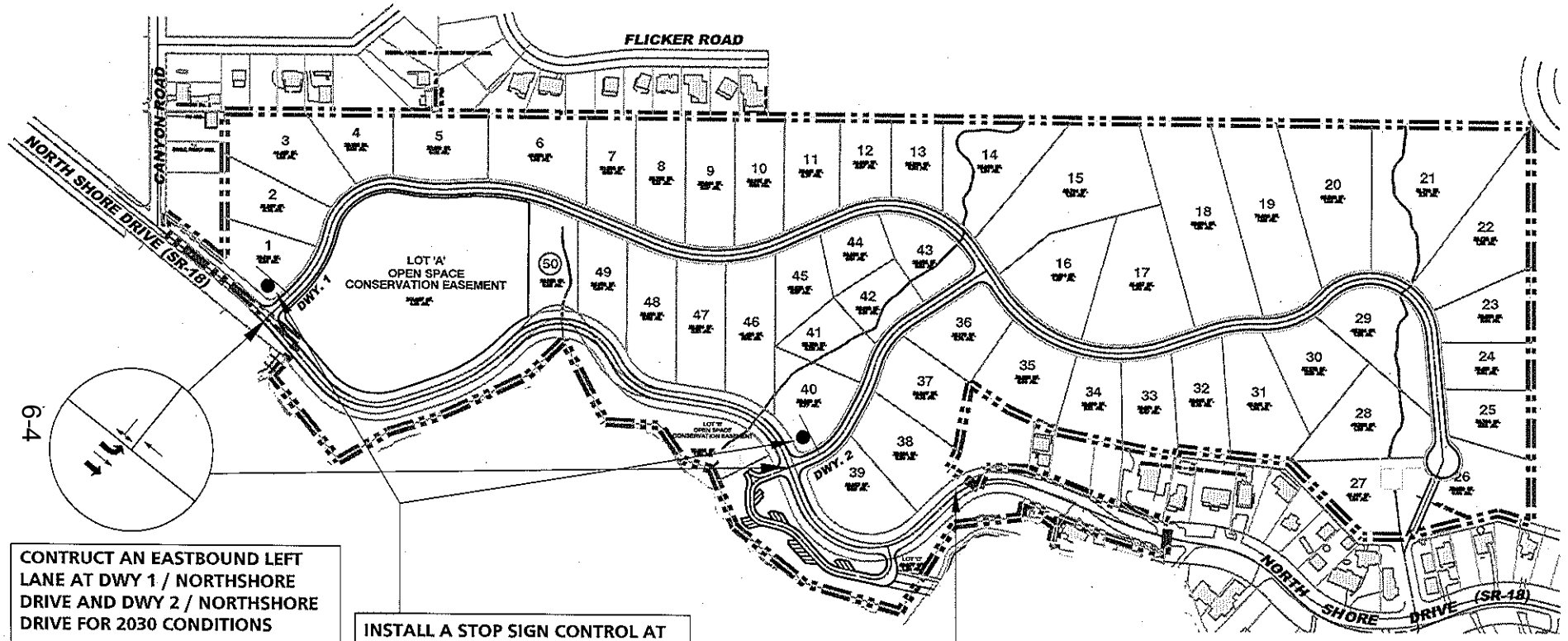
- Traffic signing / striping should be implemented in conjunction with detailed construction plans for the project site.

- Construct North Shore Drive at its ultimate half-section width as a Mountain Major highway from Canyon Drive to the Easterly project boundary.

- Install a stop sign control at Driveway #1 and Driveway #2

EXHIBIT 6-A

CIRCULATION RECOMMENDATIONS



CONTRUCT AN EASTBOUND LEFT LANE AT DWY 1 / NORTHSHORE DRIVE AND DWY 2 / NORTHSHORE DRIVE FOR 2030 CONDITIONS

INSTALL A STOP SIGN CONTROL AT THE DRIVEWAY 1 AND DRIVEWAY 2.

CONTRUCT A SECOND EASTBOUND THROUGH LANE AT DWY 1 / NORTHSHORE DRIVE AND DWY 2 / NORTHSHORE DRIVE FOR 2030 CONDITIONS

TRAFFIC SIGNING AND STRIPING SHOULD BE IMPLEMENTED IN CONJUNCTION WITH DETAILED CONSTRUCTION PLANS FOR THE PROJECT SITE.

SIGHT DISTANCE AT EACH PROJECT ACCESS ROADWAY SHOULD BE REVIEWED WITH RESPECT TO STANDARD CALTRANS AND COUNTY OF SAN BERNARDINO SIGHT DISTANCE STANDARDS AT THE TIME OF FINAL GRADING, LANDSCAPE AND STREET IMPROVEMENT PLANS.

CONSTRUCT NORTH SHORE DRIVE AT ITS ULTIMATE HALF-SECTION AS A MOUNTAIN MAJOR HIGHWAY FROM CANYON ROAD TO THE EASTERLY PROJECT BOUNDARY.

LEGEND:

● = STOP SIGN

➡ = RECOMMENDED IMPROVEMENT

N

URBAN CROSSROADS

- Construct an Eastbound Left Turn Lane at Driveway 1 / North Shore Drive and Driveway 2/ North Shore Drive for 2030 Buildout Conditions

- Construct a 2nd Eastbound Through Lane at Driveway 1 / North Shore Drive and Driveway 2/ North Shore Drive for 2030 Buildout Conditions

6.2.2 Off-Site Improvements

The necessary off-site improvement recommendations were described in previous sections of this report. Exhibit 6-B illustrates the recommended improvements for 2010 Without Project and With Project traffic conditions. There are no additional recommended improvements for 2010 With Project traffic conditions compared to 2010 Without Project traffic conditions. Exhibit 6-C illustrates the recommended improvements for General Plan Buildout (2030) traffic conditions compared to the improvements shown on Exhibit 6-B.

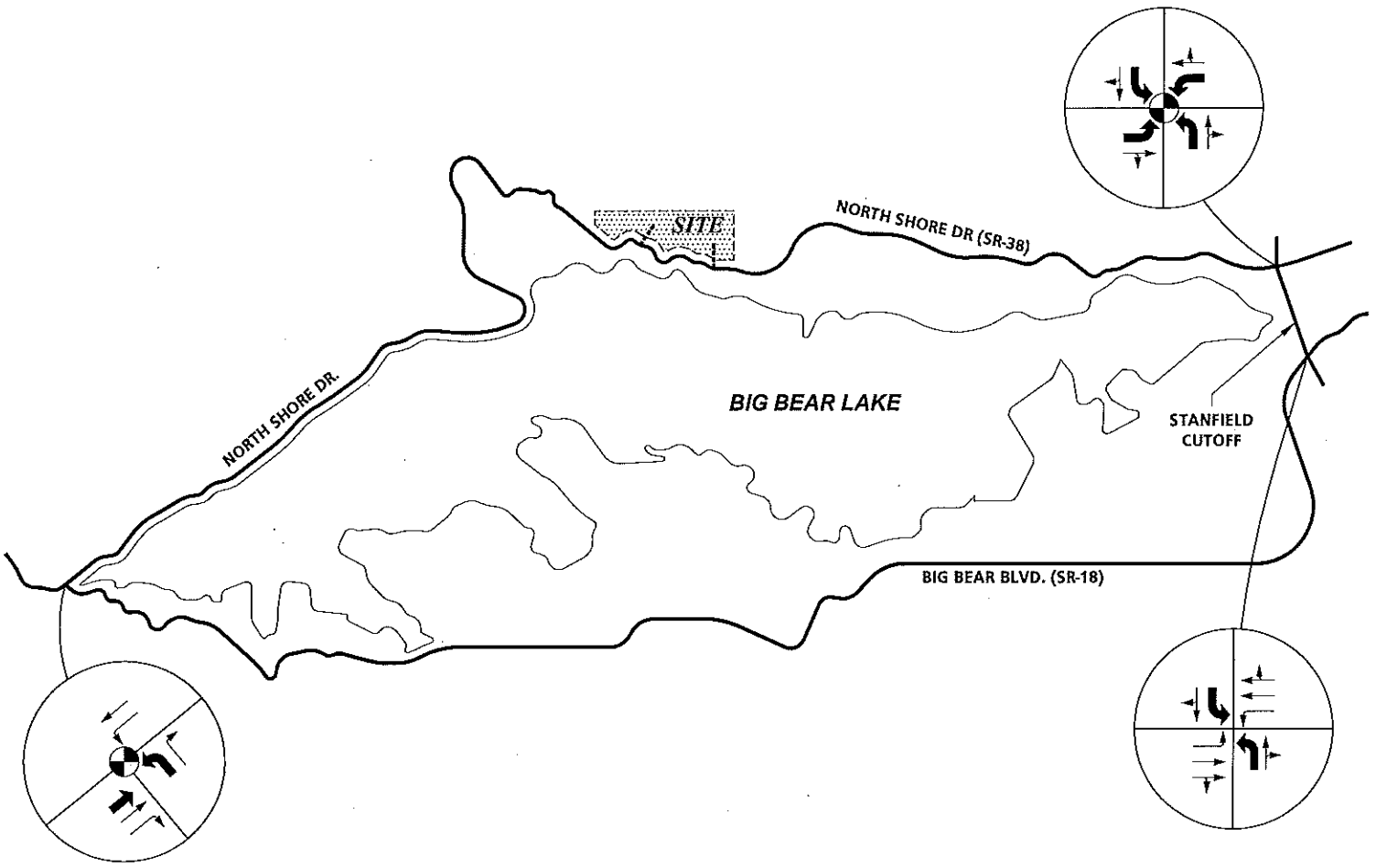
6.2.3 Project Fair Share Analysis

This section of the report summarizes the improvements and associated costs required to meet San Bernardino Congestion Management Program (CMP) level of service requirements for long range traffic condition, per discussion with County staff.

Table 6-1 indicates the needed long range 2030 improvements and resulting costs for the study area intersections. The cost data is provided in Appendix "G" of the San Bernardino Congestion Management Program, 2003 update (see Appendix "I"). Estimated cost (per SANBAG CMP table)

EXHIBIT 6-B

RECOMMENDED IMPROVEMENTS FOR 2010 WITHOUT AND WITH PROJECT CONDITIONS



LEGEND:

= TRAFFIC SIGNAL

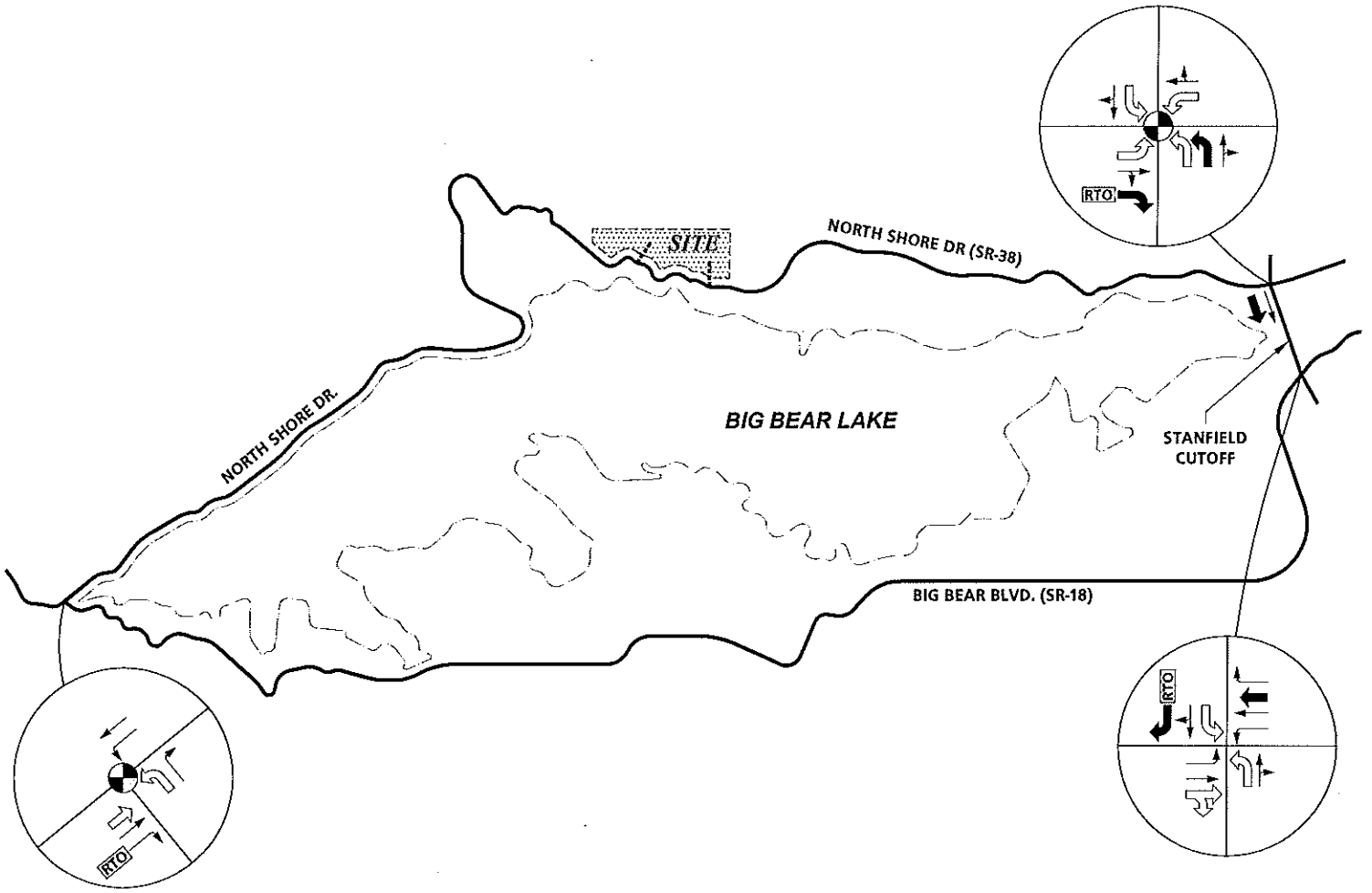
= EXISTING LANE

= CURRENT PHASE IMPROVEMENTS

N

EXHIBIT 6-C

ADDITIONAL RECOMMENDED IMPROVEMENTS FOR GENERAL PLAN BUILDOUT (2030) CONDITIONS



LEGEND:

- = TRAFFIC SIGNAL
- = EXISTING LANE
- = CURRENT PHASE IMPROVEMENTS
- = PREVIOUS PHASE IMPROVEMENTS
- RTO = RIGHT TURN OVERLAP PHASING IMPROVEMENTS

N

TABLE 6-1

ROADWAY IMPROVEMENTS COST

INTERSECTION	2030 IMPROVEMENTS	COST
North Shore Dr. (SR-38) (NS) at: • Big Bear Blvd. (SR-18) (EW)	Install Traffic Signal	$250,000
	Construct NB Left Turn Lane	$50,000
	Construct EB Through Lane	$289,720
	Add Right Turn Overlap Phasing	$25,000
		$614,720
Standfield Cutoff (NS) at: • North Shore Dr. (EW)		
	Install Traffic Signal	$250,000
	Construct 2 NB left turn lanes	$100,000
	Construct SB left turn lane	$50,000
	Construct EB left turn lane	$50,000
	Construct EB right turn lane	$50,000
	Add Right Turn Overlap Phasing	$25,000
	Construct WB left turn lane	$50,000
		$575,000
Stanfield Cutoff (NS) at: • Big Bear Blvd. (EW)		
	Construct NB left turn lane	$50,000
	Construct SB left turn lane	$50,000
	Add Right Turn Overlap Phasing	$25,000
	Construct EB through lane	$289,720
	Construct WB through lane	$289,720
		$704,440
TOTAL - COST OF CONSTRUCTION		**$1,894,160**

Source: Appendix "G" of the San Bernardino Congestion Management Program, 2003 update.

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for a through lane is $289,720 (600 feet long for upstream and 600 feet long including taper for downstream). As indicated in Table 6-1, the total cost of needed intersection improvements is $1,894,160.

The project fair share contribution towards the required improvements has also been calculated. Table 6-2 includes the project's cost contribution based on the project's percent of new traffic. As indicated in Table 6-2, the highest Friday PM or Sunday Mid-day fair share cost is approximately $129,193.

6.2.4 Transportation System Management Actions

a. Off-Site

As development in the area occurs, transit agencies should consider expanding service within the area.

b. On-Site

The on-site design should accommodate private and/or public bus access design and parking as necessary.

TABLE 6-2

PROJECT FAIR SHARE

SEGMENT	COST	PEAK HOUR	EXISTING TRAFFIC	2030 WITH PROJECT TRAFFIC	PROJECT TRAFFIC	TOTAL NEW TRAFFIC	PROJECT % OF NEW TRAFFIC	(A) FRIDAY PM PROJECT COST SHARE	(B) SUNDAY MID. PROJECT COST SHARE	HIGHEST FRIDAY PM OR SUNDAY MID. COST SHARE
North Shore Dr. (SR-38) (NS) at:										
• Big Bear Blvd. (EW)	$614,720									
		Friday PM	906	1625	15	719	2.09%	$12,824	$37,083	$37,083
		Sunday Midday	2208	2639	26	431	6.03%			
Standfield Cutoff (NS) at:										
• North Shore Dr. (EW)	$575,000									
		Friday PM	822	1,119	35	297	11.78%	$67,761	$51,199	$67,761
		Sunday Midday	904	1,196	26	292	8.90%			
Stanfield Cutoff (NS) at:										
• Big Bear Blvd. (EW)	$704,440									
		Friday PM	2,745	3,584	29	839	3.46%	$24,349	$17,653	$24,349
		Sunday Midday	2,625	3,463	21	838	2.51%			
GRAND TOTAL - COST SHARE FOR IMPROVEMENTS								**$104,934**	**$105,935**	**$129,193**

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E.2 - Revised Traffic Study (Urban Crossroads, June 2007)

URBAN
CROSSROADS

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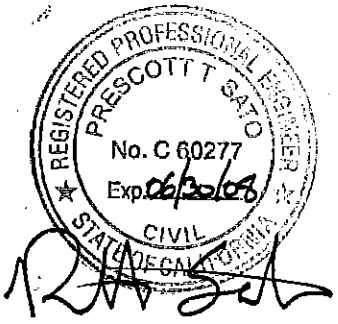

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MOON CAMP
TRAFFIC IMPACT ANALYSIS
COUNTY OF SAN BERNARDINO, CALIFORNIA

June 29, 2007 (REVISED)
April 24, 2007

JN:04409-02
SS:RA:JCS :dl

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MOON CAMP
TRAFFIC IMPACT ANALYSIS
COUNTY OF SAN BERNARDINO, CALIFORNIA

1.0 INTRODUCTION

This report summarizes the traffic impact analysis conducted to assess the potential impacts of the proposed Moon Camp residential development on the roadway system in the study area. The proposed development is generally located along North Shore Drive in the County of San Bernardino. The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and three lots for open space and common area on approximately 62.43 acres. The general location of the project site is presented on Exhibit 1-A.

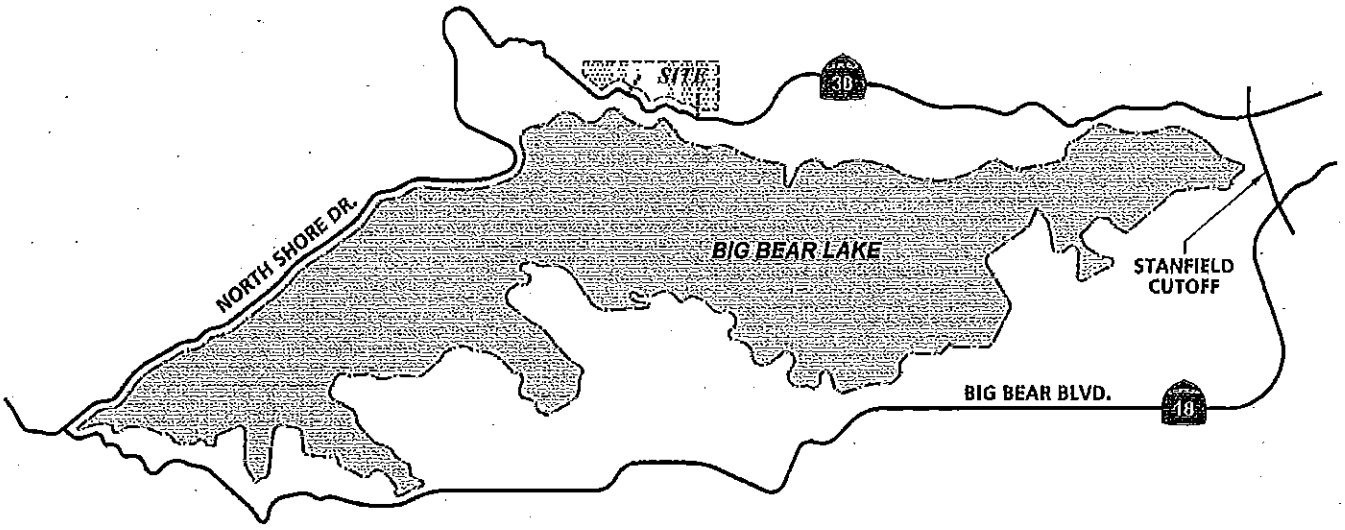
In conformance with the requirements of the San Bernardino County Congestion Management Program (CMP), the proposed project does not require a CMP traffic study. The CMP requires no analysis for projects generating less than 250 peak hour trips. The project generates approximately 51 and 51 trips during the AM and PM peak hours, respectively; which is less than the required threshold for a CMP traffic study. However, per discussion with County staff, the traffic study should follow CMP guidelines and a long-range traffic analysis is required.

The introduction to this report presents an overview of the project and provides a brief description of the study area. The analysis methodologies used to evaluate the impacts of the project are described and the definitions of roadway system deficiencies and significant project impacts are presented in the context of the County of San Bernardino and CEQA requirements.

Subsequent sections of the report will describe the project in detail and provide a complete description of existing and projected traffic conditions within the study area.

EXHIBIT 1-A

LOCATION MAP



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MOON CAMP TIA, San Bernardino County, California - 04409:01 (REVISED)

URBAN CROSSROADS

1.1 Project Overview

The proposed Moon Camp residential development is generally located north of North Shore Drive south of Flicker Road and east of Canyon Road in San Bernardino County. The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and three open space lots and common area. Exhibit 1-B illustrates the site plan.

There are two (2) primary full access points to the project site located off North Shore Drive.

Additional detailed discussion of the roadway network features of the project and its traffic generation characteristics will be provided in subsequent sections of this report.

1.2 Study Area

The overall study area evaluated in this study is presented on Exhibit 1-A. Based on discussion with County transportation staff, the study area includes the following existing study intersections:

Stanfield Cutoff (NS) at:

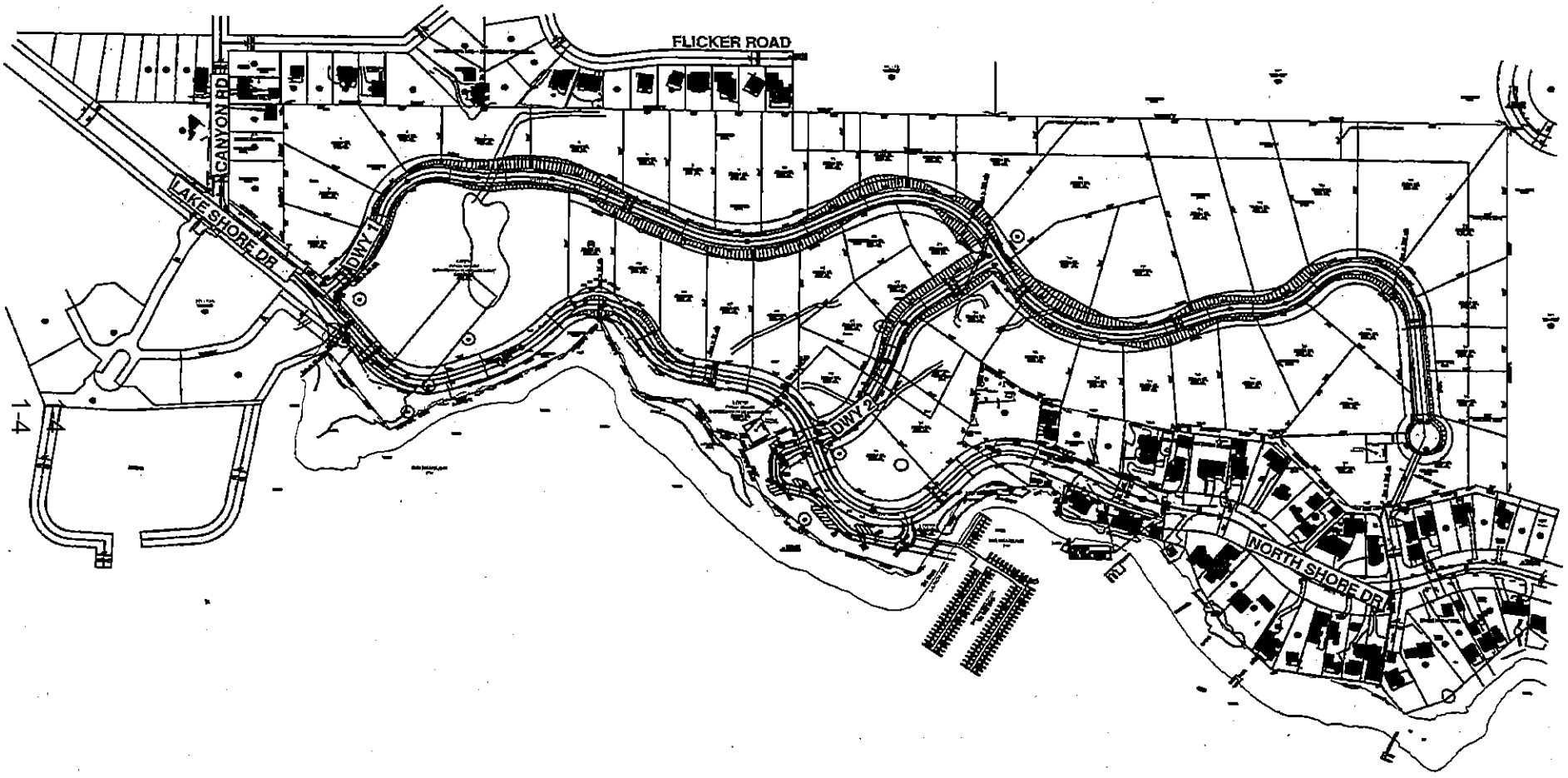
- North Shore Drive (SR-38) (EW)
- Big Bear Boulevard (SR-18) (EW)

North Shore Drive (SR-38) (NS) at:

- Big Bear Boulevard (SR-18) (EW)

EXHIBIT 1-B

SITE PLAN



1.3 Analysis Methodologies

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with the San Bernardino County Congestion Management Program. The following analysis years are considered in this report:

- Existing Condition – 2007
- Interim Year – 2010
- Long Range – 2030

The overall methodologies used to develop future traffic volume forecasts, and the explicit traffic operations analysis methodologies are summarized herein. The primary section of interest to the non-technically oriented reviewer is Section 1.4.2 (Definition of Significant Impact).

1.3.1 Overall Analysis Methodology

As described previously, traffic conditions are evaluated in this report for existing conditions, 2010 Interim Year Without Project conditions, 2010 Interim Year With Project conditions, and Long Range General Plan Buildout (2030) conditions.

Actual traffic count data was obtained from manual intersection counts (conducted in March 2007, see Appendix "A") to quantify existing traffic conditions. Per discussion with County staff, the peak season of the study area occurs during the summer months, thus a 16% growth is applied to manual intersection counts to represent existing peak hour intersection volumes.

Project traffic volumes for all future conditions were estimated using the manual approach. Trip generation has been estimated based on data collected by the Institute of Transportation Engineers (ITE). The project trip distribution was derived from a select zone run of the San Bernardino Mountain Model.

Interim Year conditions have been estimated based on areawide growth (other projects that are approved, pending, or under construction) and the addition of the project related peak hour volumes. An area-wide growth of 2% per year is applied to adjusted existing volumes (with 16% growth).

The Interim Year 2010 without project traffic volumes are estimated based on the 2007 existing traffic volumes (with 16% adjustment) plus the 2007 to 2010 background growth volumes (2%) plus the known cumulative development volumes.

Project traffic volumes for all future conditions were estimated using the manual approach described in the CMP guidelines. The trip generation calculation is based on the most recent Institute of Transportation Engineers Trip Generation Rates, 7th Edition. The project trip distribution was developed from a select zone run of the San Bernardino Mountain Model and was reviewed by the County of San Bernardino staff. The project only traffic forecasts have been generated by applying the trip generation, distribution and traffic assignment calculations.

Long Range General Plan Buildout (2030) conditions have been estimated based on the San Bernardino Mountain Model and the addition of both the project related peak hour volumes and the known cumulative development peak hour volumes per discussions with County staff.

1.3.2 Traffic Operations Analysis

The current technical guide to the evaluation of traffic operations is the 2000 Highway Capacity Manual (HCM) (Transportation Research Board Special Report 209). The HCM defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS (Level of Service) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted. The definitions of level of service for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- LOS "A" represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.

- LOS "B" is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.

- LOS "C" is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.

- LOS "D" represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.

- LOS "E" represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.

- LOS "F" is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

Uninterrupted flow is generally found only on limited access (freeway) facilities in urban areas. The definitions of level of service for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control.

The level of service is typically dependent on the quality of traffic flow at the intersections along a roadway. The HCM methodology expresses the level of service at an intersection in terms of delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control. The levels of service determined in this study are calculated using the HCM methodology.

For signalized intersections, average total delay per vehicle for the overall intersection is used to determine level of service. Levels of service at signalized study intersections have been evaluated using an HCM intersection analysis program.

The study area intersections which are stop sign controlled with stop-control on the minor street only have been analyzed using the two-way stop

controlled unsignalized intersection analysis methodology of the HCM. For these intersections, the calculation of level of service is dependent on the occurrence of gaps occurring in the traffic flow of the main street. Using data collected describing the intersection configuration and traffic volumes at these locations to calculate average intersection delay; the level of service has been calculated. The level of service criteria for this type of intersection analysis is based on total delay per vehicle for the worst minor street movement(s).

The levels of service are defined in terms of average delay for the intersection analysis methodology as follows:

LEVEL OF SERVICE	AVERAGE TOTAL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	0 to 10.00	0 to 10.00
B	10.1 to 20.00	10.01 to 15.00
C	20.1 to 35.00	15.01 to 25.00
D	35.1 to 55.00	25.01 to 35.00
E	55.1 to 80.00	35.01 to 50.00
F	Over 80.0 or V/C ≥ 1.00	50.01 and up

Per the CMP guidelines, signalized intersections are considered deficient (LOS "F") if the overall intersection critical volume to capacity (V/C) ratio equals or exceeds 1.0, even if the level of service defined by the delay value is below the defined LOS standard. The V/C ratio is defined as the critical volumes divided by the intersection capacity. A V/C ratio greater than 1.0 implies an infinite queue.

The LOS analysis for signalized intersections has been performed using optimized signal timing. This analysis has included an assumed lost time of two seconds per phase in accordance with San Bernardino CMP recommended default values. Signal timing optimization has considered pedestrian safety and signal coordination requirements. Appropriate time for pedestrian crossing have also been considered in the signalized intersection analysis. The following formula has been used to calculate the pedestrian minimum times for all HCM runs:

[(Curb to Curb distance) / (4 feet/second)] + 5 seconds

The resulting minimum green times are shown in the appendices for each analyzed scenario. Saturation flow rates of 1,800 vehicles per hour of green (vphg) for through and right-turn lanes and 1,700 vphg for single left-turn lanes, 1,600 vphg per lane for dual left-turn lanes, and 1,500 vphg per lane for triple left-turn lanes have been assumed for all capacity analysis under 2007 Existing and 2010 Interim Year conditions. Under 2030 Horizon Year conditions, saturation flow rates of 1,900 vphg for through and right-turn lanes and 1,800 vphg for single left-turn lanes, 1,700 vphg per lane for dual left-turn lanes, and 1,600 vphg per lane for triple left-turn lanes have been assumed. These are the default values recommended by the CMP guidelines.

The 2030 peak hour factor has been adjusted upwards to 0.95. This is specifically allowed by the San Bernardino CMP guidelines to account for the effects of congestion on peak spreading. Peak spreading refers to the tendency of traffic to spread more evenly across time as congestion increases.

1.4 Definition of Deficiency and Significant Impact

The following definitions of deficiencies and significant impacts have been developed in accordance with the County of San Bernardino requirements.

1.4.1 Definition of Deficiency

County of San Bernardino guidelines indicate that peak hour intersection operations of LOS "C" or better are considered acceptable. Therefore, any intersection operating at LOS "D" or worse is considered deficient. Per CMP direction, state controlled facilities (state highways, freeway ramp intersection, etc.) are subject to local jurisdiction (California Department of Transportation) traffic operations requirements, with no greater than 45 seconds average stopped delay per vehicle allowed during peak hour operations (middle of LOS "D")

The identification of a CMP deficiency requires further analysis in satisfaction of CMP and County requirements, including:

- Evaluation of the mitigation measures required to restore traffic operations to an acceptable level of service with respect to CMP and local jurisdiction LOS standards.
- Calculation of the project share of new traffic on the impacted CMP facility during peak hours of traffic.
- Estimation of the cost required to implement the improvements required to restore traffic operations to an acceptable level of service as described above.

This study incorporates each of these aspects for all locations where a CMP deficiency is identified.

1.4.2 Definition of Significant Impact

The identification of significant impacts is a requirement of CEQA, and is not directly addressed in the CMP document. The County of San Bernardino General Plan and Circulation Element have been adopted in accordance with CEQA requirements, and any roadway improvements within the County of San Bernardino which are consistent with these documents are not considered a significant impact, so long as the project contributes its "fair share" funding for improvements.

A traffic impact is considered significant and immitigable if the project both: i) contributes measurable traffic to and ii) substantially and adversely changes the level of service at any off-site location projected to experience deficient operations under foreseeable cumulative conditions, where feasible improvements consistent with the County of San Bernardino General Plan cannot be constructed.

2.0 PROJECT DESCRIPTION

This section describes the project land uses and traffic characteristics for each of the future conditions analyzed.

2.1 Project Description

The proposed Moon Camp residential development is located along North Shore Drive in the County of San Bernardino. The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and one existing single-family detached dwelling unit. Exhibit 1-B (previously presented) illustrates the site plan.

There are two (2) primary full access points to the project site located off North Shore Drive.

2.2 Project Traffic

The traffic related to the project has been calculated in accordance with the following accepted procedural steps:

- Trip Generation
- Trip Distribution
- Traffic Assignment

These steps are described in detail below.

2.2.1 Project Trip Generation

The trip generation calculation is based on the most recent Institute of Transportation Engineers Trip Generation Rates, 7th Edition. Table 2-1 indicates the proposed trip generation rates. As indicated in Table 2-2, the

TABLE 2-1

TRIP GENERATION RATES[1]

LAND USE	ITE CODE	QUANTITY	UNITS[2]	FRIDAY PM PEAK HOUR			SUNDAY MID-DAY PEAK HOUR			DAILY
				IN	OUT	TOTAL	IN	OUT	TOTAL	
PROJECT										
Single Family Residential	210	50	DU	0.64	0.37	1.01	0.64	0.37	1.01	9.57
CUMULATIVE PROJECTS										
Hotel	310	Varies	ROOMS	0.31	0.28	0.59	0.31	0.28	0.59	8.17
Townhomes/Condominium	230	78	DU	0.35	0.17	0.52	0.35	0.17	0.52	5.86
Fast Food Restaurant With Drive-Thru	934	2.5	TSF	18.01	16.63	34.64	18.01	16.63	34.64	496.12
Shopping Center	820	10	TSF	6.57	7.12	13.70	6.57	7.12	13.70	152.03
Shopping Center	820	22.517	TSF	4.99	5.40	10.39	4.99	5.40	10.39	114.43
Automobile Care Center	942	4.375	TSF	1.69	1.69	3.38	1.69	1.69	3.38	20.00
Mini-Warehouse	151	3	AC	1.99	1.84	3.83	1.99	1.84	3.83	38.87
Office	710	6.3	TSF	0.17	0.83	1.00	0.17	0.83	1.00	11.01
Church	560	20	TSF	0.34	0.32	0.66	0.34	0.32	0.66	9.11

[1] Source: ITE (Institute of Transportation Engineers) Trip Generation Manual, 7th Edition, 2003.

[2] DU = Dwelling Units

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TABLE 2-2

PROJECT TRIP GENERATION SUMMARY

LAND USE	QUANTITY	UNITS[1]	FRIDAY PM PEAK HOUR			SUNDAY MID-DAY PEAK HOUR			DAILY
			IN	OUT	TOTAL	IN	OUT	TOTAL	
Single Family Residential	50	DU	32	19	51	32	19	51	479

[1] DU = Dwelling Units

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proposed Moon Camp residential development is projected to generate 479 trip-ends per day with 51 vehicles per hour during the weekday AM peak hour and 51 vehicles per hour during the weekday PM peak hour. It is our understanding that the weekday PM peak hour generates more trips than the Sunday Midday peak hour. Based on discussions with County of San Bernardino staff, weekday PM peak hour trip generation has been used in both Friday PM peak hour analysis and Sunday Mid-day peak hour analysis to represent a conservative worst case condition.

2.2.2 Project Trip Distribution and Assignment

The project trip distribution and assignment process represents the directional orientation of traffic to and from the project site. Trip distribution is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system.

Project trip distribution has been derived from a select zone run of the San Bernardino Mountain Model. The trip distribution pattern for both Friday PM peak and Sunday Mid-day peak is based on the Friday PM distribution per discussions with County staff. Exhibit 2-A illustrates the project trip distribution.

2.2.3 Project Only Traffic Volume Forecasts

The project only traffic forecasts have been generated by applying the trip generation, distribution and traffic assignment calculations. The project ADT volumes are presented on Exhibit 2-B. The project only Friday PM peak hour and Sunday Mid-day peak hour intersection volumes are depicted on Exhibit 2-C.

EXHIBIT 2-A

PROJECT TRIP DISTRIBUTION

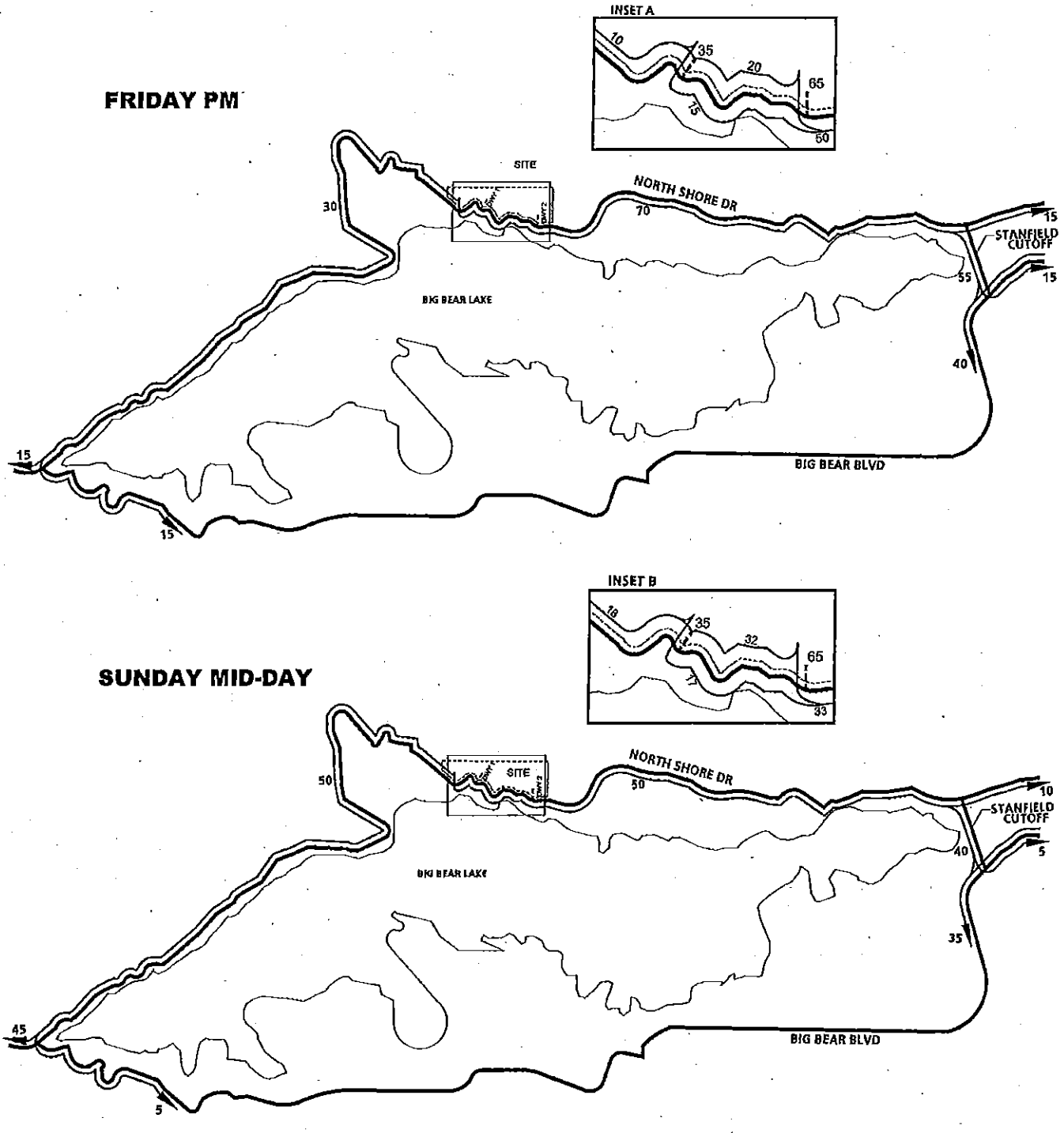
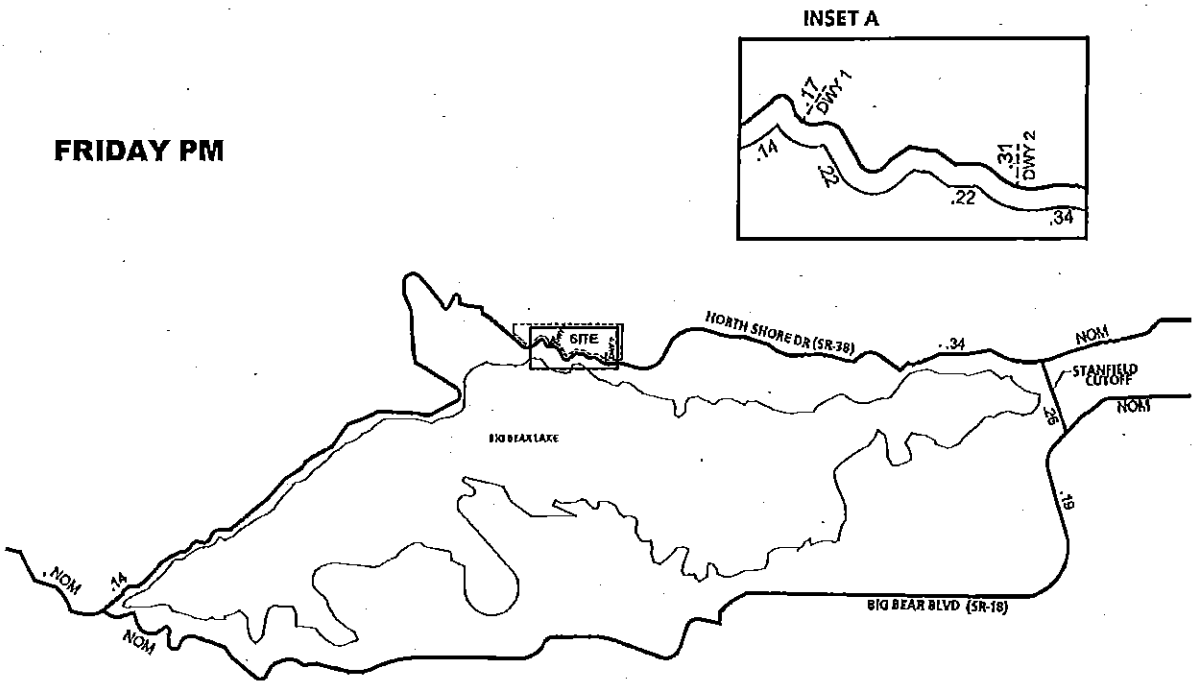


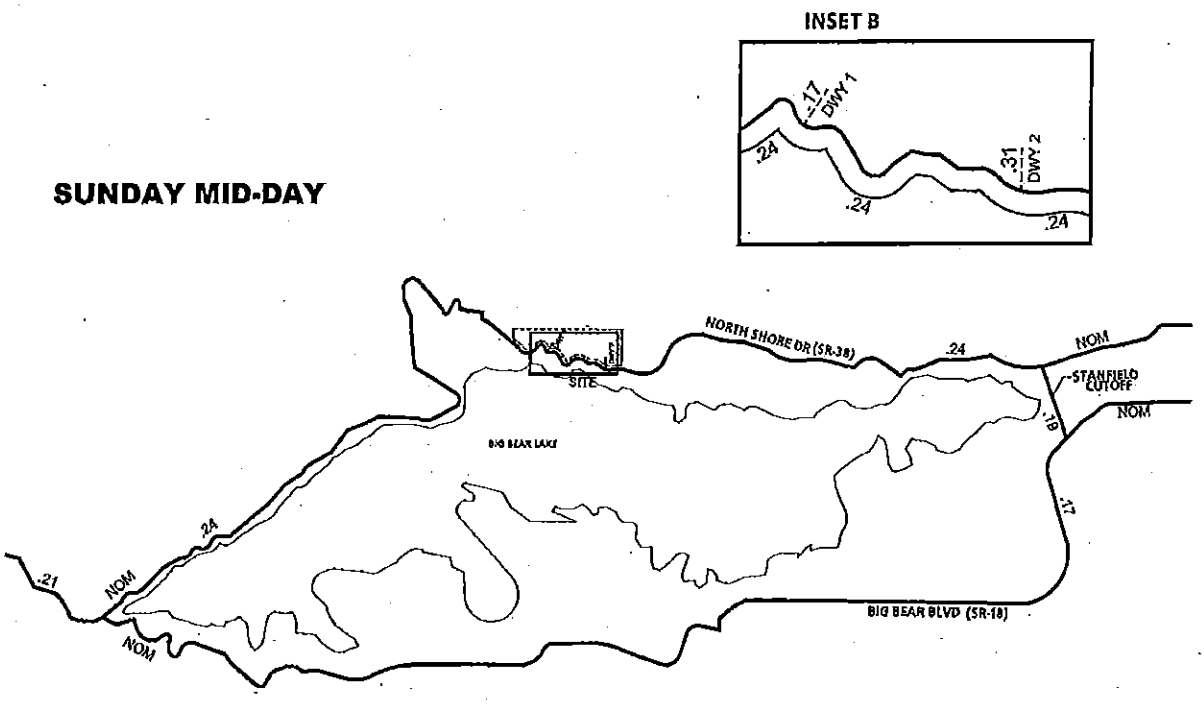
EXHIBIT 2-B

PROJECT AVERAGE DAILY TRAFFIC

FRIDAY PM



SUNDAY MID-DAY



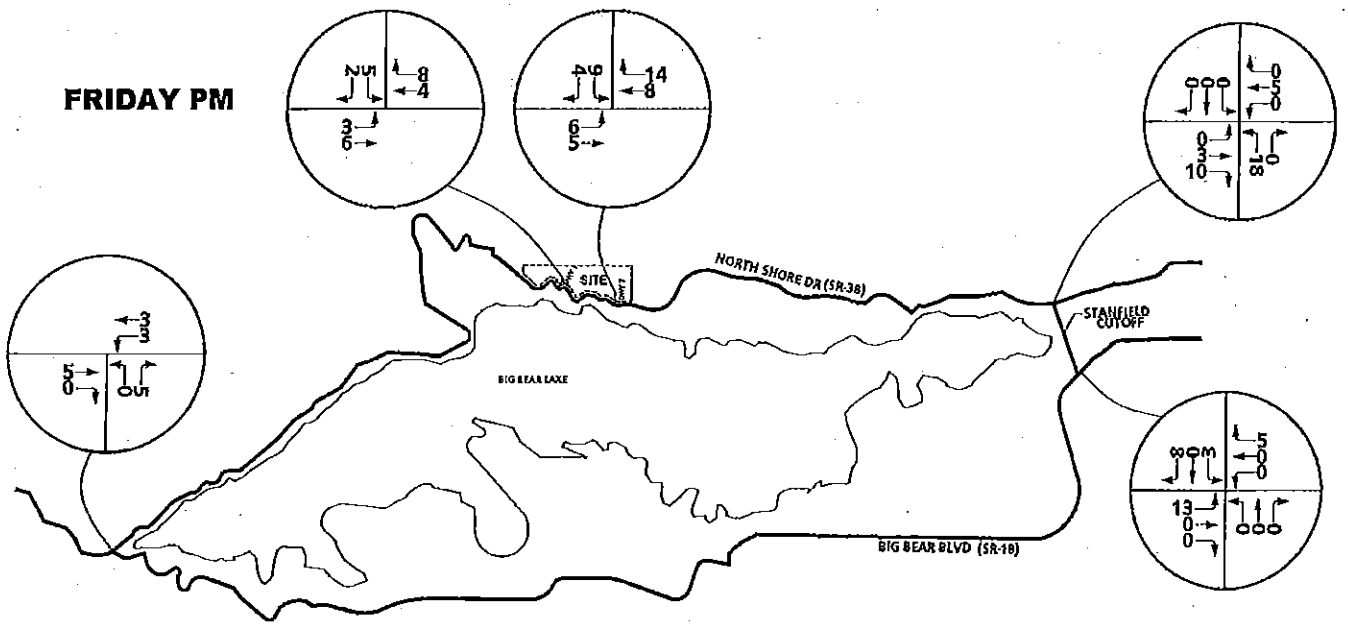
LEGEND:

10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

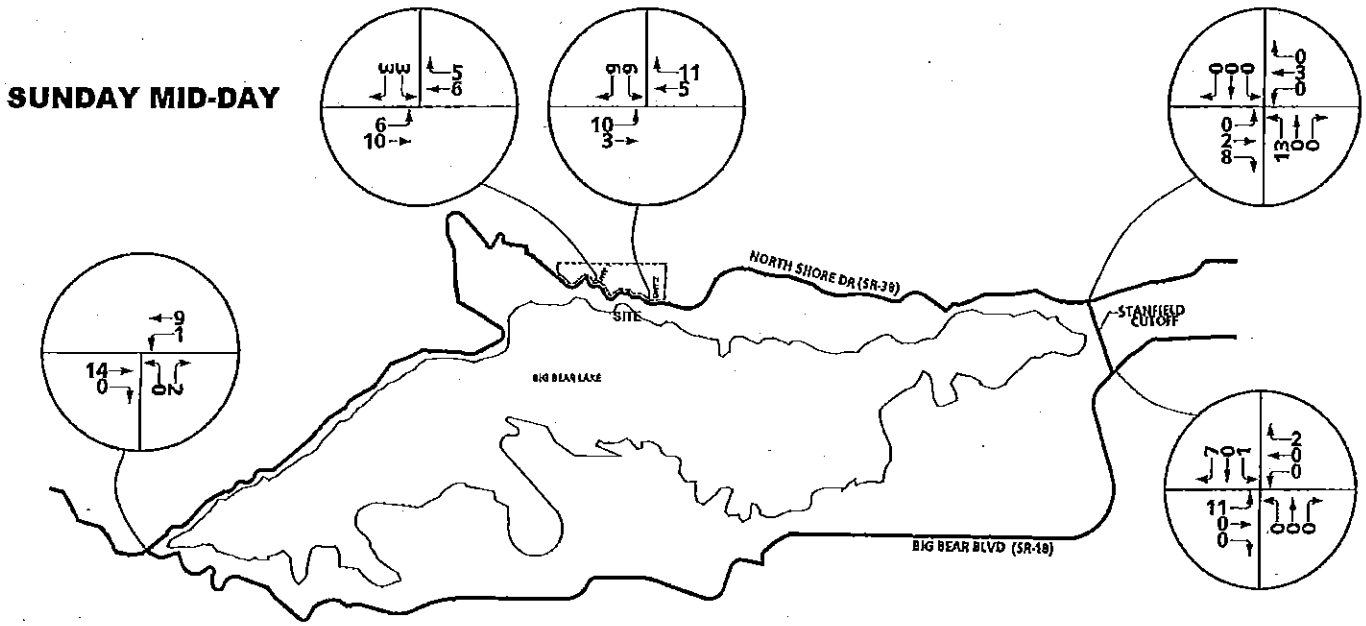
EXHIBIT 2-C

PROJECT FRIDAY PM PEAK HOUR / SUNDAY MIDDAY PEAK HOUR INTERSECTION VOLUMES

FRIDAY PM



SUNDAY MID-DAY



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3.0 EXISTING CONDITIONS

This section of the report summarizes existing roadway and traffic conditions in the study area. All analysis locations which exist today have been analyzed. The number of through travel lanes for existing roadways and intersection controls are presented, along with existing traffic count data collected for this study. This data was used to analyze existing traffic operations in the study area. Existing plans for roadway improvements are also described in this section.

3.1 Existing Roadway System and Daily Traffic Volumes

The number of through travel lanes for existing roadways and existing intersection controls within the study area are presented on Exhibit 3-A.

Exhibits 3-B and 3-C depict the current average daily traffic (ADT) volumes in the study area on Friday and Sunday, respectively. Existing ADT volumes are estimated based upon the latest traffic data collected by Urban Crossroads, Inc. (see Appendix "A"). Peak hour data has been used to estimate the average daily traffic volumes on each leg using the following formula:

Peak Hour (Approach Volume + Exit Volume) x 12 = Leg Volume.

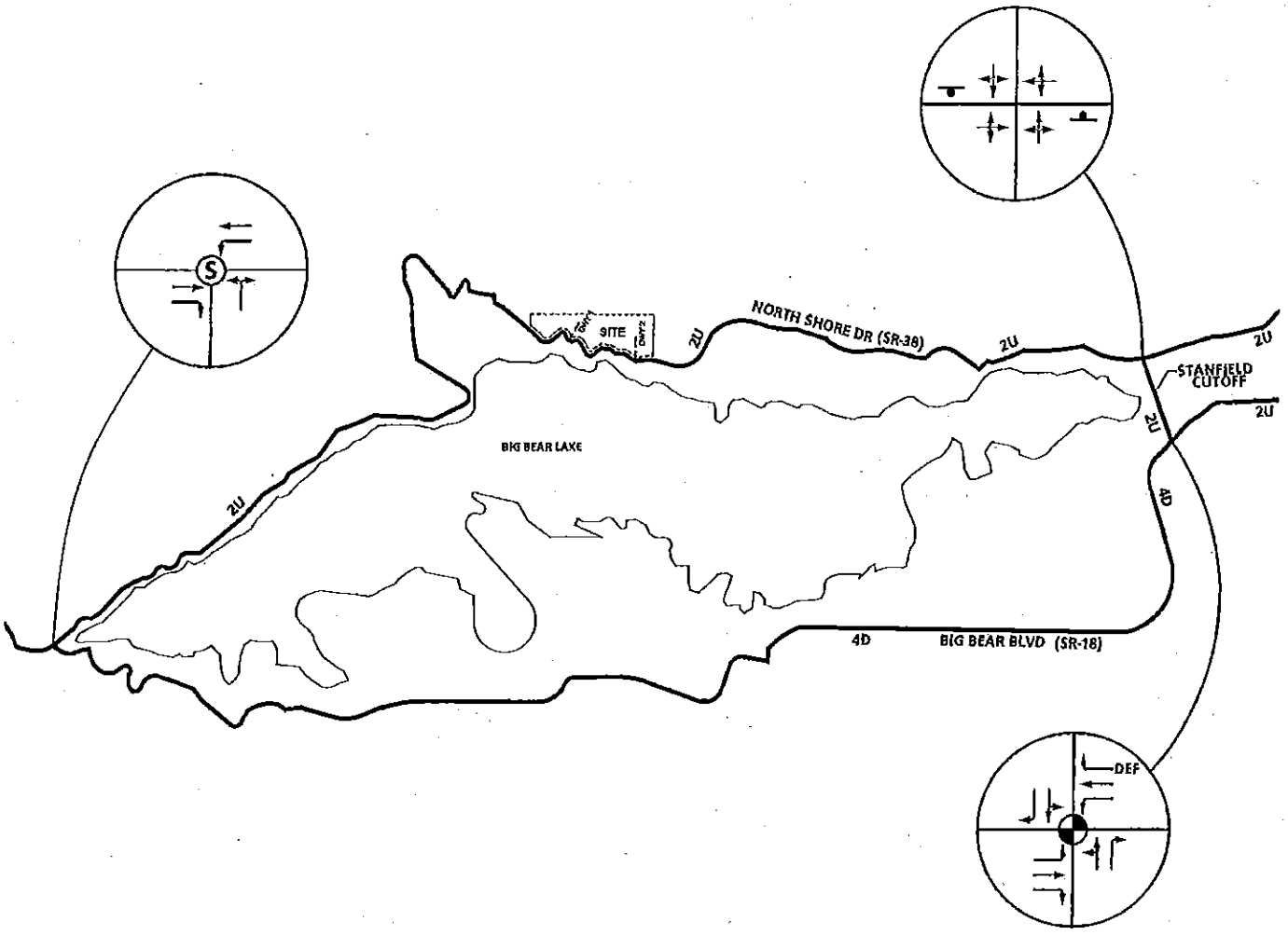
Regional access to the site is provided by North Shore Drive (SR-38)

3.2 Existing Peak Hour Traffic Volumes

Actual traffic count data was obtained from manual intersection counts (March 2007, see Appendix "A") to quantify existing traffic conditions. The Friday PM peak hour traffic volumes were determined by counting the two hour period between 4:00 PM- 6:00 PM in the evening. The Sunday Mid-day peak hour traffic volumes were identified by counting the two hour period from 12:00 PM – 2:00 PM. Per discussions with County staff, since the peak season of the study area occurs during the summer months, a 16% growth is applied to the manual intersection counts to represent existing peak hour intersection volumes.

EXHIBIT 3-A

EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



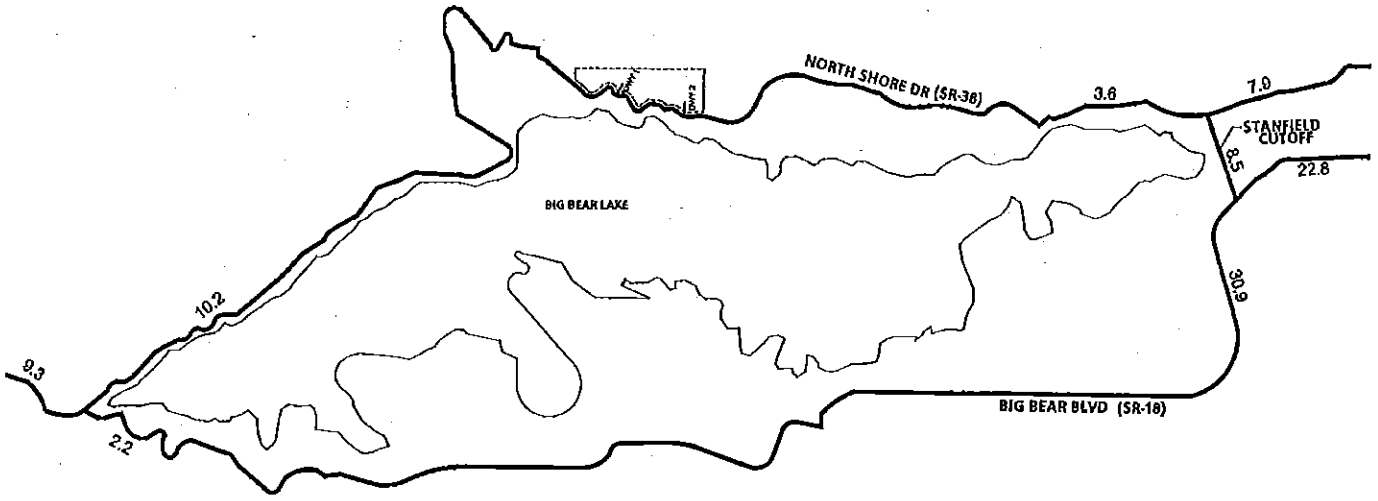
LEGEND:

- = TRAFFIC SIGNAL
- (S) = ALL WAY STOP
- = STOP SIGN
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- DEF = DEFACTO RIGHT TURN LANE

N

EXHIBIT 3-B

EXISTING FRIDAY AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

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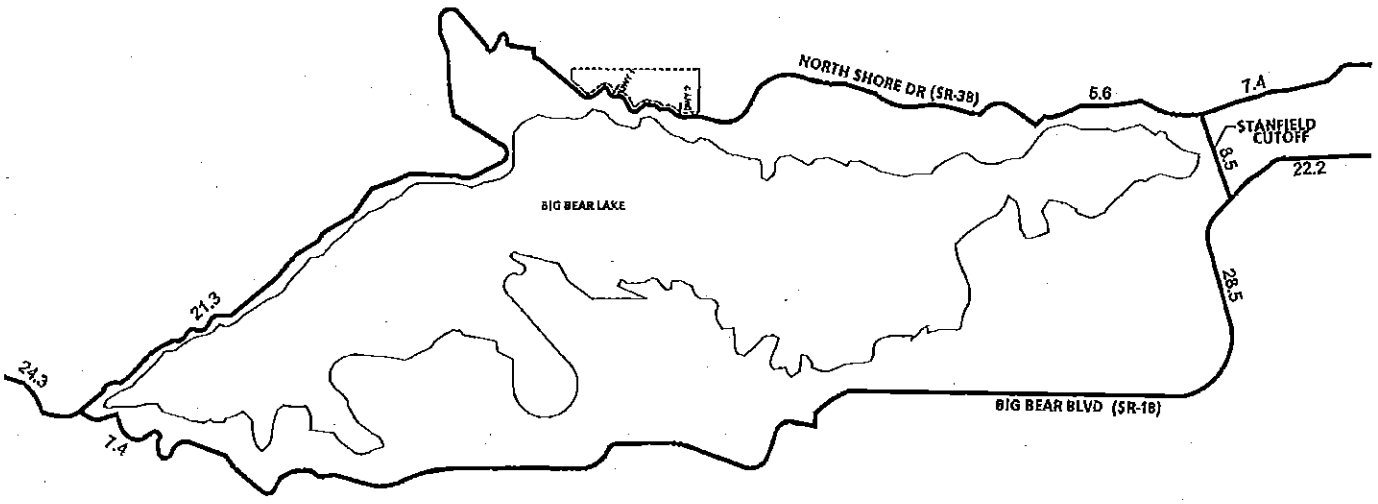
EXHIBIT 3-C

EXISTING SUNDAY AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

Existing intersection level of service calculations are based upon the adjusted manual Friday PM and Sunday Mid-day peak hour turning movement counts, as shown on Exhibits 3-D and 3-E.

3.3 Existing Traffic Operations

Existing peak hour traffic operations have been evaluated for both the Friday PM and Sunday Mid-day peak hours of traffic throughout the study area. The results of this analysis are summarized in Table 3-1, along with the existing intersection geometrics and control devices at each analysis location. As indicated in Table 3-1, the following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday Mid-day peak hours:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

The operations analysis worksheets for existing conditions are included in Appendix "B".

Traffic signal warrant analysis (included in Appendix "C") has been conducted for existing conditions and traffic signals are currently warranted at the following study area intersections:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

EXHIBIT 3-D

EXISTING FRIDAY PM PEAK HOUR INTERSECTION VOLUMES

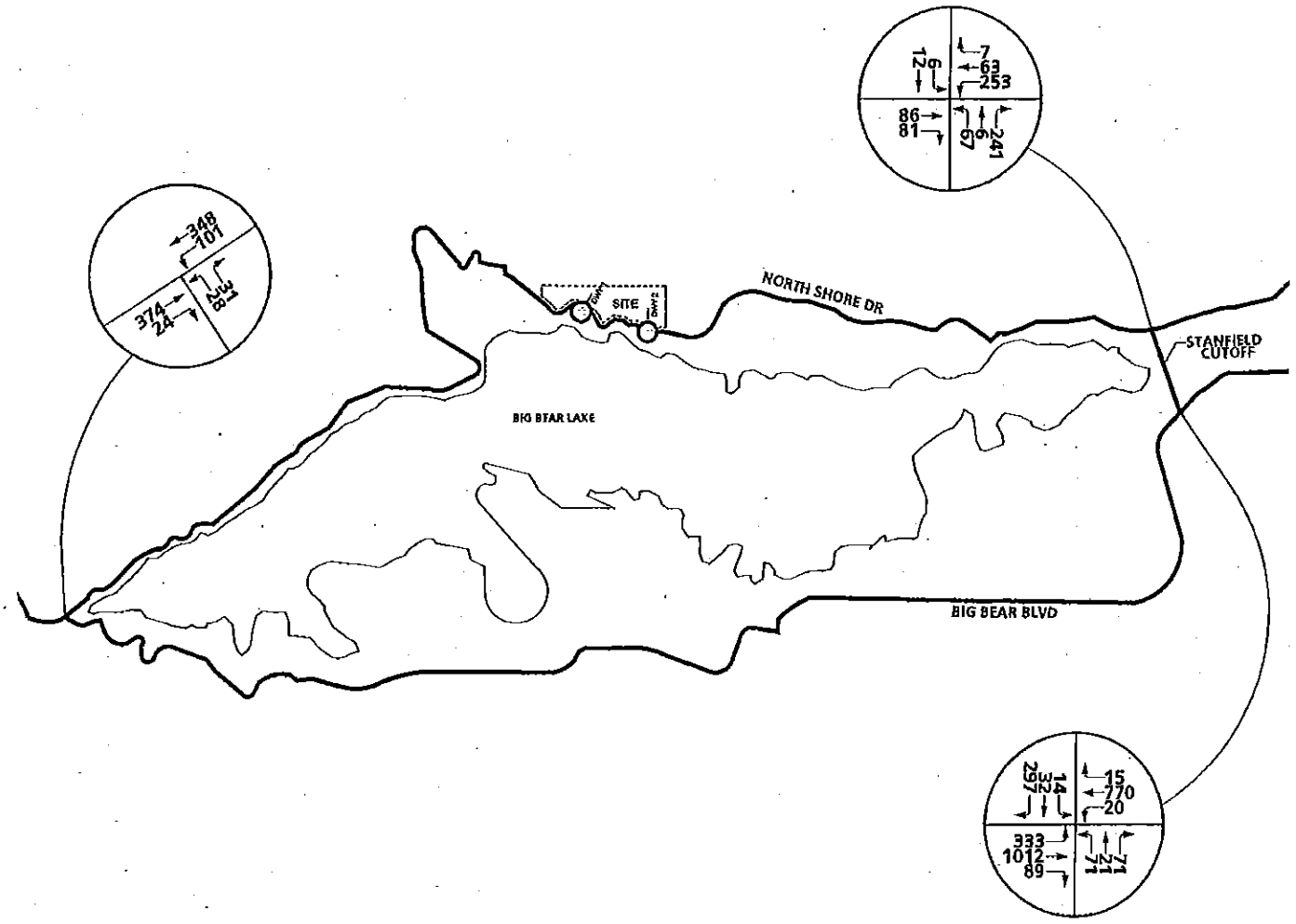


EXHIBIT 3-E

EXISTING SUNDAY MID-DAY PEAK HOUR INTERSECTION VOLUMES

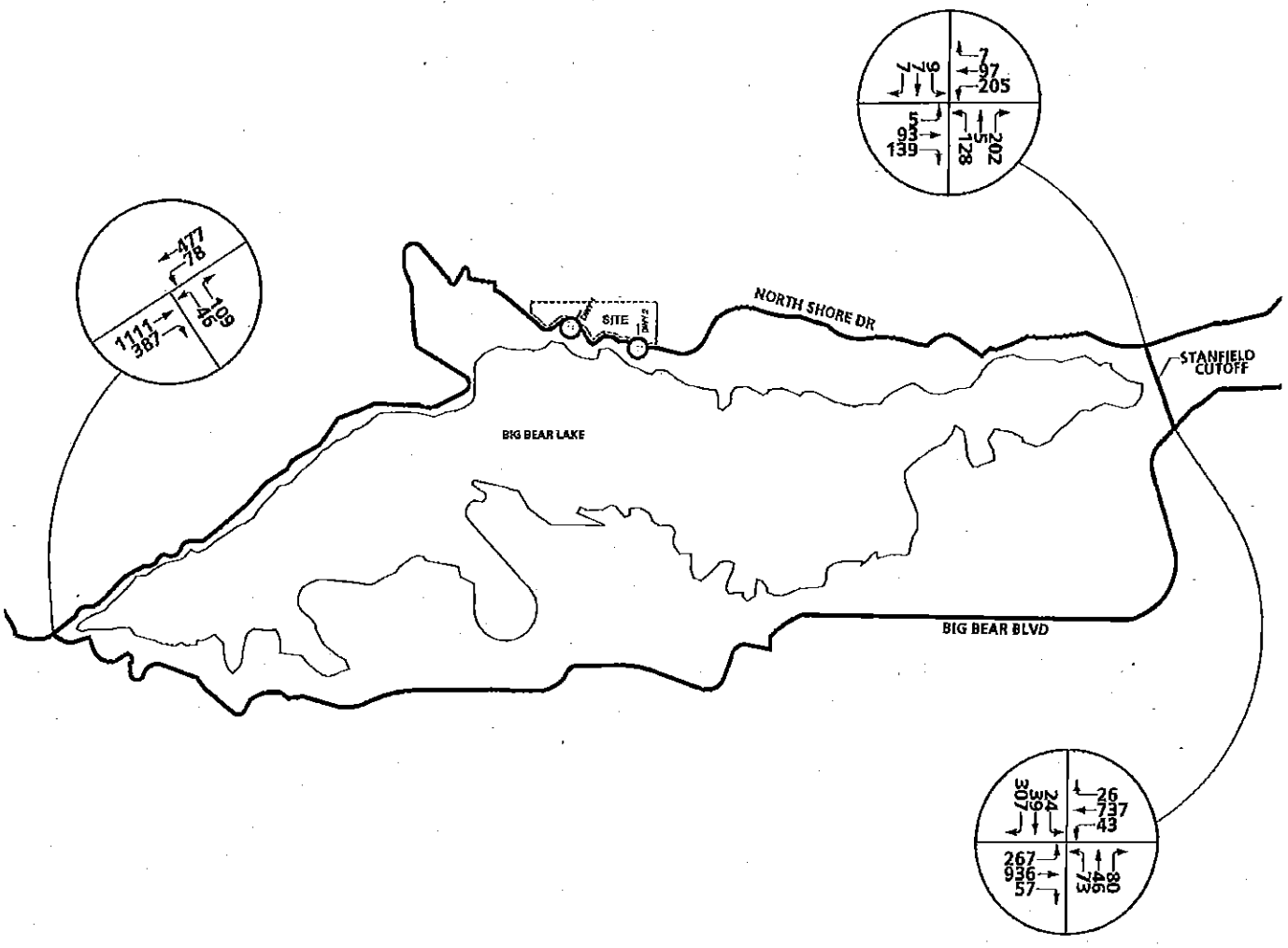


TABLE 3-1

INTERSECTION ANALYSIS FOR EXISTING CONDITIONS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	Fri. PM	Sun. MD	Fri. PM	Sun. MD
North Shore Dr. (SR-38) (NS) at:																	
• Big Bear Blvd. (SR-18) (EW)	CSS	0	1	0	0	0	0	0	1	1	1	1	0	22.5	--[4]	C	F
Stanfield Cutoff (NS) at:																	
• North Shore Dr. (SR-38) (EW)	CSS	0	1	0	0	1	0	0	1	0	0	1	0	25.5	34.5	D	D
• Big Bear Blvd. (SR-18) (EW)	TS	0	1	1	0	1	1	1	1	1	1	1	1	--[4]	81.1	F	F

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[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right;

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.8 R3 (2006). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross Street Stop

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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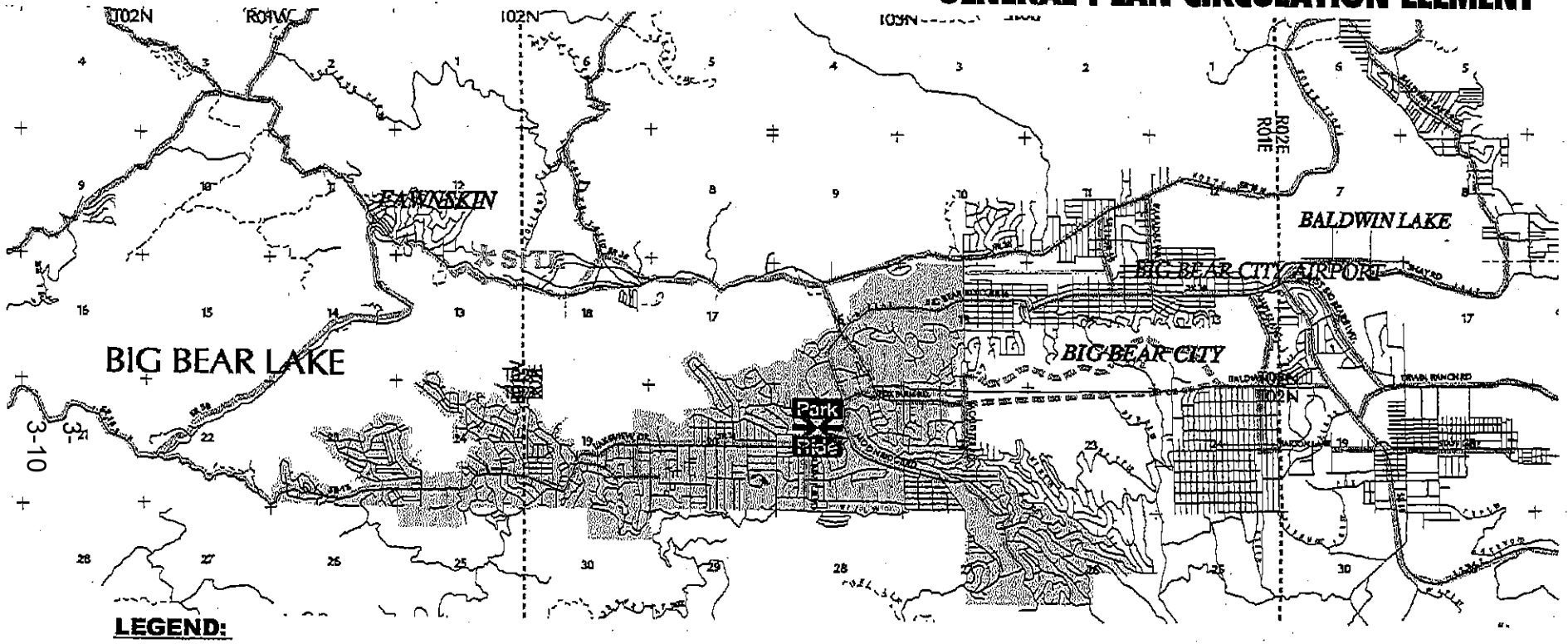
3.4 Planned Transportation Improvements and Relationships to General Plan

The long-range transportation system within the study area is expected to undergo significant improvement as a result of work to be performed by Caltrans, the County of San Bernardino, and City of Big Bear Lake. The County of San Bernardino General Plan Circulation Element and General Plan roadway cross-sections are shown on Exhibits 3-F and 3-G, respectively. The City of Big Bear Lake General Plan Circulation Element and General Plan roadway cross-sections are shown on Exhibits 3-H and 3-I, respectively.

EXHIBIT 3-F

SAN BERNARDINO COUNTY GENERAL PLAN CIRCULATION ELEMENT



LEGEND:

Circulation and Transportation

EXISTING PROPOSED

- Freeway
- Major Divided Highway
- Major Arterial Highway
- Major Highway
- Secondary Highway
- Controlled/Limited Access Collector
- Mountain Major Highway
- Mountain Secondary Highway
- State Highway (Special Standards or Conditions)
- Railroads
- Park & Ride Ridesharing Facilities

Airport Runways

Runway Location

Map data compiled on 7 and 1/2 and 1 angle maps by J. J. VanHouton and A

Positional accuracy of map data is ± 750 feet

Jurisdictional Control

Private Unincorporated Lands

- Bureau of Land Management
- National Parks and Monuments, National Forests and Wildlife Refuges
- Military Reservations (Includes U.S. Army, Navy, Air Force, and Army, Corps of Engineers)
- State, County, and Municipal Lands
- Indian Lands and Reservations
- Unclassed Water Body
- Incorporated Cities

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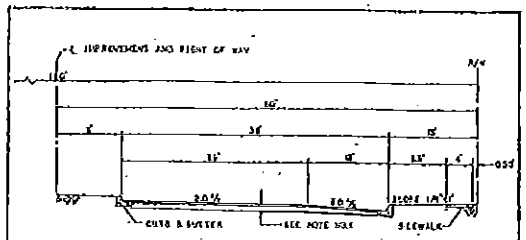
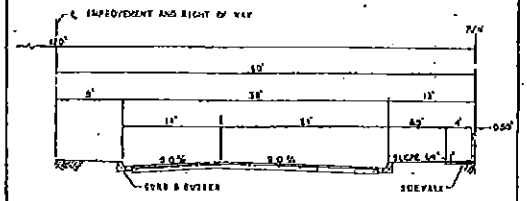
EXHIBIT 3-G

SAN BERNARDINO COUNTY GENERAL PLAN ROADWAY CROSS-SECTIONS (PAGE 1 OF 2)



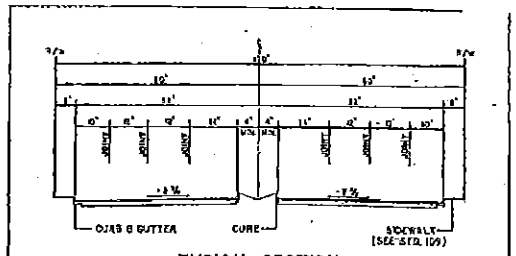
TYPICAL HALF SECTION



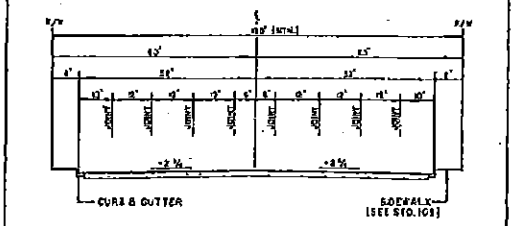
TYPICAL HALF SECTION

NOTES:
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. CONSTRUCTION OUTSIDE R/W LINE SHALL REQUIRE SLOPE EASEMENTS.

SAN BERNARDINO COUNTY ROAD DEPARTMENT			
	KEN A. MILLER Director of Transportation	MAJOR DIVIDED HIGHWAY	100



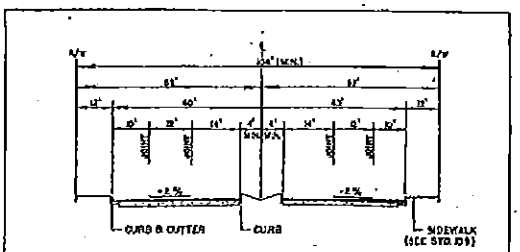
TYPICAL SECTION
WITH RAISED MEDIAN



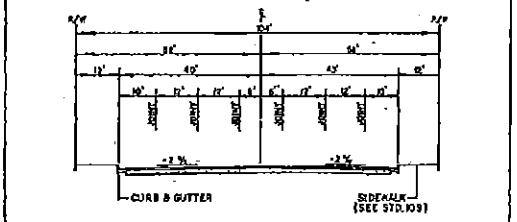
TYPICAL SECTION
WITH CONTINUOUS LEFT TURN LANE

NOTES:
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. DRAINAGE FACILITIES SHALL BE PROVIDED TO DRAIN RAISED MEDIAN AREAS.
3. 8' SHOULDER AREAS MAY BE DESIGNATED AS A BIKE LANE AND EMERGENCY PARKING ONLY.

SAN BERNARDINO COUNTY TRANSPORTATION DEPARTMENT			
	JOHN R. SHOHE DIRECTOR OF TRANSPORTATION	MAJOR ARTERIAL	100 A



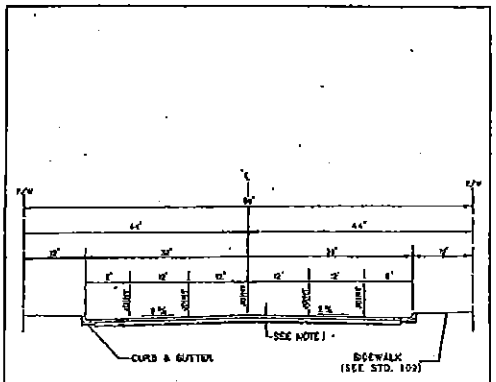
TYPICAL SECTION
WITH RAISED MEDIAN



TYPICAL SECTION
WITH CONTINUOUS LEFT TURN LANE

NOTES:
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. DRAINAGE FACILITIES SHALL BE PROVIDED TO DRAIN RAISED MEDIAN AREAS.
3. 8' SHOULDER AREAS MAY BE DESIGNATED AS A BIKE LANE AND EMERGENCY PARKING ONLY.

SAN BERNARDINO COUNTY TRANSPORTATION DEPARTMENT			
	JOHN R. SHOHE	MAJOR HIGHWAY	101



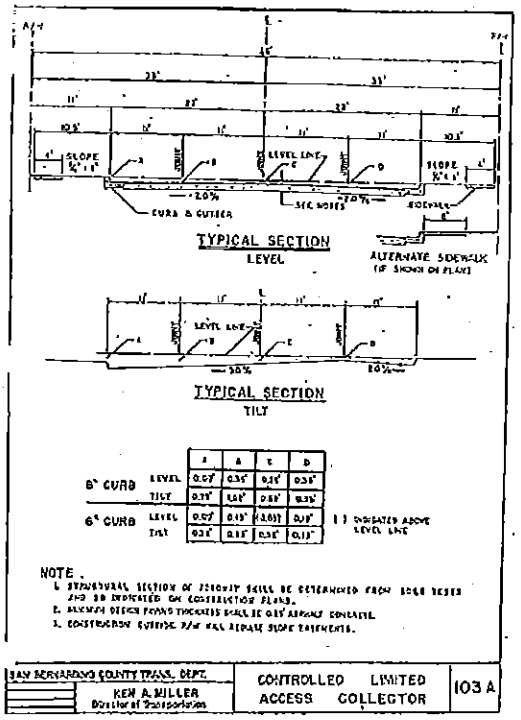
TYPICAL SECTION

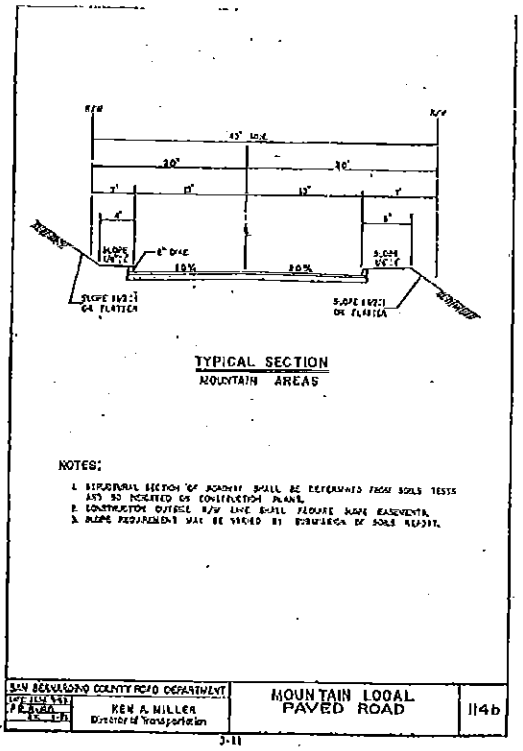
NOTES:
1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED FROM SOILS TESTS AND SO INDICATED ON CONSTRUCTION PLANS.
2. 8' SHOULDER AREAS MAY BE DESIGNATED AS A BIKE LANE AND EMERGENCY PARKING ONLY.

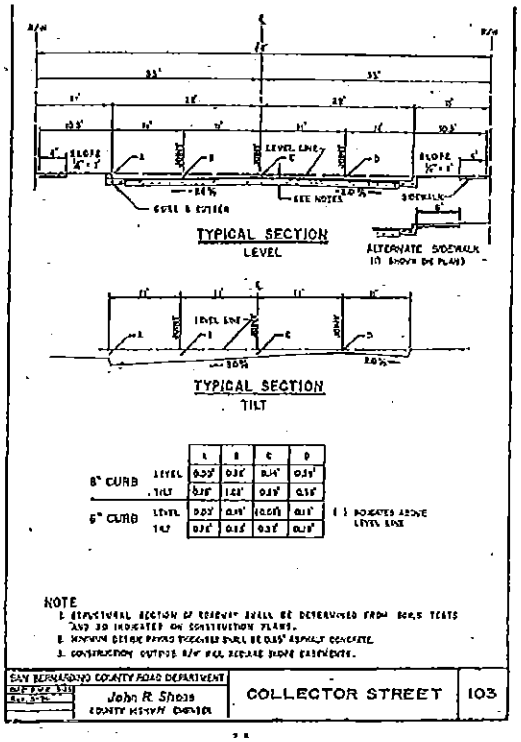
SAN BERNARDINO COUNTY TRANSPORTATION DEPARTMENT			
	JOHN R. SHOHE DIRECTOR OF TRANSPORTATION	SECONDARY HIGHWAY	102

EXHIBIT 3-G

SAN BERNARDINO COUNTY GENERAL PLAN ROADWAY CROSS-SECTIONS (PAGE 2 OF 2)







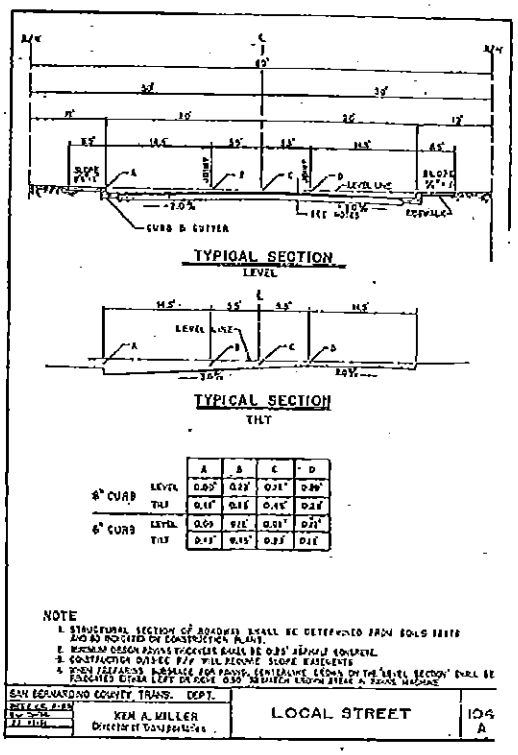
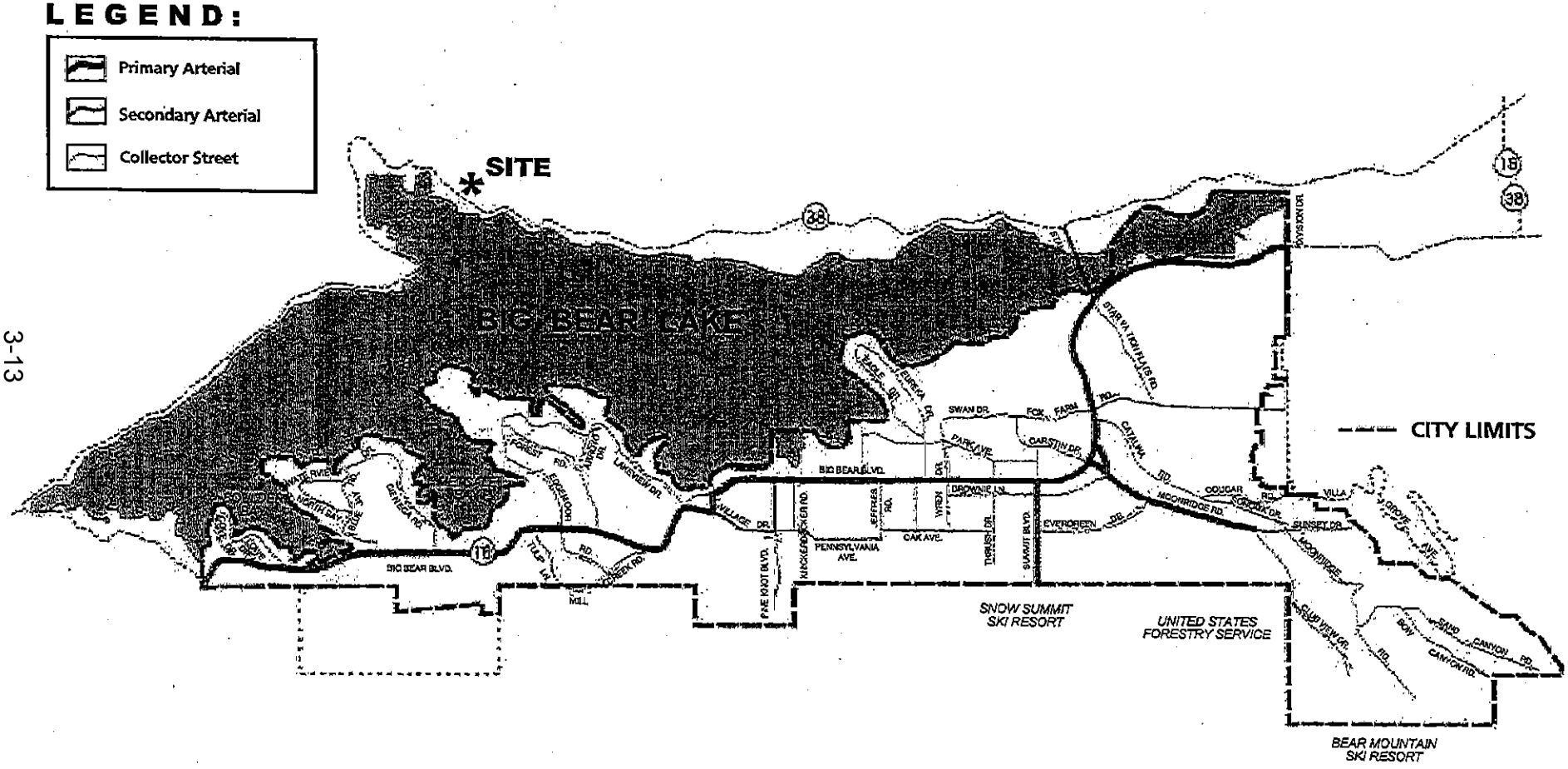


EXHIBIT 3-H

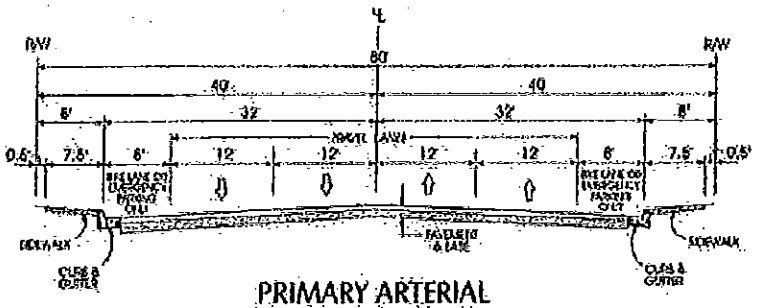
CITY OF BIG BEAR LAKE
GENERAL PLAN CIRCULATION ELEMENT



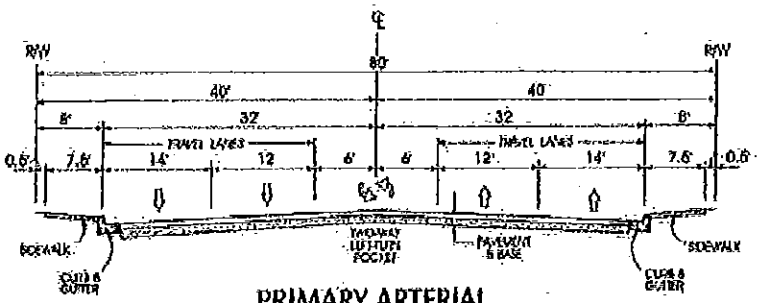
URBAN

EXHIBIT 3-I

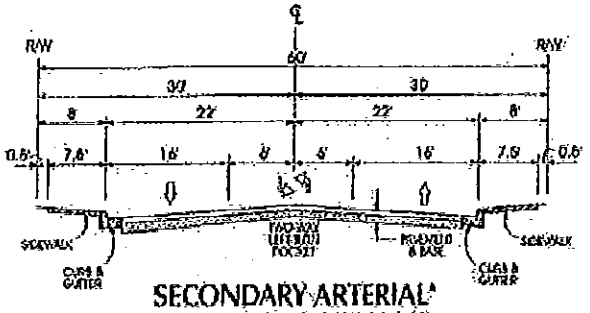
CITY OF BIG BEAR LAKE GENERAL PLAN ROADWAY CROSS-SECTIONS (PAGE 1 OF 2)



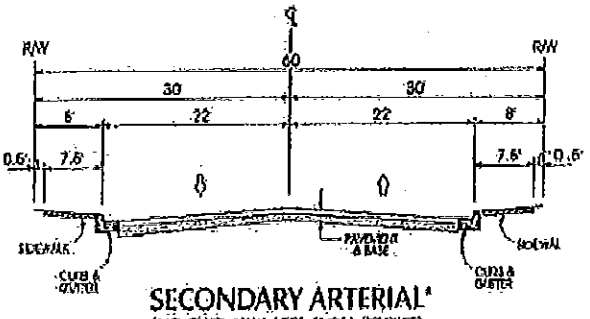
PRIMARY ARTERIAL
(WITH BIKE LANES OR EMERGENCY PARKING)
TYPICAL SECTION



PRIMARY ARTERIAL
(WITH TWO-WAY LEFT-TURN POCKET)
TYPICAL SECTION



SECONDARY ARTERIAL*
(WITH TWO-WAY LEFT-TURN POCKET)
TYPICAL SECTION

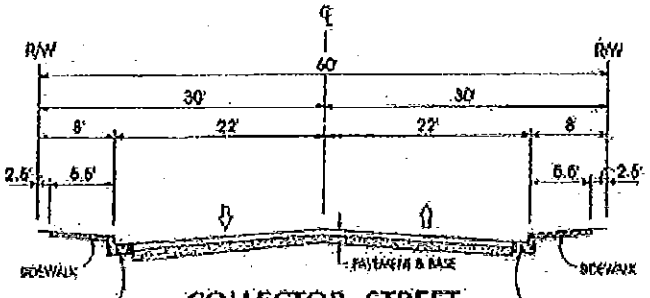


SECONDARY ARTERIAL*
(NO TWO-WAY LEFT-TURN POCKET)
TYPICAL SECTION

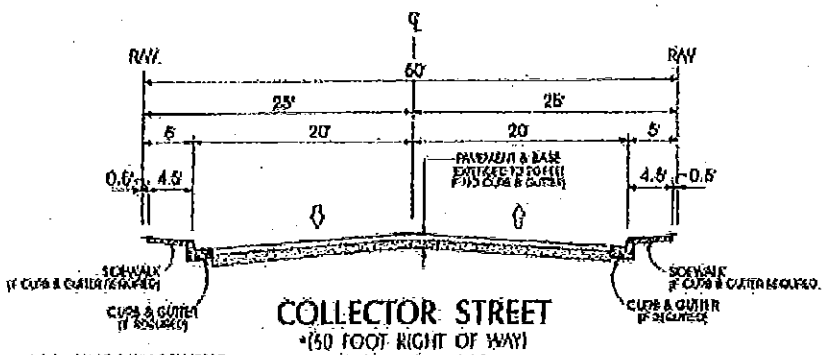
*THESE CROSS SECTIONS MAY BE MODIFIED BASED UPON ADOPTED SPECIFIC PLANS OR EXISTING CONDITIONS

EXHIBIT 3-I

CITY OF BIG BEAR LAKE
GENERAL PLAN ROADWAY CROSS-SECTIONS
(PAGE 2 OF 2)

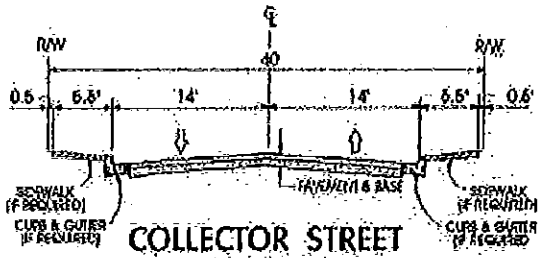


COLLECTOR STREET
(60 FOOT RIGHT OF WAY)
TYPICAL SECTION

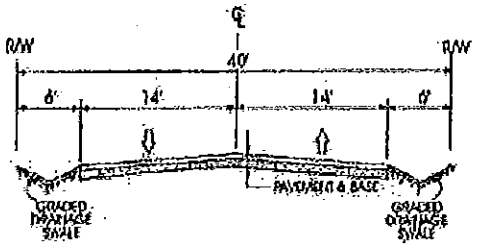


COLLECTOR STREET
*(50 FOOT RIGHT OF WAY)
TYPICAL SECTION

*ACCEPTABLE ONLY IF EXISTING DEVELOPMENT PRECLUDES A 60 FOOT RIGHT OF WAY.



COLLECTOR STREET
*(40 FOOT RIGHT OF WAY)
TYPICAL SECTION



COLLECTOR STREET
with no curb and gutter
*(60 FOOT RIGHT OF WAY)
TYPICAL SECTION

*ACCEPTABLE ONLY IF EXISTING DEVELOPMENT PRECLUDES A 60 FOOT RIGHT OF WAY.

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4.0 FUTURE DAILY TRAFFIC CONDITIONS

This chapter of the report describes the development of the future year traffic volume forecasts and presents the resulting daily traffic volumes which will be used for traffic operations analysis. Future traffic conditions without the project are presented first, followed by the future with project traffic volumes. Traffic signal warrant analysis for future conditions has also been presented in this chapter.

4.1 Future With and Without Project Traffic Conditions

Per discussion with County staff, the areawide growth has been interpolated from adjusted existing volumes (with 16% growth) to General Plan Buildout (2030) volumes. The areawide growth varies for each movement at each intersection (see Appendix "D"). The interpolated area-wide growth rate has been added to peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the project and other development.

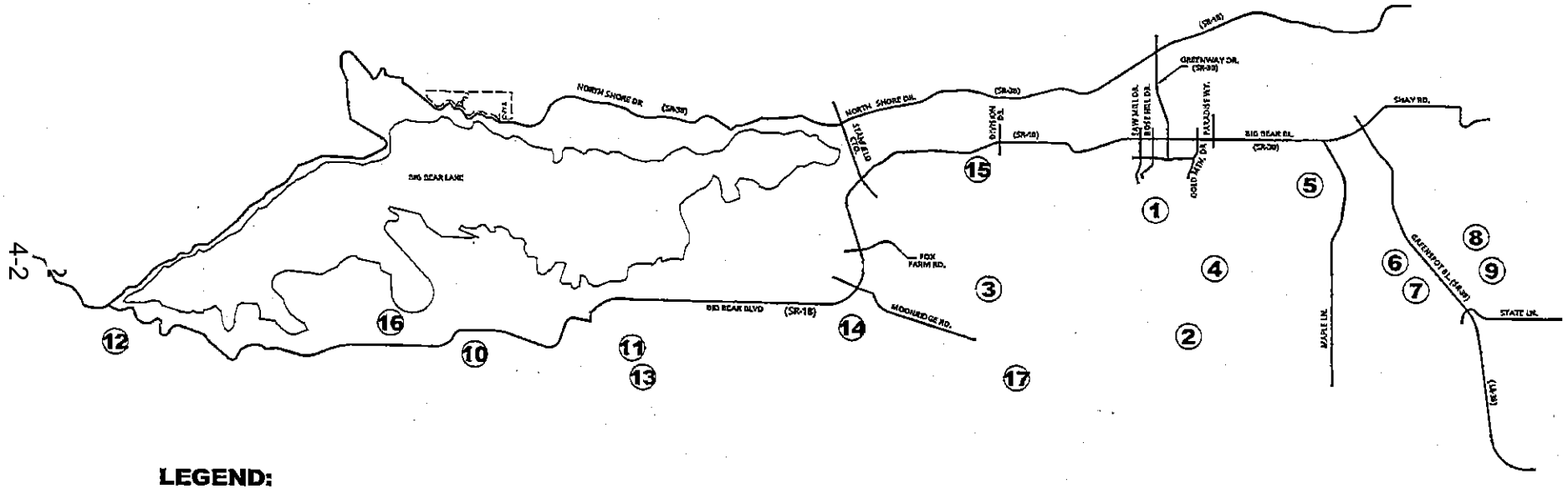
Long Range General Plan Buildout (2030) conditions have been estimated based on a select zone run of the San Bernardino Mountain Model, in addition to traffic generated by the project and the known cumulative development.

The County of San Bernardino was contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on information given by the County of San Bernardino and City of Big Bear staff, a total of 17 cumulative projects were identified to affect the study intersections. The location of each of these other developments is shown on Exhibit 4-A.

As indicated in Table 4-1, other developments are projected to generate 15,111 trip-ends per day with 1,455 vehicles per hour during the AM peak hour and 1,455 vehicles per hour during the PM peak hour. Appendix "D" contains the

EXHIBIT 4-A

OTHER DEVELOPMENT LOCATION MAP



LEGEND:

1. = TT 16771
2. = TT 16934
3. = TT 17217 & TPM 17022
4. = TT 16036
5. = TT 14916
6. = TT 16980
7. = TT 17764
8. = TT 16749
9. = TT 17201
10. = HILTON GARDEN INN
11. = MIXED USE DEVELOPMENT
12. = RESIDENTIAL LOTS
13. = CONDOMINIUMS
14. = 41820 BIG BEAR BLVD
15. = WORLD HARVEST FAITH CENTER
16. = BOAT PARTS RETAIL & SERVICE
17. = STORAGE YARD

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URBAN

TABLE 4-1
FRIDAY PM PEAK HOUR/SUNDAY MIDDAY PEAK HOUR

OTHER DEVELOPMENT TRIP GENERATION

ID #	PROJECT NAME	LAND USE[1]	QUANTITY	UNITS[2]	PEAK HOUR						DAILY
					FRIDAY PM			SUNDAY MIDDAY			
					IN	OUT	TOTAL	IN	OUT	TOTAL	
SAN BERNARDINO COUNTY											
1	TT 16771[3]	SFR	242	DU	155	90	245	155	90	245	2,316
2	TT 16934[4]	SFR	228	DU	146	84	230	146	84	230	2,182
3	TT 17217 & TT 17022[4]	SFR	53	DU	34	20	54	34	20	54	507
4	TT 16036	SFR	116	DU	74	43	117	74	43	117	1,110
5	TT 14916	SFR	51	DU	33	19	52	33	19	52	488
6	TT 16980	SFR	15	DU	10	6	16	10	6	16	144
7	TT 1776H	SFR	10	DU	6	4	10	6	4	10	96
8	TT 16749	SFR	86	DU	55	32	87	55	32	87	823
9	TT 17201	SFR	66	DU	42	24	66	42	24	66	632
	TOTAL (COUNTY OF SAN BERNARDINO)				555	322	877	555	322	877	8,298
CITY OF BIG BEAR											
10	Hilton Garden Inn	Hotel	91	ROOMS	28	25	53	28	25	53	743
11	Mixed Use Development	Retail	22.5	TSF	112	122	234	112	122	234	2,575
		Less Pass-By (15%)			-17	-18	-35	-17	-18	-35	-386
		Subtotal Commercial			95	104	199	95	104	199	2,189
		Office	6.3	TSF	1	5	6	1	5	6	69
		SFR	10	DU	6	4	10	6	4	10	96
	Sub-Total				102	113	215	102	113	215	2,354
12	Residential Lots	SFR	8	DU	5	3	8	5	3	8	77
13	Condominiums	MFDU	78	DU	27	13	40	27	13	40	457
14	41820 Big Bear Blvd.	Hotel	55	ROOMS	17	15	32	17	15	32	449
		Retail	10	TSF	66	71	137	66	71	137	1,520
		Fast-Food	2.6	TSF	45	42	87	45	42	87	1,240
		Less Pass-By (15%)			-17	-17	-34	-17	-17	-34	-414
		Subtotal Commercial			94	96	190	94	96	190	2,346
	Sub-Total				111	111	222	111	111	222	2,795
15	World Harvest Faith Center	Church	20	TSF	7	6	13	7	6	13	182
16	Boat Parts Retail & Service	Auto Care Center	4.375	TSF	7	7	14	7	7	14	88
17	Storage Yard	Mini Warehouse	3	AC	6	6	12	6	6	12	117
	TOTAL (CITY OF BIG BEAR)				294	284	578	294	284	578	6,813
	TOTAL				**849**	**606**	**1,455**	**849**	**606**	**1,455**	**15,111**

[1] SFR = Single Family Residential
[2] DU = Dwelling Unit
TSF= Thousand Square Feet
AC = Acres

[3] Source: TT 16771 Traffic Impact Analysis, County of San Bernardino, Urban Crossroads, Inc. July 2006

[4] Source: TT 17217 and TT 17022 Traffic Impact Analysis, County of San Bernardino, Urban Crossroads, Inc. July 2006

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directional distribution and assignment of the other development traffic. Based on the identified trip distribution for the other development on arterial highways throughout the study area, other development average daily traffic (ADT) and Friday PM/Sunday Mid-day peak hour intersection turning movement volumes (based on PM peak hour trip generation) are shown on Exhibits 4-B and 4-C, respectively.

Project traffic volumes on study area roadway segments are determined by generating project trips and manually routing the traffic through the roadway network. The routing patterns follow the trip distributions which were previously presented in Section 2. Trips are assigned to each individual roadway link and intersection occurring along a specific route.

The accumulation of traffic assigned to each roadway link represents the project traffic volume for that link. Project only ADT volumes were previously presented in Section 2.

4.1.1 2010 Without Project Daily Traffic Volumes

The ADT's for 2010 Without Project traffic conditions have been determined by adding the 2007 existing traffic volumes (with 16% adjustment) plus the 2% background growth volumes per year (6% for three years) plus the known cumulative development volumes. 2010 Friday ADT and Sunday ADT volumes for without project traffic conditions are shown on Exhibit 4-D and 4-E, respectively.

For 2010 Without Project traffic conditions, no new traffic signals are projected to be warranted (see Appendix "C"), compared to Existing Conditions.

EXHIBIT 4-B

OTHER DEVELOPMENT AVERAGE DAILY TRAFFIC

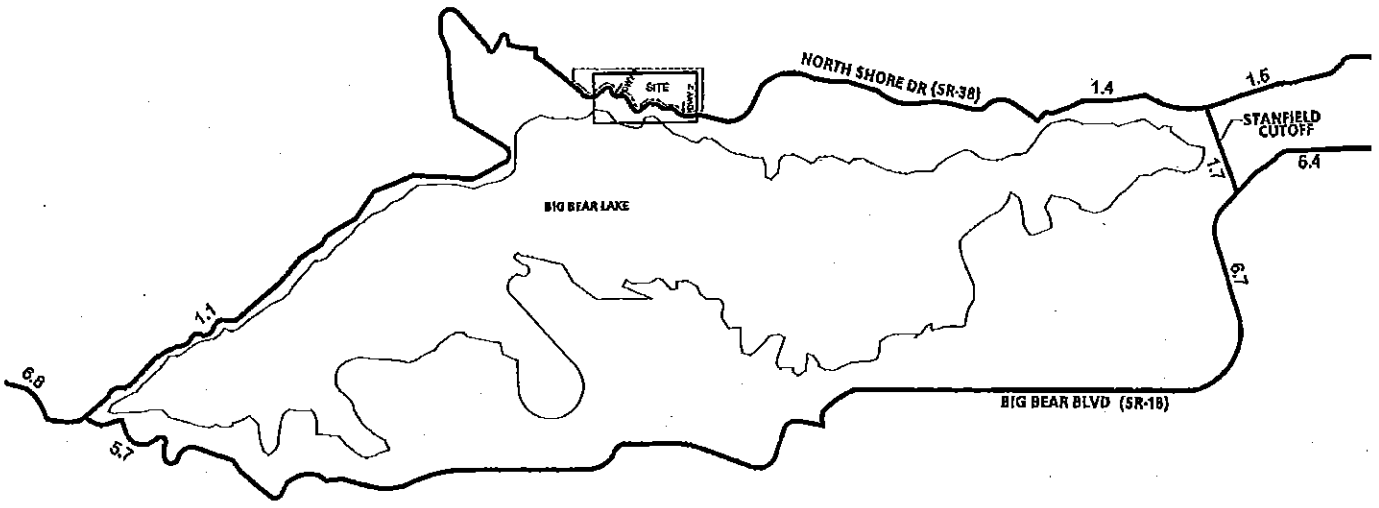

EXHIBIT 4-C

OTHER DEVELOPMENT FRIDAY PM PEAK HOUR/ SUNDAY MIDDAY PEAK HOUR INSTERSECTION VOLUMES

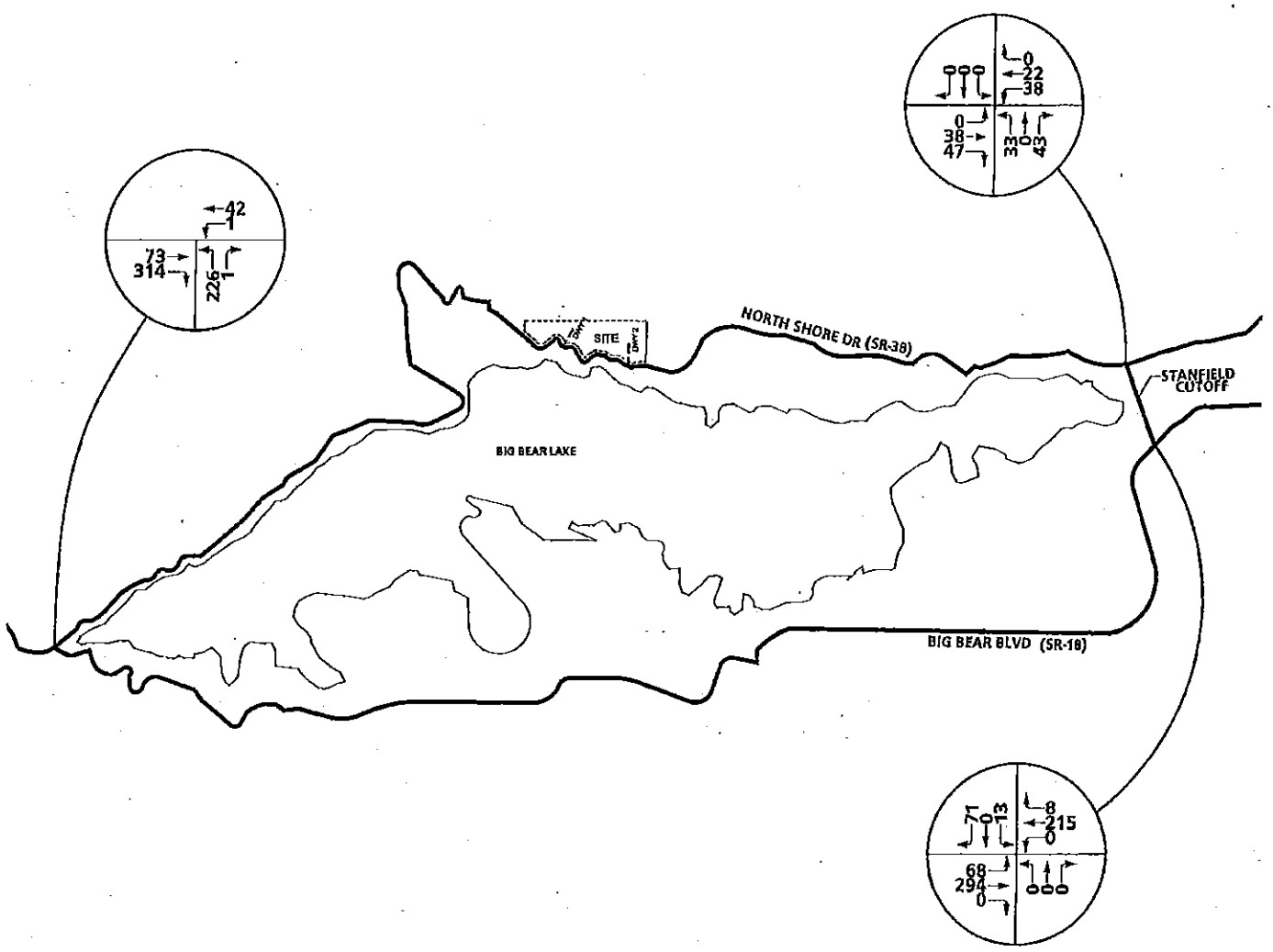

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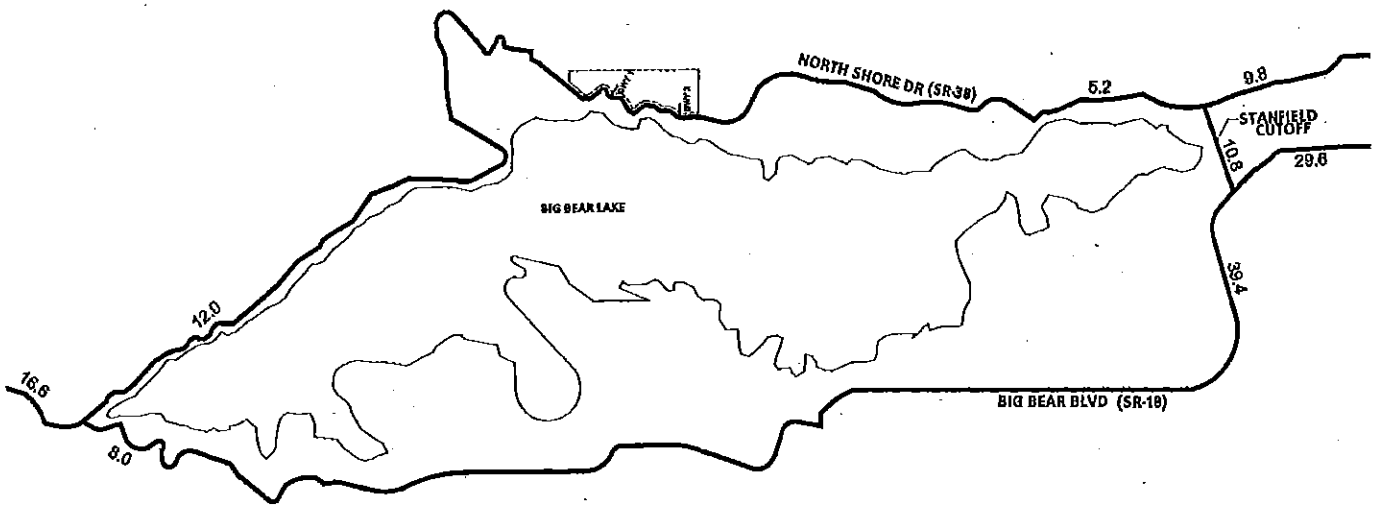
EXHIBIT 4-D

2010 WITHOUT PROJECT FRIDAY AVERAGE DAILY TRAFFIC



LEGEND:

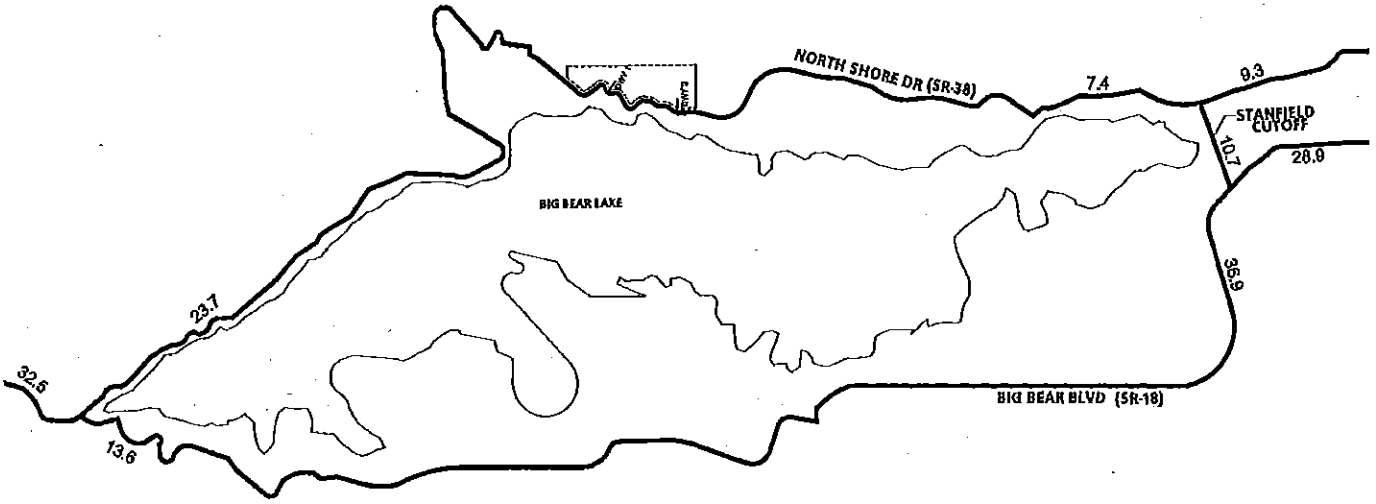
10.0 = VEHICLES PER DAY (1000'S)

N

URBAN CROSSROADS

EXHIBIT 4-E

2010 WITHOUT PROJECT SUNDAY AVERAGE DAILY TRAFFIC



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

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URBAN CROSSROADS

4.1.2 2010 With Project Daily Traffic Volumes

The ADT's for the 2010 With Project have been determined by adding the project only traffic volumes to the 2010 Without Project traffic volumes. 2010 Friday and Sunday ADT volumes with the project traffic are shown on Exhibit 4-F and 4-G, respectively.

For 2010 With Project traffic conditions, no new traffic signals are projected to be warranted (see Appendix "C"), as compared to 2010 Without Project conditions.

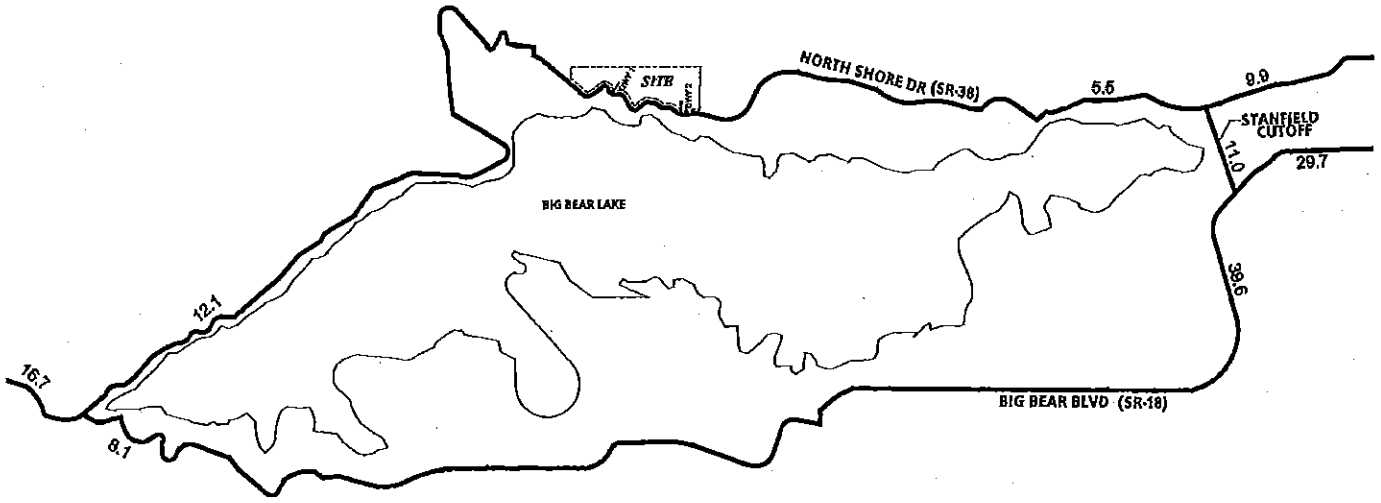
4.1.3 General Plan Buildout (2030) Daily Traffic Volumes

The ADT's for General Plan Buildout (2030) conditions have been determined by adding the project only and other cumulative development traffic volumes to the 2030 ADT volumes derived from the San Bernardino Mountain Model. General Plan Buildout Without Project (2030) Winter Friday and Sunday ADT volumes are shown on Exhibits 4-H and 4-I, respectively. Based on the San Bernardino Mountain Model for General Plan Buildout (2030), the peak season is shown to be winter. Therefore, the winter ADT results were used for post-processing peak hour turning volumes and level of service analysis to achieve a conservative analysis. General Plan Buildout With Project (2030) Winter Friday and Sunday ADT volumes are shown on Exhibits 4-J and 4-K, respectively.

For General Plan Buildout With Project (2030) traffic conditions, no new traffic signals are projected to be warranted (see Appendix "C") at study area analysis intersections.

EXHIBIT 4-F

2010 WITH PROJECT FRIDAY AVERAGE DAILY AVERAGE TRAFFIC



LEGEND:

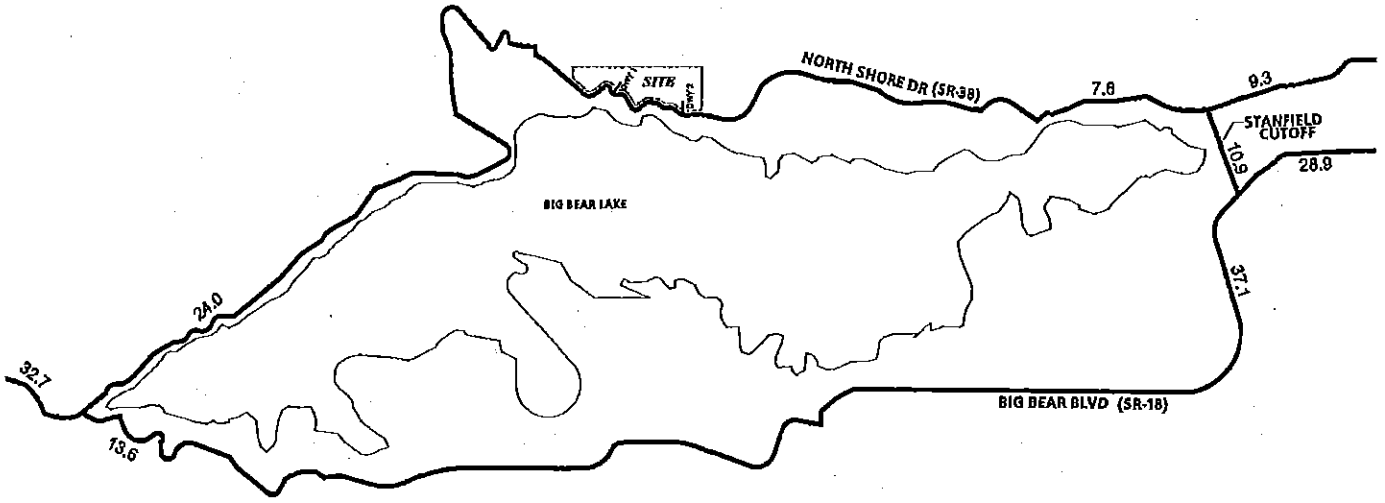
10.0 = VEHICLES PER DAY (1000'S)

N

URBAN CROSSROADS

EXHIBIT 4-G

2010 WITH PROJECT SUNDAY AVERAGE DAILY TRAFFIC



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

URBAN CROSSROADS

EXHIBIT 4-H

GENERAL PLAN BUILDOUT (2030) WINTER FRIDAY AVERAGE DAILY TRAFFIC

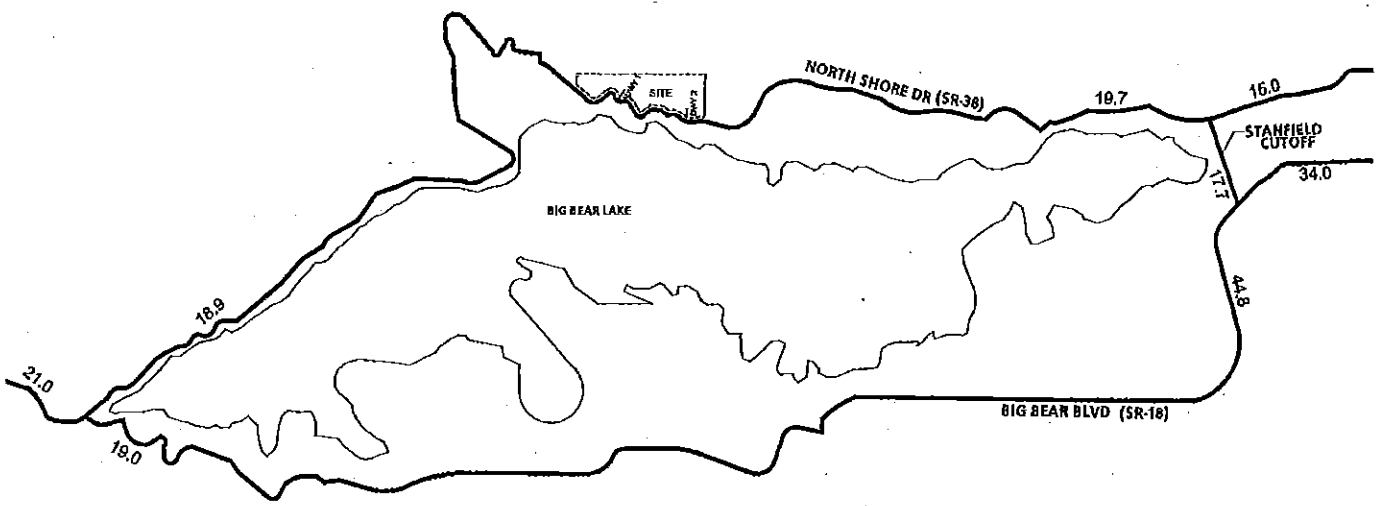


EXHIBIT 4-I

GENERAL PLAN BUILDOUT (2030) WINTER SUNDAY AVERAGE DAILY TRAFFIC (ADT)

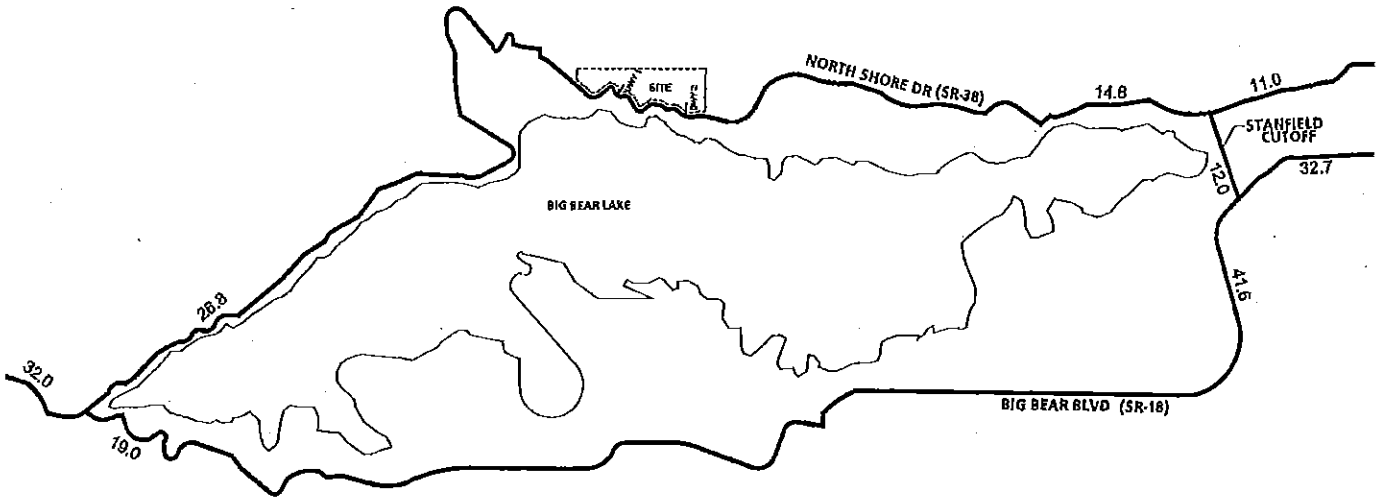
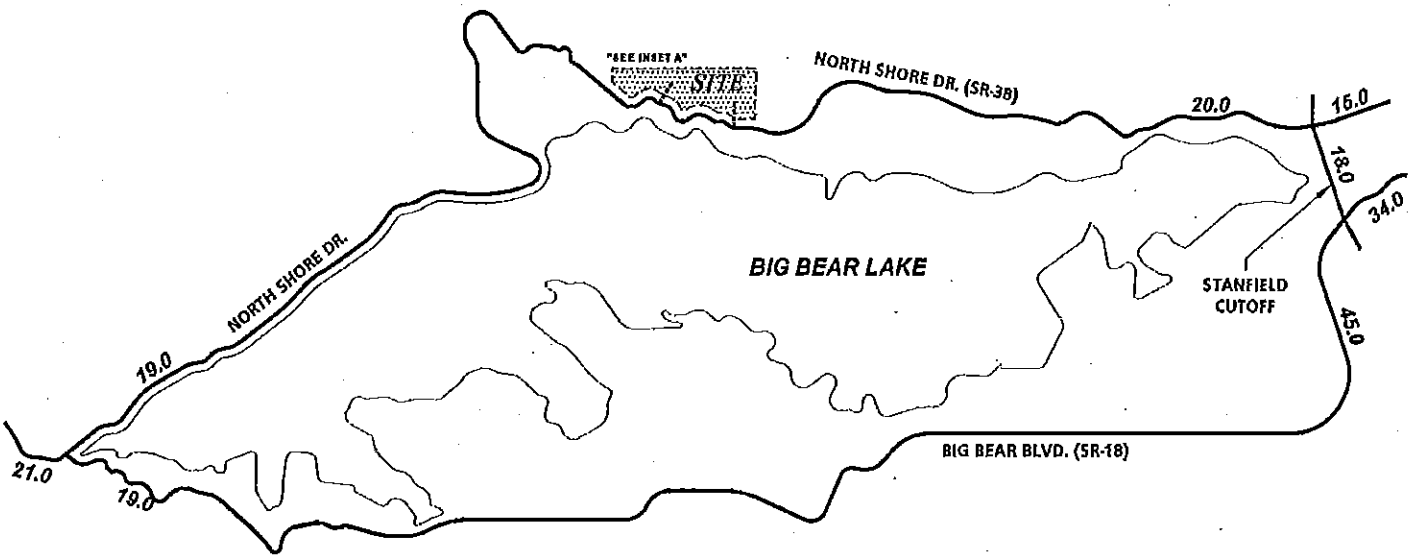
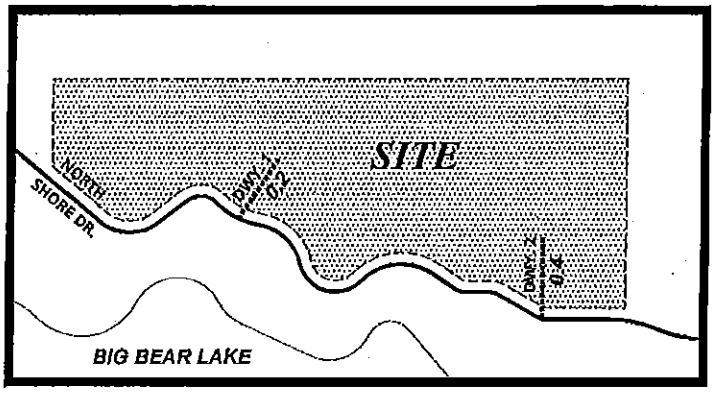


EXHIBIT 4-J

GENERAL PLAN BUILDOUT WITH PROJECT (2030) WINTER FRIDAY AVERAGE DAILY TRAFFIC



INSET A



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

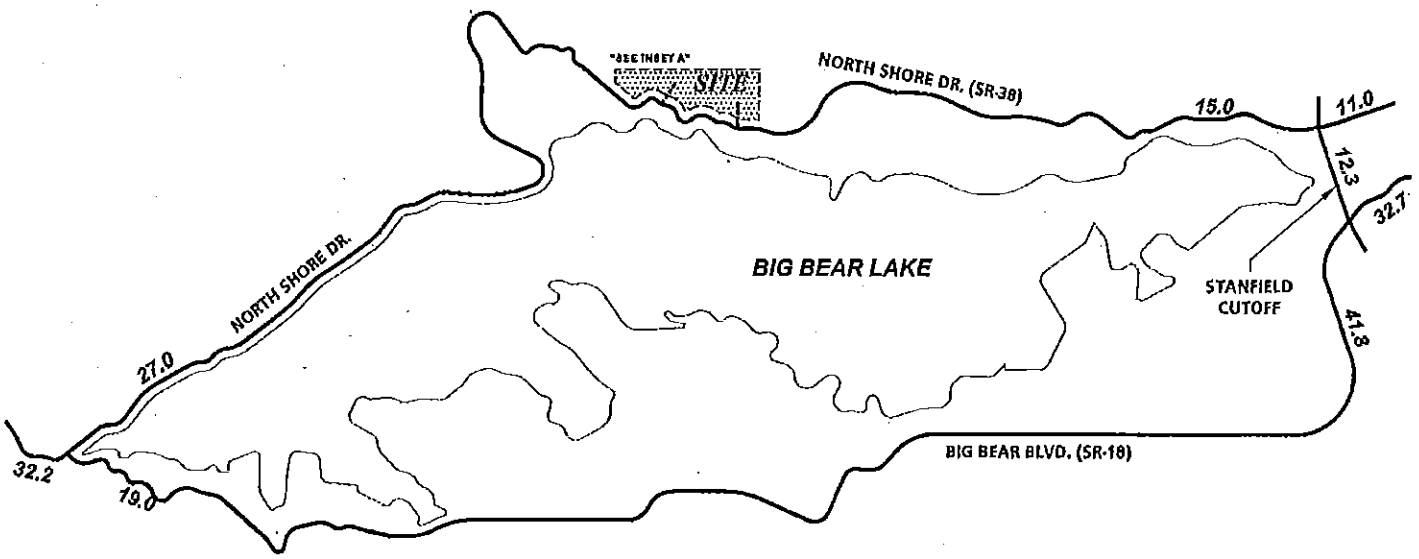
N

MOON CAMP TIA, San Bernardino County, California - 04409: 29A (REVISED)

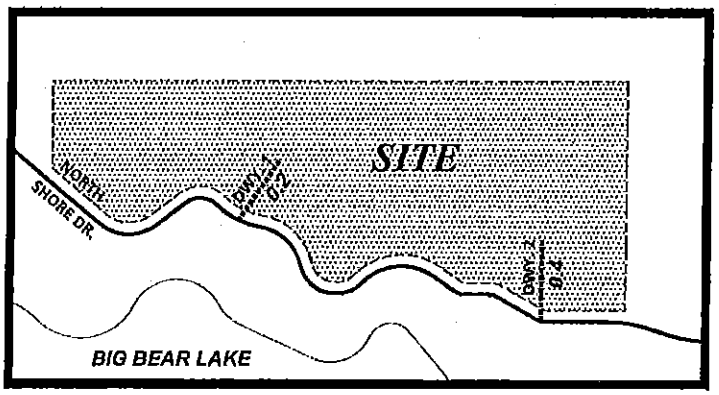
URBAN CROSSROADS

EXHIBIT 4-K

GENERAL PLAN BUILDOUT WITH PROJECT (2030) WINTER SUNDAY AVERAGE DAILY TRAFFIC



INSET A



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

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5.0 FUTURE TRAFFIC OPERATIONS ANALYSIS

This section of the report presents the operations analysis for the traffic volume forecasts for future traffic conditions without the project and for future traffic conditions with the project. The analysis procedures conform to the requirements of the County of San Bernardino CMP. The operations analysis for each analysis year is presented in a separate subsection.

5.1 Future Interim Year Traffic Operations

5.1.1 2010 Without Project Conditions

The intersection operations analysis for 2010 Without Project traffic conditions are summarized in Table 5-1, based on the geometrics analysis at the study area intersections, without and with improvements. 2010 Without Project Friday PM and Sunday Mid-day peak hour intersection turning movement volumes are shown on Exhibits 5-A and 5-B, respectively. As shown in Table 5-1, the following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday Mid-day peak hours:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

The operations analysis worksheets for 2010 Without Project conditions are included in Appendix "E".

TABLE 5-1

INTERSECTION ANALYSIS FOR 2010 WITHOUT PROJECT CONDITIONS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	Fri. PM	Sun. MD	Fri. PM	Sun. MD
North Shore Dr. (SR-38) (NS) at:																	
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	CSS	0	1	0	0	0	0	0	1	1	1	1	0	--[4]	--[4]	F	F
- With Improvements	TS	1	0	1	0	0	0	0	2	1	1	1	0	14.0	21.2	B	C
Stanfield Cutoff (NS) at:																	
• North Shore Dr. (SR-38) (EW)																	
- Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	--[4]	--[4]	F	F
- With Improvements	TS	1	1	0	1	1	0	1	1	0	1	1	0	31.9	30.7	C	C
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	TS	0	1	1	0	1	1	1	1	1	1	1	1	--[4]	--[4]	F	F
- With Improvements	TS	1	1	0	1	1	0	1	2	0	1	2	0	31.4	20.6	C	C

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1 = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.8 R3 (2006). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross Street Stop
AWS = All Way Stop

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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EXHIBIT 5-A

2010 WITHOUT PROJECT FRIDAY PM PEAK HOUR INTERSECTION VOLUMES

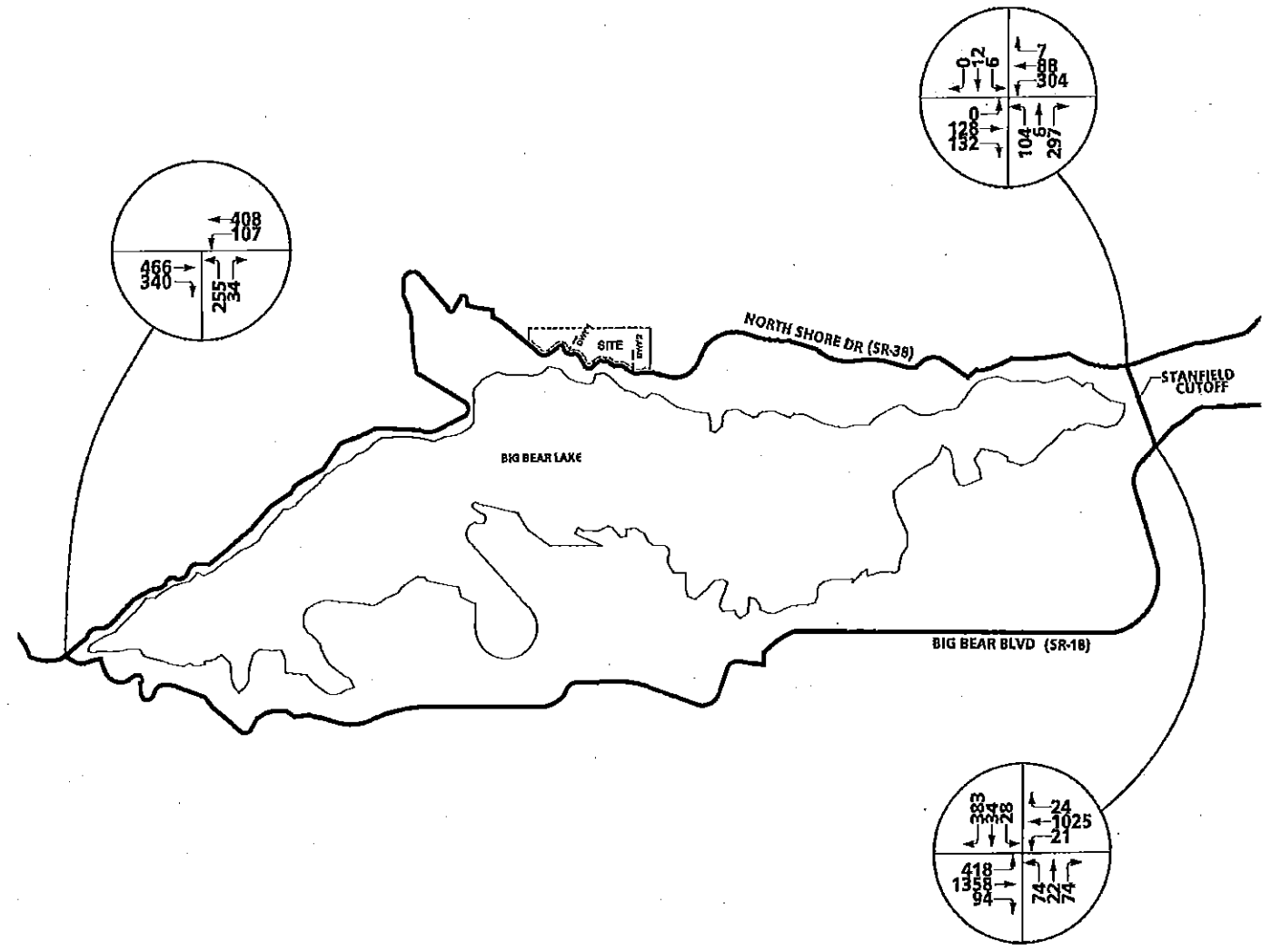
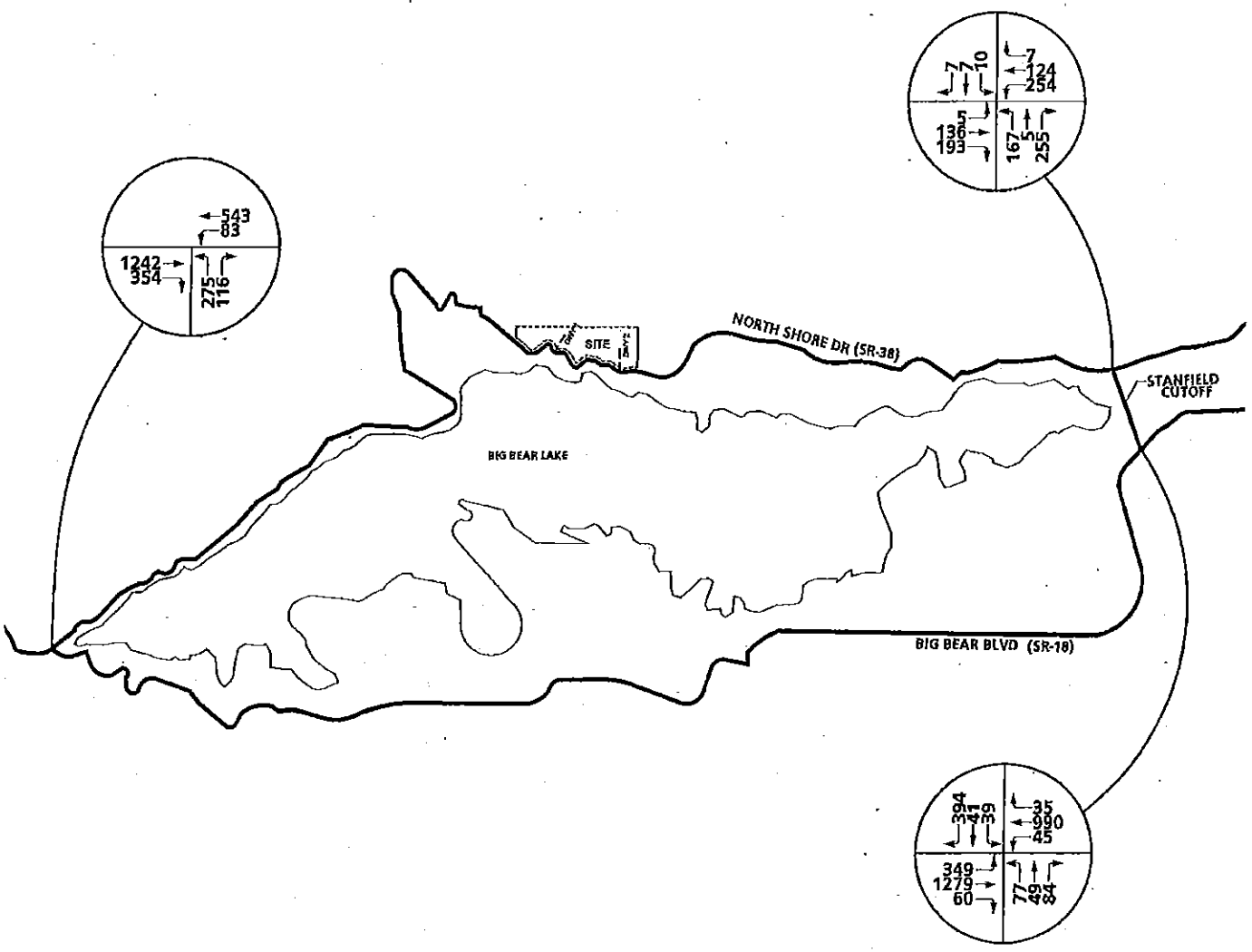


EXHIBIT 5-B

2010 WITHOUT PROJECT SUNDAY MID-DAY PEAK HOUR INTERSECTION VOLUMES



5.1.2 2010 With Project Conditions

The intersection operations analysis for 2010 With Project traffic conditions are summarized in Table 5-2, based on the geometrics analysis at the study area intersections, without and with improvements. 2010 With Project Friday PM and Sunday Mid-day peak hour intersection turning movement volumes are shown on Exhibits 5-C and 5-D, respectively. As shown in Table 5-2, the following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday Mid-day peak hours:

Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

The operations analysis worksheets for 2010 With Project conditions are included in Appendix "F".

5.2 General Plan Buildout With Project (2030) Traffic Operations

The intersection operations analysis for General Plan Buildout With Project (2030) traffic conditions are summarized in Table 5-3, based on the geometrics analysis at the study area intersections, without and with improvements. General Plan Buildout With Project (2030) Friday PM and Sunday Mid-day peak hour intersection turning movement volumes are shown on Exhibits 5-E and 5-F, respectively. The General Plan Buildout post-processed volumes worksheets are provided in Appendix "G". As shown in Table 5-3, the following study area intersections are currently operating at an unacceptable level of service during both Friday PM and Sunday Mid-day peak hours:

TABLE 5-2

INTERSECTION ANALYSIS FOR 2010 WITH PROJECT CONDITIONS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	Fri. PM	Sun. MD	Fri. PM	Sun. MD
North Shore Dr. (SR-38) (NS) at:																	
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	CSS	0	1	0	0	0	0	0	1	1	1	1	0	--[4]	--[4]	F	F
- With Improvements	TS	1	0	1	0	0	0	0	2	1	1	1	0	14.0	22.1	B	C
Stanfield Cutoff (NS) at:																	
• North Shore Dr. (SR-38) (EW)																	
- Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	--[4]	--[4]	F	F
- With Improvements	TS	1	1	0	1	1	0	1	1	0	1	1	0	32.4	31.5	C	C
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	TS	0	1	1	0	1	1	1	1	1	1	1	1	--[4]	--[4]	F	F
- With Improvements	TS	1	1	0	1	1	0	1	2	0	1	2	0	32.5	27.6	C	C
Driveway # 1 (NS) at:																	
• North Shore Dr. (SR-38) (EW)	CSS	0	0	0	0	1	0	0	1	0	0	1	0	11.1	12.0	B	B
Driveway # 2 (NS) at:																	
• North Shore Dr. (SR-38) (EW)	CSS	0	0	0	0	1	0	0	1	0	0	1	0	11.2	12.1	B	B

---

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1 = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.8 R3 (2006). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross Street Stop
AWS = All Way Stop

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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EXHIBIT 5-C

2010 WITH PROJECT FRIDAY PM PEAK INTERSECTION VOLUMES

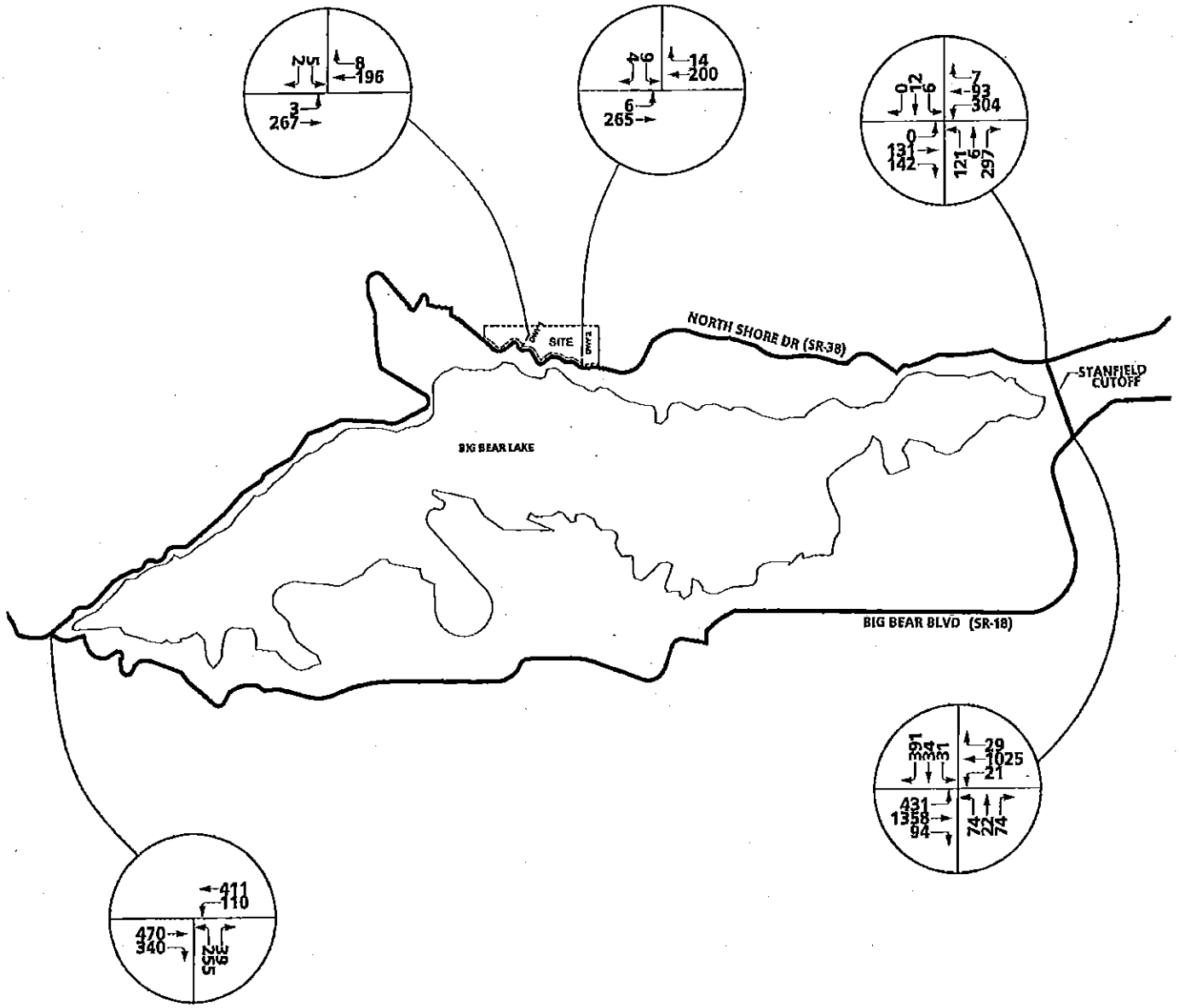

EXHIBIT 5-D

2010 WITH PROJECT SUNDAY MIDDAY PEAK INTERSECTION VOLUMES

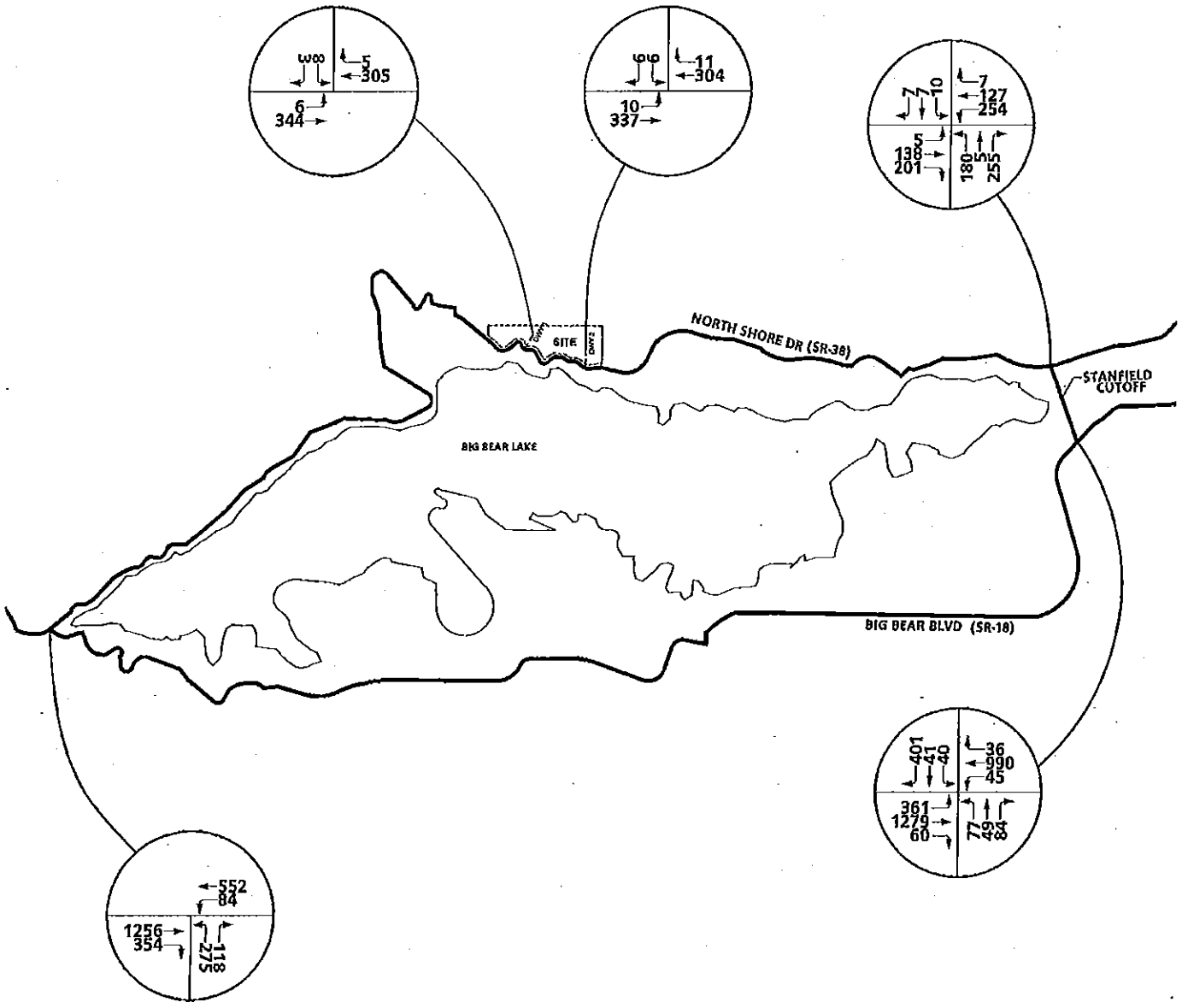

TABLE 5-3

INTERSECTION ANALYSIS FOR GENERAL PLAN BUILDOUT (2030) CONDITIONS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1] NORTH-BOUND L	T	R	SOUTH-BOUND L	T	R	EAST-BOUND L	T	R	WEST-BOUND L	T	R	DELAY[2] (SECS.) Fri. PM	Sun. MD	LEVEL OF SERVICE Fri. PM	Sun. MD
North Shore Dr. (SR-38) (NS) at:																	
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	CSS	0	1	0	0	0	0	0	1	1	1	1	0	--[4]	--[4]	F	F
- With Improvements	TS	1	0	1	0	0	0	0	2	1>	1	1	0	20.4	18.6	C	B
Stanfield Cutoff (NS) at:																	
• North Shore Dr. (SR-38) (EW)																	
- Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	--[4]	--[4]	F	F
- With Improvements	TS	2	1	0	1	1	0	1	1	1>	1	1	0	34.2	26.0	C	C
• Big Bear Blvd. (SR-18) (EW)																	
- Without Improvements	TS	0	1	1	0	1	1	1	1	1	1	1	1	--[4]	--[4]	F	F
- With Improvements	TS	1	1	0	1	1	1>	1	2	0	1	2	1	31.7	21.5	C	C
Driveway # 1 (NS) at:																	
• North Shore Dr. (SR-38) (EW)																	
- Without Improvements	CSS	0	0	0	0	1	0	0	1	0	0	1	0	49.6	24.2	E	C
- With Improvements	CSS	0	0	0	0	1	0	1	2	0	0	1	0	23.1	15.7	C	C
Driveway # 2 (NS) at:																	
• North Shore Dr. (SR-38) (EW)																	
- Without Improvements	CSS	0	0	0	0	1	0	0	1	0	0	1	0	41.9	18.8	E	C
- With Improvements	CSS	0	0	0	0	1	0	1	2	0	0	1	0	23.8	15.7	C	C

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1 = Improvement; > = Right Turn Overlap Phase

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.7 R5 (2005). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross Street Stop
AWS = All Way Stop

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

[5] Volume to Capacity ratio is greater than 1.00 = Level of Service "F".

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EXHIBIT 5-E

GENERAL PLAN BUILDOUT WITH PROJECT FRIDAY PM PEAK HOUR INTERSECTION VOLUMES

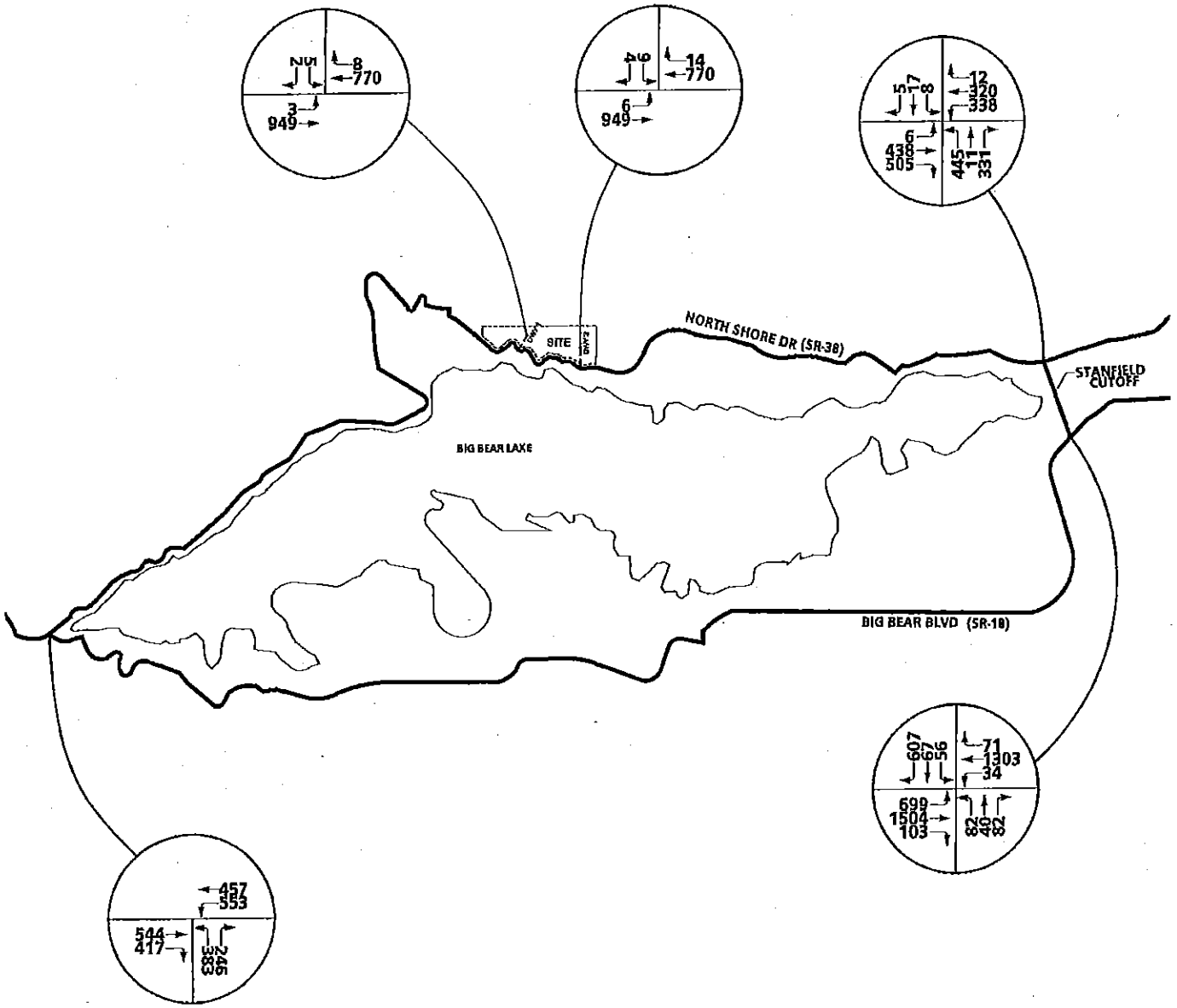
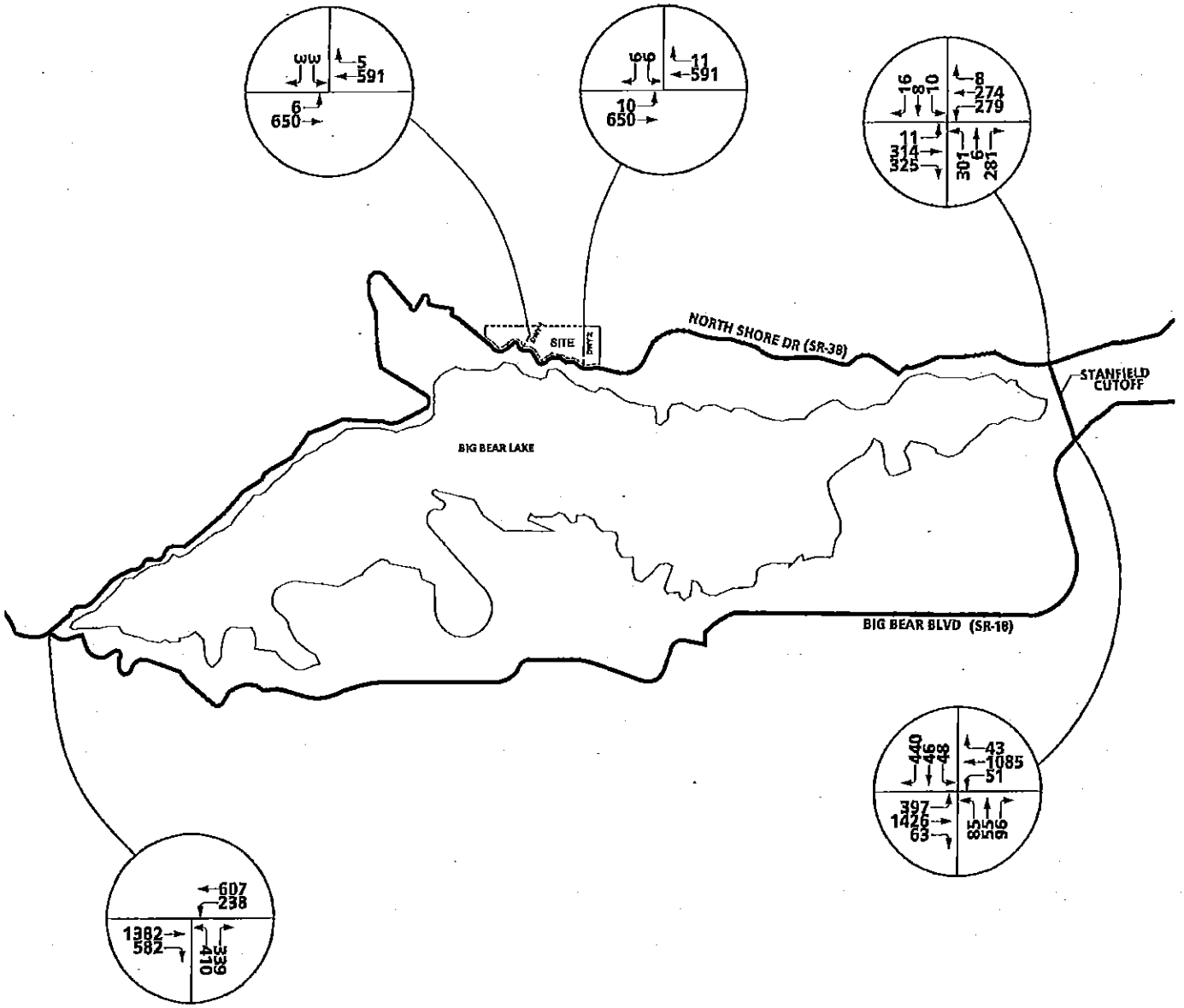


EXHIBIT 5-F

GENERAL PLAN BUILDOUT WITH PROJECT SUNDAY MIDDAY PEAK HOUR INTERSECTION VOLUMES



Big Bear Blvd (SR-18) (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- North Shore Drive (SR-38) (EW)

Stanfield Cut Off (NS) at:

- Big Bear Blvd (SR-18) (EW)

Driveway #1 (NS) at:

- North Shore Drive (SR-38) (EW)

Driveway #2 (NS) at:

- North Shore Drive (SR-38) (EW)

The operations analysis worksheets for General Plan Buildout With Project (2030) traffic conditions are included in Appendix "H".

6.0 SUMMARY AND RECOMMENDATIONS

This chapter summarizes the findings of this traffic impact analysis, and provides a series of recommendations related to project implementation.

6.1 Summary

The traffic issues related to the proposed land use and development have been evaluated in the context of the California Environmental Quality Act (CEQA) and the San Bernardino County Congestion Management Program (CMP). In conformance with the requirements of the San Bernardino County Congestion Management Program (CMP), the proposed project does not require a CMP traffic study. The CMP requires no analysis for projects that generate less than 250 peak hour trips. The project generates approximately 51 and 51 trips during the AM and PM peak hours, respectively; which is less than the required threshold for a CMP traffic study. However, a long-range traffic analysis has been required by County staff.

Project traffic volumes for all future conditions were estimated using a manual approach. The trip generation calculation is based on the most recent Institute of Transportation Engineers Trip Generation Rates, 7th Edition. The project trip distributions are derived from a select zone run of the San Bernardino Mountain Model.

Long Range General Plan Buildout (2030) conditions have been estimated based on the San Bernardino Mountain Model and the addition of both the project related peak hour volumes and the known cumulative development peak hour volumes per discussions with County staff.

6.1.1 The Project

The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and three lots for open space and common area on approximately 62.43 acres. Exhibit 1-B illustrates the project site plan.

The traffic related to the project has been calculated in accordance with the following accepted procedural steps:

- Trip Generation
- Trip Distribution
- Traffic Assignment

Table 2-2 (previously presented) summarizes the projected trip generation for the proposed development. As indicated in Table 2-2, the proposed Moon Camp residential development is projected to generate 479 trip-ends per day with 51 vehicles per hour during the weekday PM peak hour.

6.1.2 Existing Study Area Conditions

Regional access to the site is provided via North Shore Boulevard.

6.1.3 Future Conditions

An Interim Year (2010) analysis and long-range General Plan Buildout (2030) analysis are included in this report. Interim Year (2010) traffic operations analysis has been completed for the Friday PM and Sunday Mid-day peak hours and are shown in Tables 5-1 and 5-2 (previously presented). Friday PM peak hour and Sunday Mid-day peak hour traffic operations analysis are summarized in Tables 5-3 (previously presented)

for General Plan Buildout With Project (2030) conditions. All study intersections are projected to experience Level of Service "C" or better operations during the peak hours for all scenario analyzed.

6.2 Recommendations

The recommendations in this section address all necessary on-site improvements and off-site transportation improvements.

6.2.1 On-Site Improvements

On-site improvements and improvements adjacent to the site will be required in conjunction with the proposed development to ensure adequate circulation within the project itself. Exhibit 6-A illustrates the recommended improvement measures to address on-site circulation requirements of the proposed site, which include the following:

- Sight distance at the project access roadway should be reviewed with respect to Caltrans / County of San Bernardino sight distance standards at the time of final grading landscape and street improvement plans.

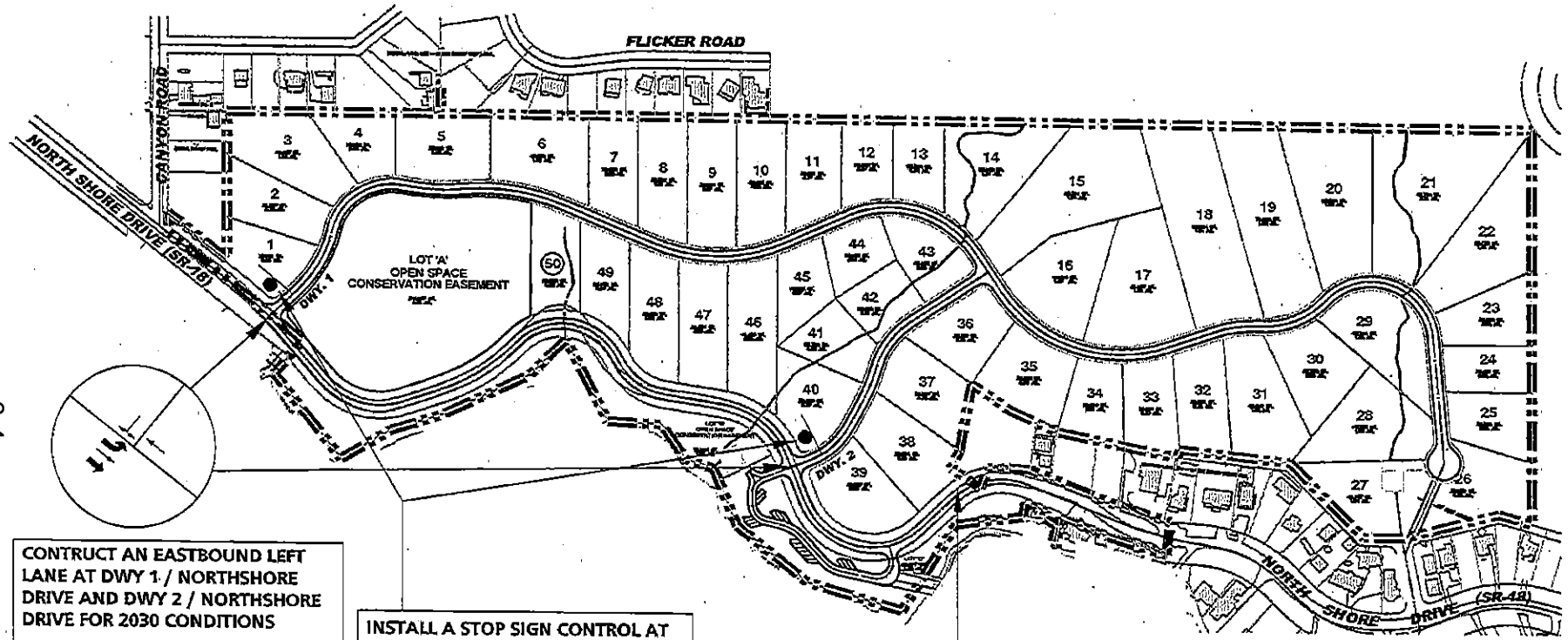
- Traffic signing / striping should be implemented in conjunction with detailed construction plans for the project site.

- Construct North Shore Drive at its ultimate half-section width as a Mountain Major highway from Canyon Drive to the Easterly project boundary.

- Install a stop sign control at Driveway #1 and Driveway #2

EXHIBIT 6-A

CIRCULATION RECOMMENDATIONS



CONTRUCT AN EASTBOUND LEFT LANE AT DWY 1 / NORTHSHORE DRIVE AND DWY 2 / NORTHSHORE DRIVE FOR 2030 CONDITIONS

INSTALL A STOP SIGN CONTROL AT THE DRIVEWAY 1 AND DRIVEWAY 2.

CONTRUCT A SECOND EASTBOUND THROUGH LANE AT DWY 1 / NORTHSHORE DRIVE AND DWY 2 / NORTHSHORE DRIVE FOR 2030 CONDITIONS

TRAFFIC SIGNING AND STRIPING SHOULD BE IMPLEMENTED IN CONJUNCTION WITH DETAILED CONSTRUCTION PLANS FOR THE PROJECT SITE.

SIGHT DISTANCE AT EACH PROJECT ACCESS ROADWAY SHOULD BE REVIEWED WITH RESPECT TO STANDARD CALTRANS AND COUNTY OF SAN BERNARDINO SIGHT DISTANCE STANDARDS AT THE TIME OF FINAL GRADING, LANDSCAPE AND STREET IMPROVEMENT PLANS.

CONSTRUCT NORTH SHORE DRIVE AT ITS ULTIMATE HALF-SECTION AS A MOUNTAIN MAJOR HIGHWAY FROM CANYON ROAD TO THE EASTERLY PROJECT BOUNDARY.

LEGEND:

● = STOP SIGN

➡ = RECOMMENDED IMPROVEMENT

N

URBAN

- Construct an Eastbound Left Turn Lane at Driveway 1 / North Shore Drive and Driveway 2/ North Shore Drive for 2030 Buildout Conditions

- Construct a 2nd Eastbound Through Lane at Driveway 1 / North Shore Drive and Driveway 2/ North Shore Drive for 2030 Buildout Conditions

6.2.2 Off-Site Improvements

The necessary off-site improvement recommendations were described in previous sections of this report. Exhibit 6-B illustrates the recommended improvements for 2010 Without Project and With Project traffic conditions. There are no additional recommended improvements for 2010 With Project traffic conditions compared to 2010 Without Project traffic conditions. Exhibit 6-C illustrates the recommended improvements for General Plan Buildout (2030) traffic conditions compared to the improvements shown on Exhibit 6-B.

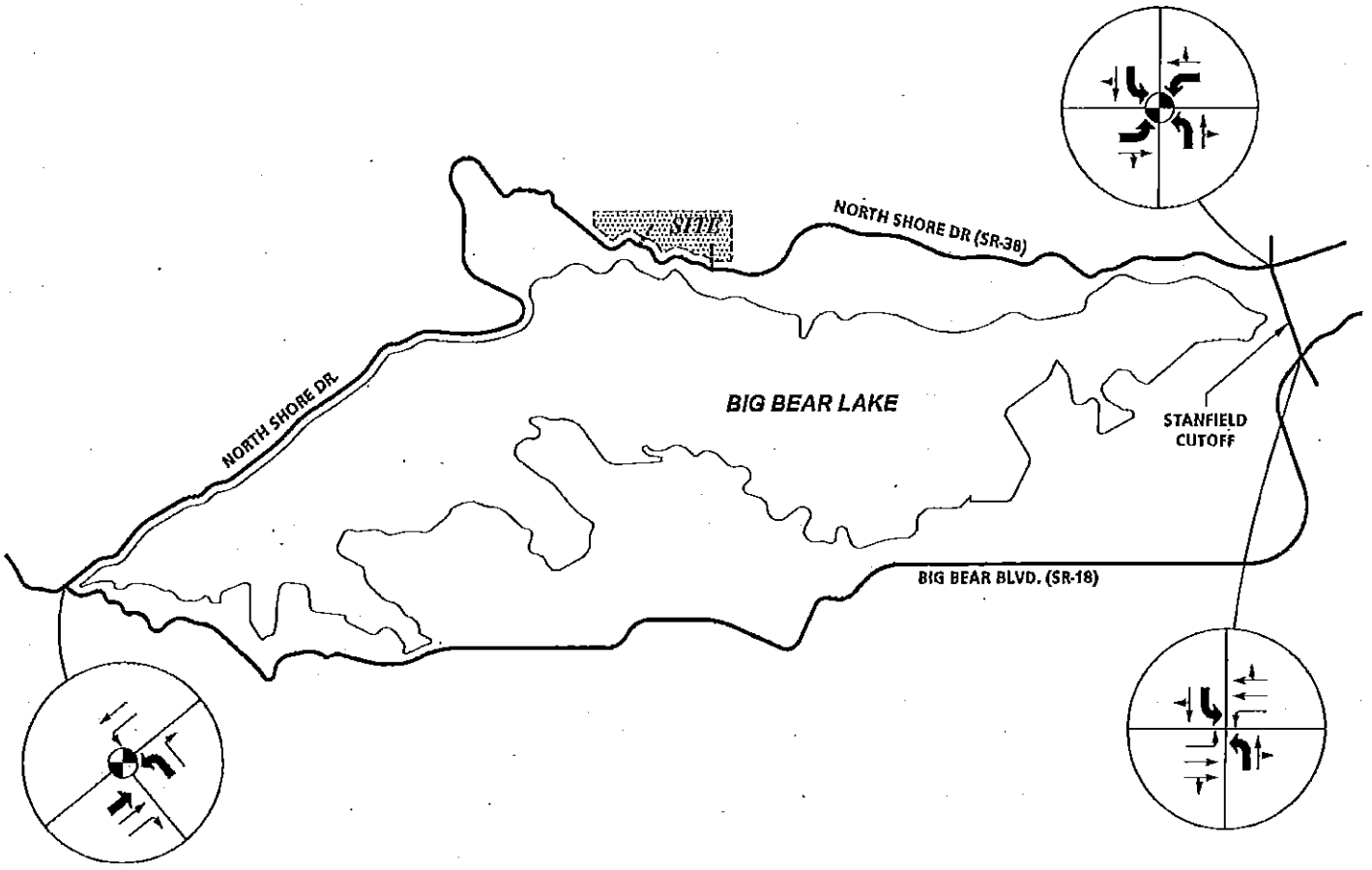
6.2.3 Project Fair Share Analysis

This section of the report summarizes the improvements and associated costs required to meet San Bernardino Congestion Management Program (CMP) level of service requirements for long range traffic condition, per discussion with County staff.

Table 6-1 indicates the needed long range 2030 improvements and resulting costs for the study area intersections. The cost data is provided in Appendix "G" of the San Bernardino Congestion Management Program, 2003 update (see Appendix "I"). Estimated cost (per SANBAG CMP table)

EXHIBIT 6-B

RECOMMENDED IMPROVEMENTS FOR 2010 WITHOUT AND WITH PROJECT CONDITIONS



LEGEND:

= TRAFFIC SIGNAL
= EXISTING LANE
= CURRENT PHASE IMPROVEMENTS

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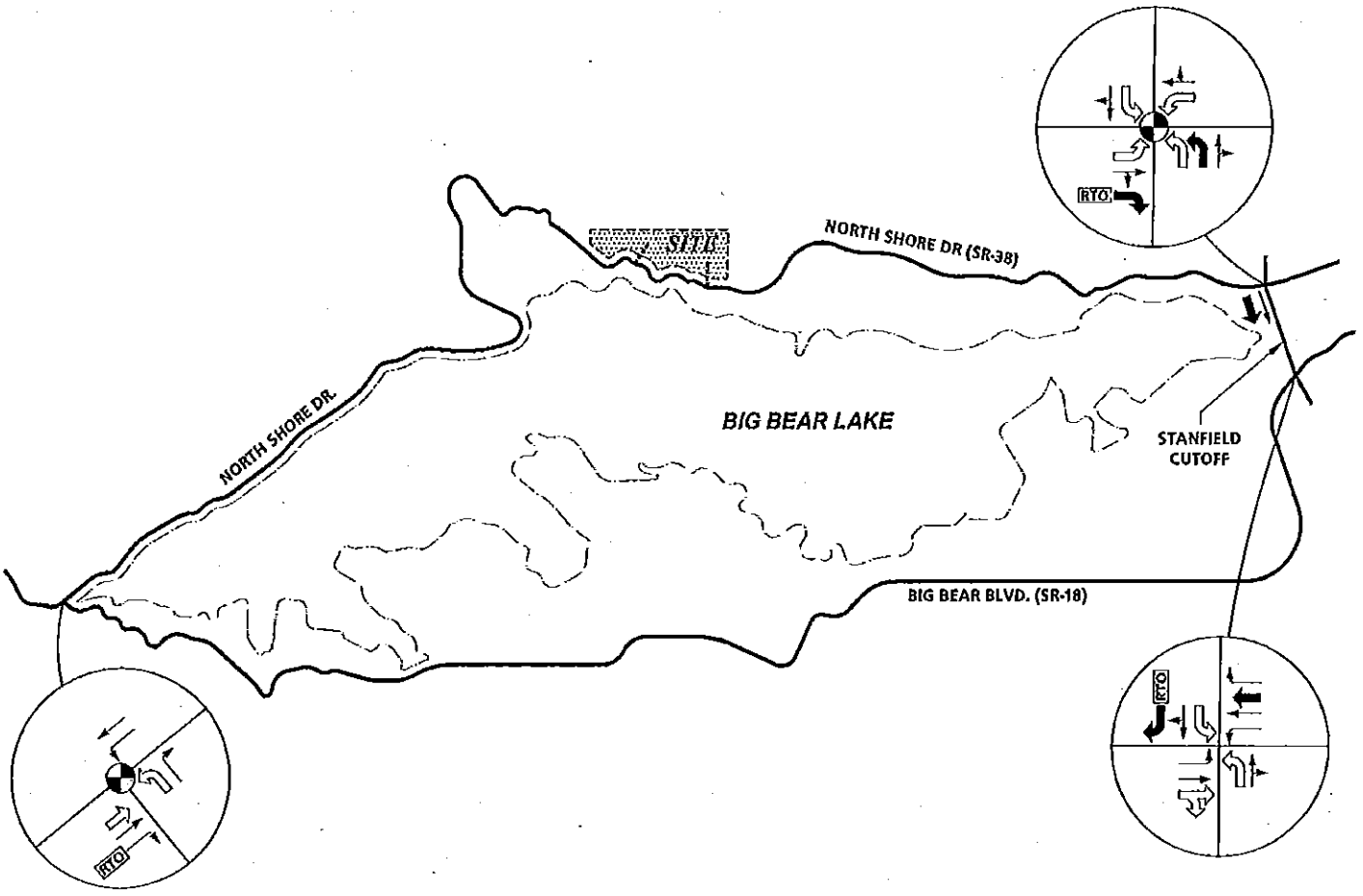
EXHIBIT 6-C

ADDITIONAL RECOMMENDED IMPROVEMENTS FOR GENERAL PLAN BUILDOUT (2030) CONDITIONS



LEGEND:

- = TRAFFIC SIGNAL
- = EXISTING LANE
- = CURRENT PHASE IMPROVEMENTS
- = PREVIOUS PHASE IMPROVEMENTS
- RTO = RIGHT TURN OVERLAP PHASING IMPROVEMENTS

N

MOON CAMP TIA, San Bernardino County, California - 04409: 04A (REVISED)

URBAN CROSSROADS

TABLE 6-1

ROADWAY IMPROVEMENTS COST

INTERSECTION	2030 IMPROVEMENTS	COST
North Shore Dr. (SR-38) (NS) at:	Install Traffic Signal	$400,000
• Big Bear Blvd. (SR-18) (EW)	Construct NB Left Turn Lane	$50,000
	Construct EB Through Lane	$289,720
	Add Right Turn Overlap Phasing	$25,000
		$764,720
Standfield Cutoff (NS) at:		
• North Shore Dr. (EW)	Install Traffic Signal	$400,000
	Construct 2 NB left turn lanes	$100,000
	Construct SB left turn lane	$50,000
	Construct EB left turn lane	$50,000
	Construct EB right turn lane	$50,000
	Add Right Turn Overlap Phasing	$25,000
	Construct WB left turn lane	$50,000
		$725,000
Stanfield Cutoff (NS) at:		
• Big Bear Blvd. (EW)	Construct NB left turn lane	$50,000
	Construct SB left turn lane	$50,000
	Construct SB right turn lane	$50,000
	Add Right Turn Overlap Phasing	$25,000
	Construct EB through lane	$289,720
	Construct WB through lane	$289,720
	Signal Modification	$40,000
		$794,440
TOTAL - COST OF CONSTRUCTION		**$2,284,160**

Source: Appendix "G" of the San Bernardino Congestion Management Program, 2003 update.

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for a through lane is $289,720 (600 feet long for upstream and 600 feet long including taper for downstream). As indicated in Table 6-1, the total cost of needed intersection improvements is $2,284,160.

The project fair share contribution towards the required improvements has also been calculated. Table 6-2 includes the project's cost contribution based on the project's percent of new traffic. As indicated in Table 6-2, the highest Friday PM or Sunday Mid-day fair share cost is approximately $48,921.

6.2.4 Transportation System Management Actions

a. Off-Site

As development in the area occurs, transit agencies should consider expanding service within the area.

b. On-Site

The on-site design should accommodate private and/or public bus access design and parking as necessary.

TABLE 6-2

PROJECT FAIR SHARE

SEGMENT	COST	PEAK HOUR	EXISTING TRAFFIC	2030 WITH PROJECT TRAFFIC	PROJECT TRAFFIC	TOTAL NEW TRAFFIC	PROJECT % OF NEW TRAFFIC	(A) FRIDAY PM PROJECT COST SHARE	(B) SUNDAY MID. PROJECT COST SHARE	HIGHEST FRIDAY PM OR SUNDAY MID. COST SHARE
North Shore Dr. (SR-38) (NS) at:										
• Big Bear Blvd. (EW)	$764,720									
		Friday PM	906	2,600	16	1,694	0.94%	$7,223	$14,728	$14,728
		Sunday Midday	2208	3,558	26	1,350	1.93%			
Standfield Cutoff (NS) at:										
• North Shore Dr. (EW)	$725,000									
		Friday PM	822	2,436	36	1,614	2.23%	$16,171	$20,291	$20,291
		Sunday Midday	904	1,833	26	929	2.80%			
Stanfield Cutoff (NS) at:										
• Big Bear Blvd. (EW)	$794,440									
		Friday PM	2,745	4,648	29	1,903	1.52%	$12,107	$13,903	$13,903
		Sunday Midday	2,635	3,835	21	1,200	1.75%			
GRAND TOTAL - COST SHARE FOR IMPROVEMENTS								**$35,500**	**$48,921**	**$48,921**

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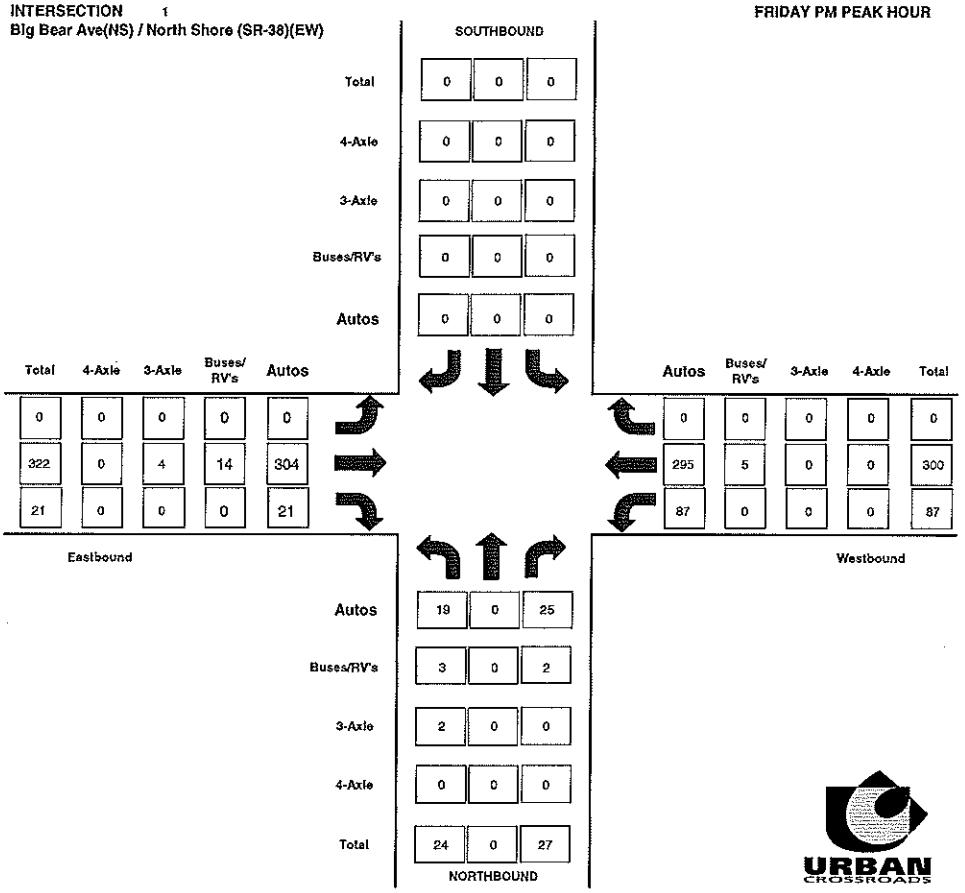
APPENDIX A

TRAFFIC COUNT DATA

PASSENGER CAR EQUIVALENCY PEAK HOUR COUNT SUMMARY

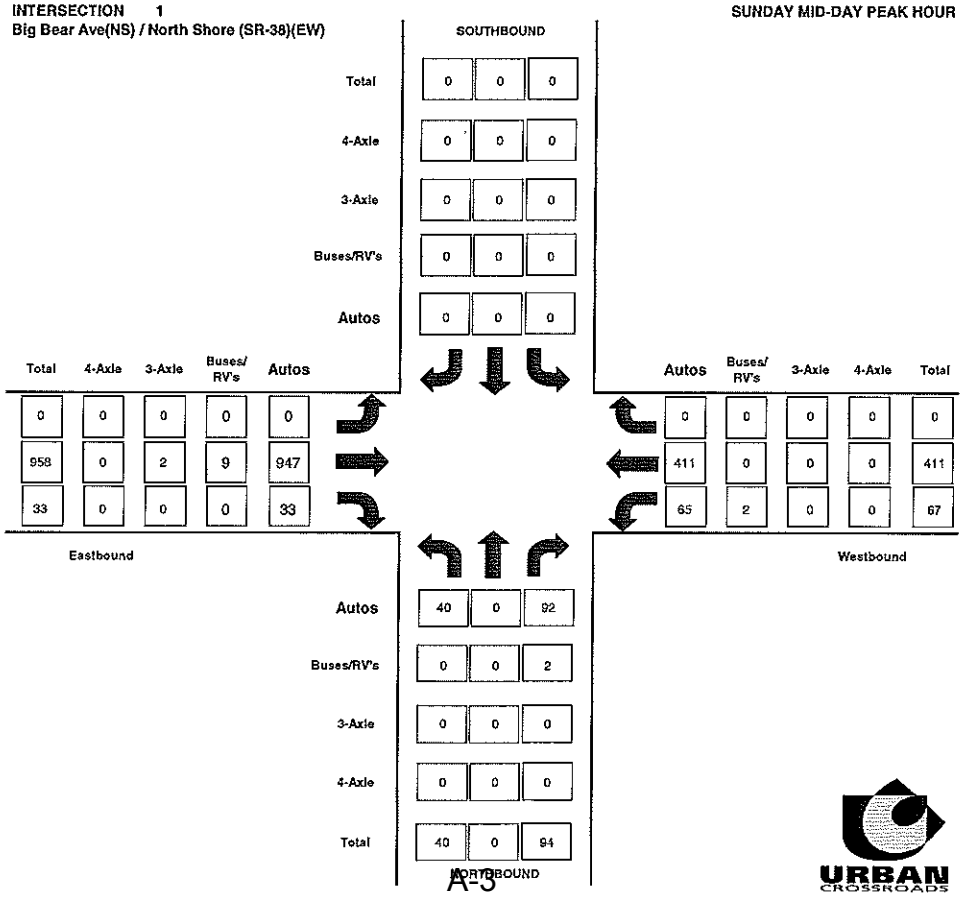
INTERSECTION 1
Big Bear Ave(NS) / North Shore (SR-38)(EW)

FRIDAY PM PEAK HOUR



INTERSECTION 1
Big Bear Ave(NS) / North Shore (SR-38)(EW)

SUNDAY MID-DAY PEAK HOUR



City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Dr

File Name : Not Named 1
Site Code : 1
Start Date : 3/2/2007
Page No : 1

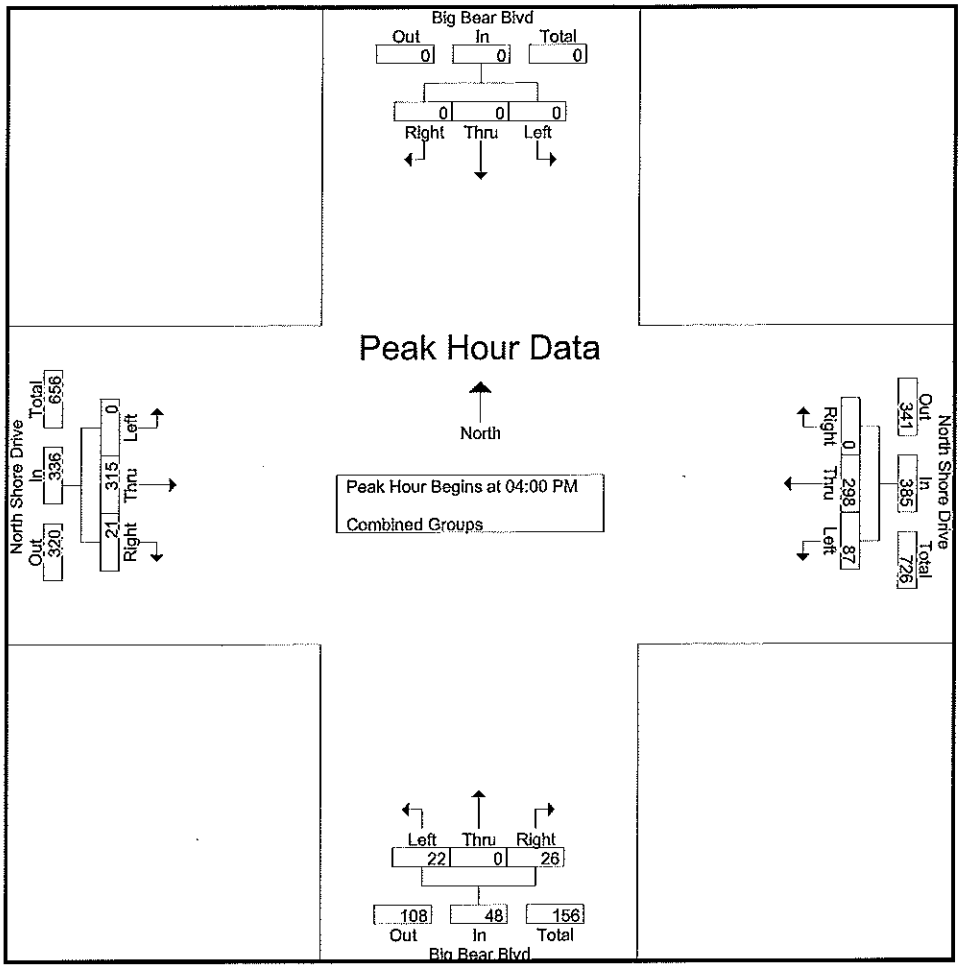
Groups Printed- Combined Groups

	Big Bear Blvd Southbound				North Shore Drive Westbound				Big Bear Blvd Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	17	87	0	104	3	0	9	12	0	80	5	85	201
04:15 PM	0	0	0	0	20	92	0	112	9	0	6	15	0	96	7	103	230
04:30 PM	0	0	0	0	20	66	0	86	6	0	6	12	0	88	7	95	193
04:45 PM	0	0	0	0	30	53	0	83	4	0	5	9	0	51	2	53	145
Total	0	0	0	0	87	298	0	385	22	0	26	48	0	315	21	336	769
05:00 PM	0	0	0	0	30	70	0	100	5	0	4	9	0	71	5	76	185
05:15 PM	0	0	0	0	17	74	0	91	2	0	5	7	0	79	6	85	183
05:30 PM	0	0	0	0	20	53	0	73	2	0	3	5	0	77	6	83	161
05:45 PM	0	0	0	0	8	43	0	51	1	0	2	3	0	45	0	45	99
Total	0	0	0	0	75	240	0	315	10	0	14	24	0	272	17	289	628
Grand Total	0	0	0	0	162	538	0	700	32	0	40	72	0	587	38	625	1397
Apprch %	0	0	0		23.1	76.9	0		44.4	0	55.6		0	93.9	6.1		
Total %	0	0	0	0	11.6	38.5	0	50.1	2.3	0	2.9	5.2	0	42	2.7	44.7	

	Big Bear Blvd Southbound				North Shore Drive Westbound				Big Bear Blvd Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	17	87	0	104	3	0	**9**	12	0	80	5	85	201
04:15 PM	0	0	0	0	20	**92**	0	**112**	**9**	0	6	**15**	0	**96**	**7**	**103**	**230**
04:30 PM	0	0	0	0	20	66	0	86	6	0	6	12	0	88	7	95	193
04:45 PM	0	0	0	0	**30**	53	0	83	4	0	5	9	0	51	2	53	145
Total Volume	0	0	0	0	87	298	0	385	22	0	26	48	0	315	21	336	769
% App. Total	0	0	0		22.6	77.4	0		45.8	0	54.2		0	93.8	6.2		
PHF	.000	.000	.000	.000	.725	.810	.000	.859	.611	.000	.722	.800	.000	.820	.750	.816	.836

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Dr

File Name : Not Named 1
Site Code : 1
Start Date : 3/2/2007
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	17	87	0	104	3	0	**9**	12	0	80	5	85
+15 mins.	0	0	0	0	20	**92**	0	**112**	**9**	0	6	**15**	0	**96**	**7**	**103**
+30 mins.	0	0	0	0	20	66	0	86	6	0	6	12	0	88	7	95
+45 mins.	0	0	0	0	**30**	53	0	83	4	0	5	9	0	51	2	53
Total Volume	0	0	0	0	87	298	0	385	22	0	26	48	0	315	21	336
% App. Total	0	0	0		22.6	77.4	0		45.8	0	54.2		0	93.8	6.2	
PHF	.000	.000	.000	.000	.725	.810	.000	.859	.611	.000	.722	.800	.000	.820	.750	.816

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Dr

File Name : NShoreDr(SR-18) Friday
Site Code : 1
Start Date : 3/2/2007
Page No : 1

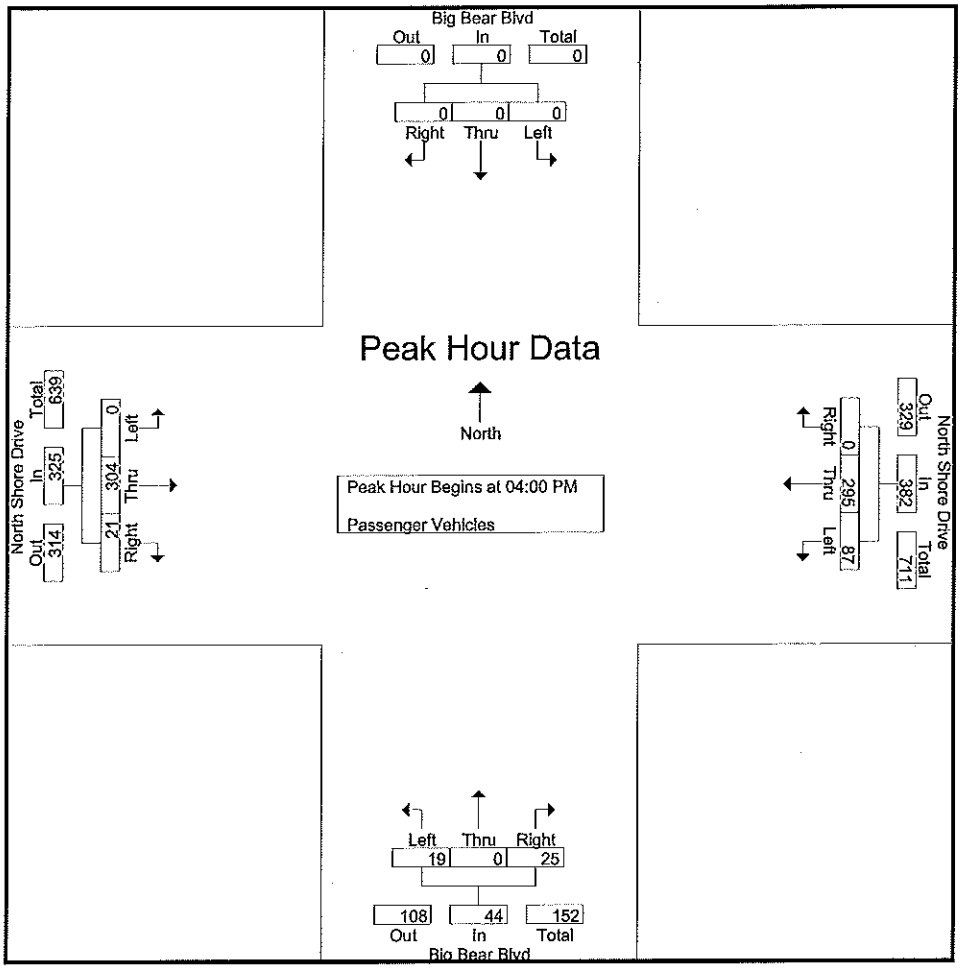
Groups Printed- Passenger Vehicles

	Big Bear Blvd Southbound				North Shore Drive Westbound				Big Bear Blvd Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	17	86	0	103	3	0	9	12	0	79	5	84	199
04:15 PM	0	0	0	0	20	91	0	111	7	0	5	12	0	90	7	97	220
04:30 PM	0	0	0	0	20	65	0	85	5	0	6	11	0	86	7	93	189
04:45 PM	0	0	0	0	30	53	0	83	4	0	5	9	0	49	2	51	143
Total	0	0	0	0	87	295	0	382	19	0	25	44	0	304	21	325	751
05:00 PM	0	0	0	0	30	69	0	99	3	0	4	7	0	69	5	74	180
05:15 PM	0	0	0	0	17	74	0	91	2	0	3	5	0	78	6	84	180
05:30 PM	0	0	0	0	20	53	0	73	2	0	3	5	0	75	6	81	159
05:45 PM	0	0	0	0	8	43	0	51	1	0	2	3	0	43	0	43	97
Total	0	0	0	0	75	239	0	314	8	0	12	20	0	265	17	282	616
Grand Total	0	0	0	0	162	534	0	696	27	0	37	64	0	569	38	607	1367
Apprch %	0	0	0		23.3	76.7	0		42.2	0	57.8		0	93.7	6.3		
Total %	0	0	0	0	11.9	39.1	0	50.9	2	0	2.7	4.7	0	41.6	2.8	44.4	

	Big Bear Blvd Southbound				North Shore Drive Westbound				Big Bear Blvd Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	17	86	0	103	3	0	**9**	**12**	0	79	5	84	199
04:15 PM	0	0	0	0	20	**91**	0	**111**	**7**	0	5	12	0	**90**	**7**	**97**	**220**
04:30 PM	0	0	0	0	20	65	0	85	5	0	6	11	0	86	7	93	189
04:45 PM	0	0	0	0	**30**	53	0	83	4	0	5	9	0	49	2	51	143
Total Volume	0	0	0	0	87	295	0	382	19	0	25	44	0	304	21	325	751
% App. Total	0	0	0		22.8	77.2	0		43.2	0	56.8		0	93.5	6.5		
PHF	.000	.000	.000	.000	.725	.810	.000	.860	.679	.000	.694	.917	.000	.844	.750	.838	.853

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Dr

File Name : NShoreDr(SR-18) Friday
Site Code : 1
Start Date : 3/2/2007
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	17	86	0	103	3	0	**9**	**12**	0	79	5	84
+15 mins.	0	0	0	0	20	**91**	0	**111**	**7**	0	5	12	0	**90**	**7**	**97**
+30 mins.	0	0	0	0	20	65	0	85	5	0	6	11	0	86	7	93
+45 mins.	0	0	0	0	**30**	53	0	83	4	0	5	9	0	49	2	51
Total Volume	0	0	0	0	87	295	0	382	19	0	25	44	0	304	21	325
% App. Total	0	0	0		22.8	77.2	0		43.2	0	56.8		0	93.5	6.5	
PHF	.000	.000	.000	.000	.725	.810	.000	.860	.679	.000	.694	.917	.000	.844	.750	.838

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Dr

Traffic Data Consultants

File Name : NShoreDr(SR-18) Friday
Site Code : 1
Start Date : 3/2/2007
Page No : 1

Groups Printed- Large 2 Axle

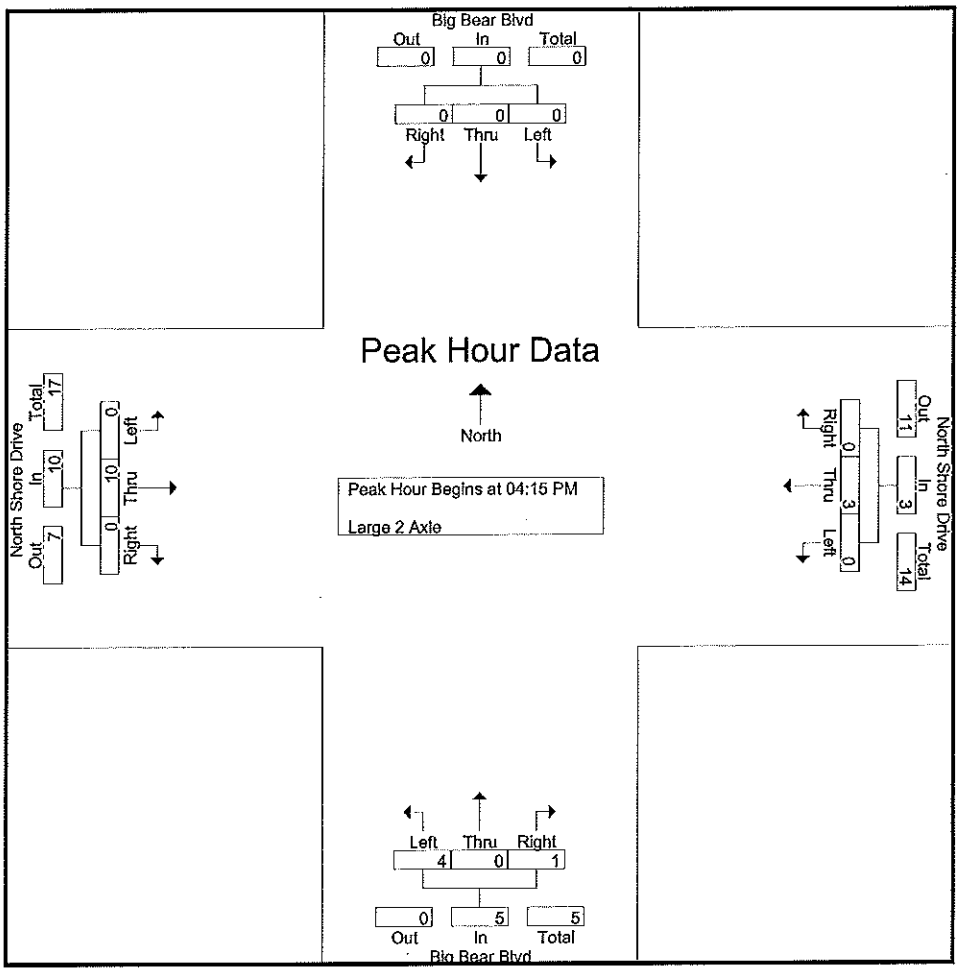
	Big Bear Blvd Southbound				North Shore Drive Westbound				Big Bear Blvd Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
04:15 PM	0	0	0	0	0	1	0	1	2	0	1	3	0	6	0	6	10
04:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	3	0	3	2	0	1	3	0	9	0	9	15
05:00 PM	0	0	0	0	0	1	0	1	2	0	0	2	0	2	0	2	5
05:15 PM	0	0	0	0	0	0	0	0	0	0	2	2	0	1	0	1	3
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	0	0	0	0	0	1	0	1	2	0	2	4	0	7	0	7	12
Grand Total	0	0	0	0	0	4	0	4	4	0	3	7	0	16	0	16	27
Apprch %	0	0	0		0	100	0		57.1	0	42.9		0	100	0		
Total %	0	0	0	0	0	14.8	0	14.8	14.8	0	11.1	25.9	0	59.3	0	59.3	

	Big Bear Blvd Southbound				North Shore Drive Westbound				Big Bear Blvd Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	1	0	1	**2**	0	**1**	**3**	0	**6**	0	**6**	**10**
04:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:00 PM	0	0	0	0	0	1	0	1	2	0	0	2	0	2	0	2	5
Total Volume	0	0	0	0	0	3	0	3	4	0	1	5	0	10	0	10	18
% App. Total	0	0	0		0	100	0		80	0	20		0	100	0		
PHF	.000	.000	.000	.000	.000	.750	.000	.750	.500	.000	.250	.417	.000	.417	.000	.417	.450

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Dr

Traffic Data Consultants

File Name : NShoreDr(SR-18) Friday
Site Code : 1
Start Date : 3/2/2007
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:15 PM				04:15 PM			
+0 mins.	0	0	0	0	0	1	0	1	2	0	1	3	0	6	0	6
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
+30 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	0	0	0	2	0	0	2	0	2	0	2
Total Volume	0	0	0	0	0	3	0	3	4	0	1	5	0	10	0	10
% App. Total	0	0	0		0	100	0		80	0	20		0	100	0	
PHF	.000	.000	.000	.000	.000	.750	.000	.750	.500	.000	.250	.417	.000	.417	.000	.417

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Dr

Traffic Data Consultants

File Name : NShoreDr(SR-18) Friday
Site Code : 1
Start Date : 3/2/2007
Page No : 1

Groups Printed- 3 Axle

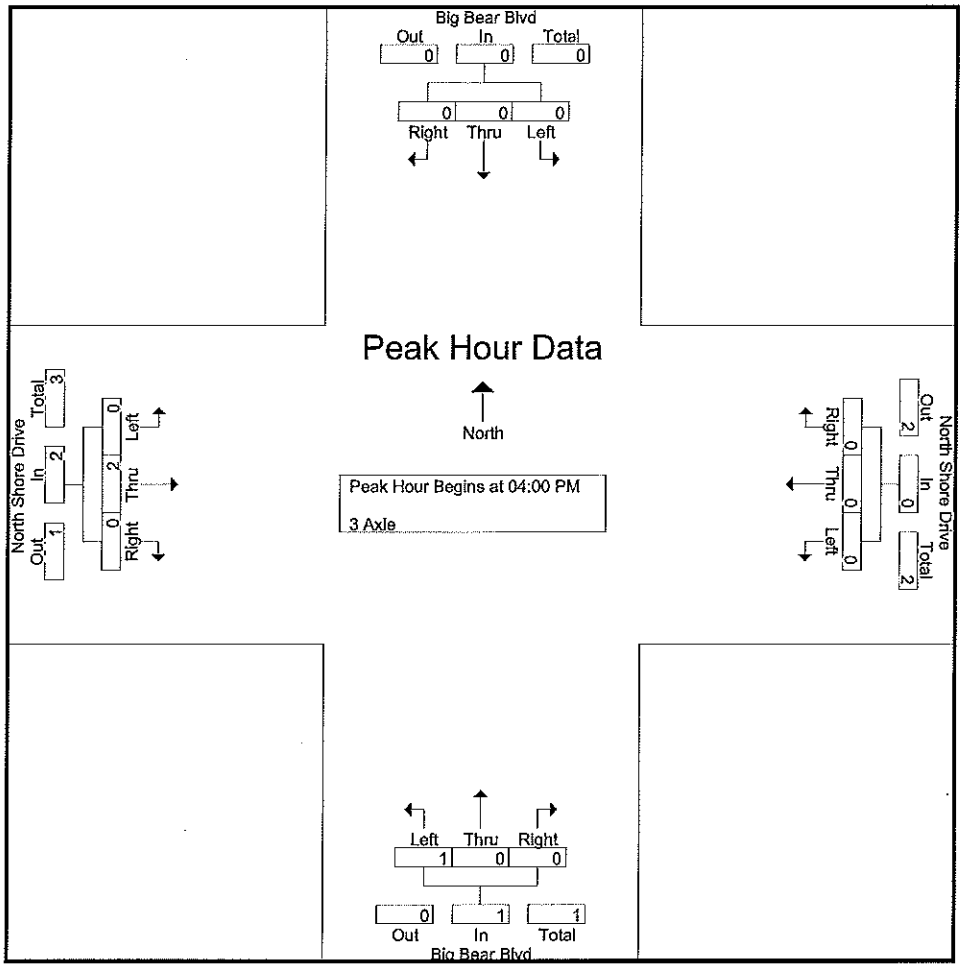
	Big Bear Blvd Southbound				North Shore Drive Westbound				Big Bear Blvd Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	2	3
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	2	3
Apprch %	0	0	0		0	0	0		100	0	0		0	100	0		
Total %	0	0	0	0	0	0	0	0	33.3	0	0	33.3	0	66.7	0	66.7	

	Big Bear Blvd Southbound				North Shore Drive Westbound				Big Bear Blvd Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	2	3
% App. Total	0	0	0		0	0	0		100	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.500	.000	.500	.375

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Dr

Traffic Data Consultants

File Name : NShoreDr(SR-18) Friday
Site Code : 1
Start Date : 3/2/2007
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	2
% App. Total	0	0	0		0	0	0		100	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.500	.000	.500

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Drive

File Name : NShoreDr&BigBearBlvd Comb Sun
Site Code : 1
Start Date : 3/4/2007
Page No : 1

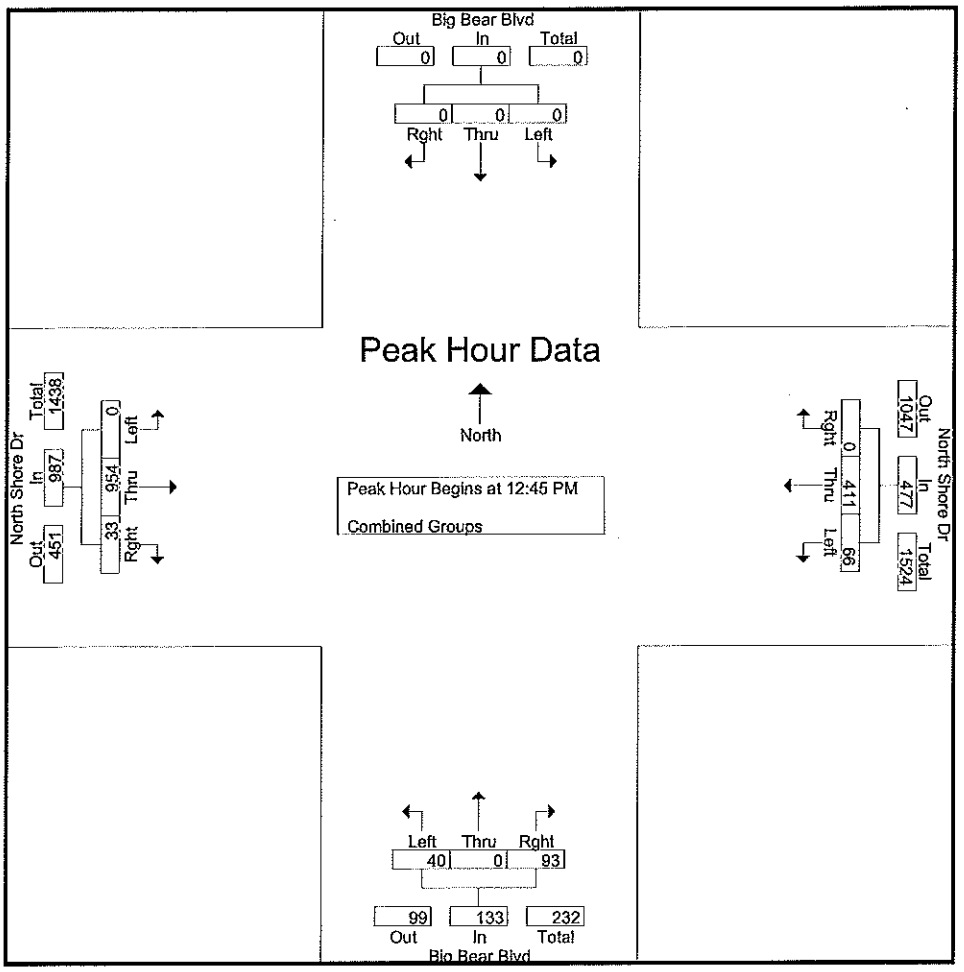
Groups Printed- Combined Groups

	Big Bear Blvd Southbound				North Shore Dr Westbound				Big Bear Blvd Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	0	0	0	0	21	115	0	136	11	0	25	36	0	174	11	185	357
12:15 PM	0	0	0	0	18	101	0	119	8	0	21	29	0	183	6	189	337
12:30 PM	0	0	0	0	18	104	0	122	4	0	24	28	0	183	12	195	345
12:45 PM	0	0	0	0	10	103	0	113	7	0	27	34	0	228	8	236	383
Total	0	0	0	0	67	423	0	490	30	0	97	127	0	768	37	805	1422
01:00 PM	0	0	0	0	11	104	0	115	14	0	27	41	0	237	8	245	401
01:15 PM	0	0	0	0	26	126	0	152	6	0	19	25	0	251	10	261	438
01:30 PM	0	0	0	0	19	78	0	97	13	0	20	33	0	238	7	245	375
01:45 PM	0	0	0	0	18	71	0	89	8	0	22	30	0	213	13	226	345
Total	0	0	0	0	74	379	0	453	41	0	88	129	0	939	38	977	1559
Grand Total	0	0	0	0	141	802	0	943	71	0	185	256	0	1707	75	1782	2981
Apprch %	0	0	0		15	85	0		27.7	0	72.3		0	95.8	4.2		
Total %	0	0	0	0	4.7	26.9	0	31.6	2.4	0	6.2	8.6	0	57.3	2.5	59.8	

	Big Bear Blvd Southbound				North Shore Dr Westbound				Big Bear Blvd Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:45 PM																	
12:45 PM	0	0	0	0	10	103	0	113	7	0	**27**	34	0	228	8	236	383
01:00 PM	0	0	0	0	11	104	0	115	**14**	0	27	**41**	0	237	8	245	401
01:15 PM	0	0	0	0	**26**	**126**	0	**152**	6	0	19	25	0	**251**	**10**	**261**	**438**
01:30 PM	0	0	0	0	19	78	0	97	13	0	20	33	0	238	7	245	375
Total Volume	0	0	0	0	66	411	0	477	40	0	93	133	0	954	33	987	1597
% App. Total	0	0	0		13.8	86.2	0		30.1	0	69.9		0	96.7	3.3		
PHF	.000	.000	.000	.000	.635	.815	.000	.785	.714	.000	.861	.811	.000	.950	.825	.945	.912

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Drive

File Name : NShoreDr&BigBearBlvd Comb Sun
Site Code : 1
Start Date : 3/4/2007
Page No : 2



Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	12:00 PM				12:30 PM				12:45 PM				12:45 PM			
+0 mins.	0	0	0	0	18	104	0	122	7	0	**27**	34	0	228	8	236
+15 mins.	0	0	0	0	10	103	0	113	**14**	0	27	**41**	0	237	8	245
+30 mins.	0	0	0	0	11	104	0	115	6	0	19	25	0	**251**	**10**	**261**
+45 mins.	0	0	0	0	**26**	**126**	0	**152**	13	0	20	33	0	238	7	245
Total Volume	0	0	0	0	65	437	0	502	40	0	93	133	0	954	33	987
% App. Total	0	0	0		12.9	87.1	0		30.1	0	69.9		0	96.7	3.3	
PHF	.000	.000	.000	.000	.625	.867	.000	.826	.714	.000	.861	.811	.000	.950	.825	.945

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Drive

File Name : NShoreDr(SR-18) Sunday
Site Code : 1
Start Date : 3/4/2007
Page No : 1

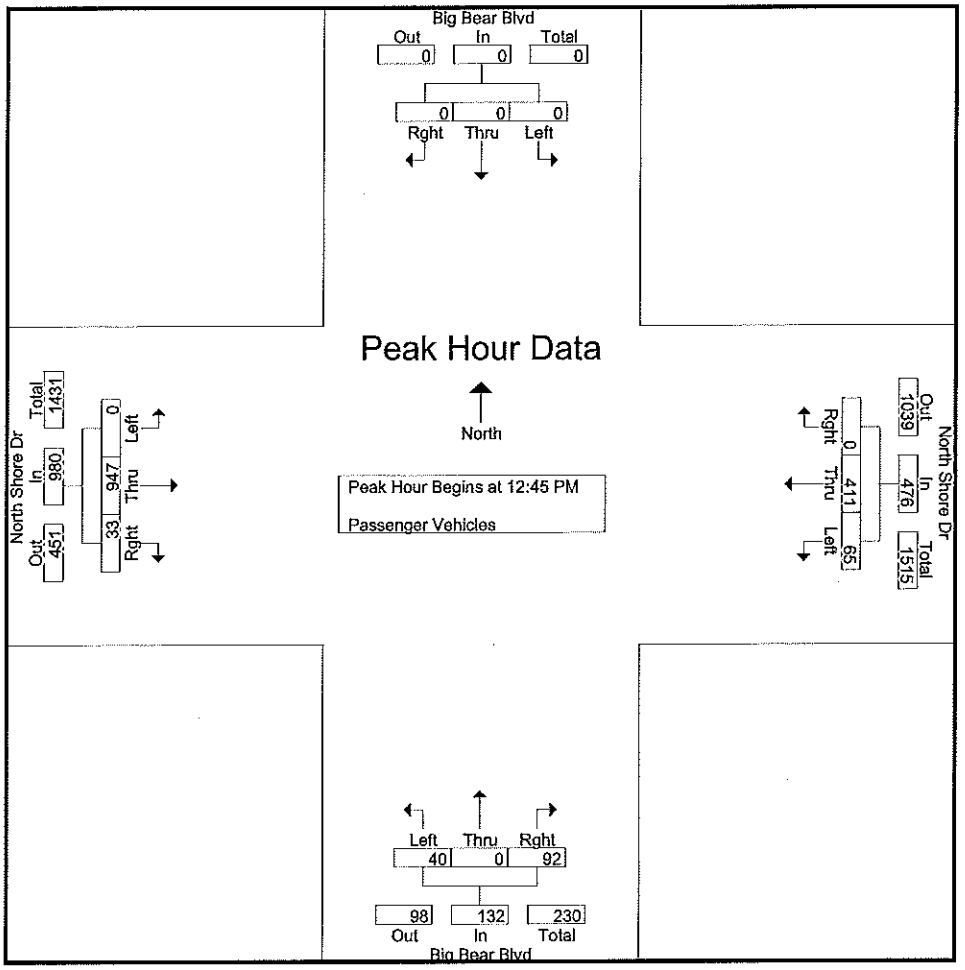
Groups Printed- Passenger Vehicles

	Big Bear Blvd Southbound				North Shore Dr Westbound				Big Bear Blvd Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	0	0	0	0	21	115	0	136	11	0	25	36	0	172	11	183	355
12:15 PM	0	0	0	0	18	97	0	115	8	0	21	29	0	183	5	188	332
12:30 PM	0	0	0	0	18	104	0	122	4	0	24	28	0	183	12	195	345
12:45 PM	0	0	0	0	10	103	0	113	7	0	27	34	0	226	8	234	381
Total	0	0	0	0	67	419	0	486	30	0	97	127	0	764	36	800	1413
01:00 PM	0	0	0	0	11	104	0	115	14	0	26	40	0	236	8	244	399
01:15 PM	0	0	0	0	26	126	0	152	6	0	19	25	0	248	10	258	435
01:30 PM	0	0	0	0	18	78	0	96	13	0	20	33	0	237	7	244	373
01:45 PM	0	0	0	0	17	70	0	87	7	0	21	28	0	211	13	224	339
Total	0	0	0	0	72	378	0	450	40	0	86	126	0	932	38	970	1546
Grand Total	0	0	0	0	139	797	0	936	70	0	183	253	0	1696	74	1770	2959
Apprch %	0	0	0		14.9	85.1	0		27.7	0	72.3		0	95.8	4.2		
Total %	0	0	0	0	4.7	26.9	0	31.6	2.4	0	6.2	8.6	0	57.3	2.5	59.8	

	Big Bear Blvd Southbound				North Shore Dr Westbound				Big Bear Blvd Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:45 PM																	
12:45 PM	0	0	0	0	10	103	0	113	7	0	**27**	34	0	226	8	234	381
01:00 PM	0	0	0	0	**11**	104	0	115	**14**	0	26	**40**	0	236	8	244	399
01:15 PM	0	0	0	0	**26**	**126**	0	**152**	6	0	19	25	0	**248**	**10**	**258**	**435**
01:30 PM	0	0	0	0	18	78	0	96	13	0	20	33	0	237	7	244	373
Total Volume	0	0	0	0	65	411	0	476	40	0	92	132	0	947	33	980	1588
% App. Total	0	0	0		13.7	86.3	0		30.3	0	69.7		0	96.6	3.4		
PHF	.000	.000	.000	.000	.625	.815	.000	.783	.714	.000	.852	.825	.000	.955	.825	.950	.913

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Drive

File Name : NShoreDr(SR-18) Sunday
Site Code : 1
Start Date : 3/4/2007
Page No : 2



Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	12:00 PM				12:30 PM				12:45 PM				12:45 PM			
+0 mins.	0	0	0	0	18	104	0	122	7	0	**27**	34	0	226	8	234
+15 mins.	0	0	0	0	10	103	0	113	**14**	0	26	**40**	0	236	8	244
+30 mins.	0	0	0	0	11	104	0	115	6	0	19	25	0	**248**	**10**	**258**
+45 mins.	0	0	0	0	**26**	**126**	0	**152**	13	0	20	33	0	237	7	244
Total Volume	0	0	0	0	65	437	0	502	40	0	92	132	0	947	33	980
% App. Total	0	0	0		12.9	87.1	0		30.3	0	69.7		0	96.6	3.4	
PHF	.000	.000	.000	.000	.625	.867	.000	.826	.714	.000	.852	.825	.000	.955	.825	.950

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Drive

File Name : NShoreDr(SR-18) Sunday
Site Code : 1
Start Date : 3/4/2007
Page No : 1

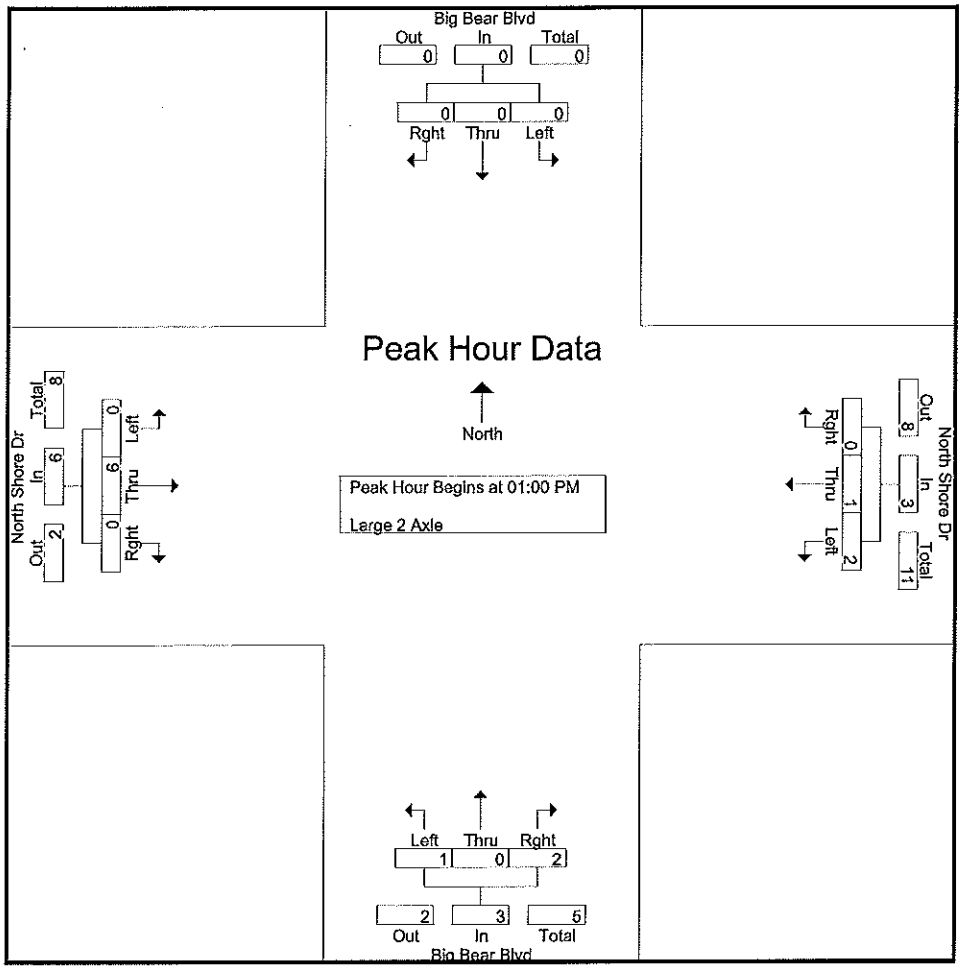
Groups Printed- Large 2 Axle

	Big Bear Blvd Southbound				North Shore Dr Westbound				Big Bear Blvd Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
12:15 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	1	1	4
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	0	0	0	0	0	3	0	3	0	0	0	0	0	4	1	5	8
01:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
01:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
01:45 PM	0	0	0	0	1	1	0	2	1	0	1	2	0	2	0	2	6
Total	0	0	0	0	2	1	0	3	1	0	2	3	0	6	0	6	12
Grand Total	0	0	0	0	2	4	0	6	1	0	2	3	0	10	1	11	20
Apprch %	0	0	0		33.3	66.7	0		33.3	0	66.7		0	90.9	9.1		
Total %	0	0	0	0	10	20	0	30	5	0	10	15	0	50	5	55	

	Big Bear Blvd Southbound				North Shore Dr Westbound				Big Bear Blvd Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	**1**
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	0	**3**	3
01:30 PM	0	0	0	0	**1**	0	0	1	0	0	0	0	0	1	0	1	2
01:45 PM	0	0	0	0	1	**1**	0	**2**	**1**	0	1	**2**	0	2	0	2	**6**
Total Volume	0	0	0	0	2	1	0	3	1	0	2	3	0	6	0	6	12
% App. Total	0	0	0		66.7	33.3	0		33.3	0	66.7		0	100	0		
PHF	.000	.000	.000	.000	.500	.250	.000	.375	.250	.000	.500	.375	.000	.500	.000	.500	.500

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Drive

File Name : NShoreDr(SR-18) Sunday
Site Code : 1
Start Date : 3/4/2007
Page No : 2



Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				01:00 PM				12:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	2	0	2
+15 mins.	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	0	**3**
+45 mins.	0	0	0	0	0	0	0	0	**1**	0	1	**2**	0	1	0	1
Total Volume	0	0	0	0	0	3	0	3	1	0	2	3	0	6	0	6
% App. Total	0	0	0		0	100	0		33.3	0	66.7		0	100	0	
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.250	.000	.500	.375	.000	.500	.000	.500

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Drive

File Name : NShoreDr(SR-18) Sunday
Site Code : 1
Start Date : 3/4/2007
Page No : 1

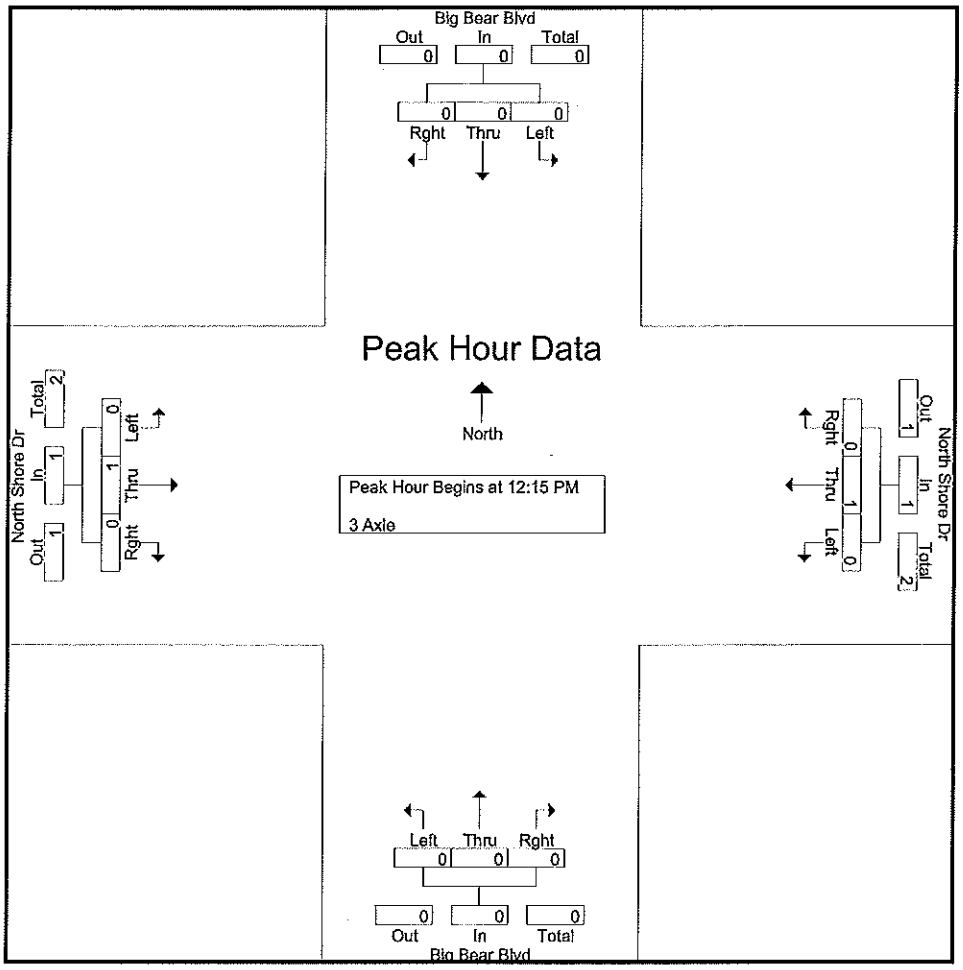
Groups Printed- 3 Axle

	Big Bear Blvd Southbound				North Shore Dr Westbound				Big Bear Blvd Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0		
Total %	0	0	0	0	0	50	0	50	0	0	0	0	0	50	0	50	

	Big Bear Blvd Southbound				North Shore Dr Westbound				Big Bear Blvd Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15 PM																	
12:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.500

City of: Big Bear
N/S: Big Bear Blvd
E/W: North Shore Drive

File Name : NShoreDr(SR-18) Sunday
Site Code : 1
Start Date : 3/4/2007
Page No : 2



Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1

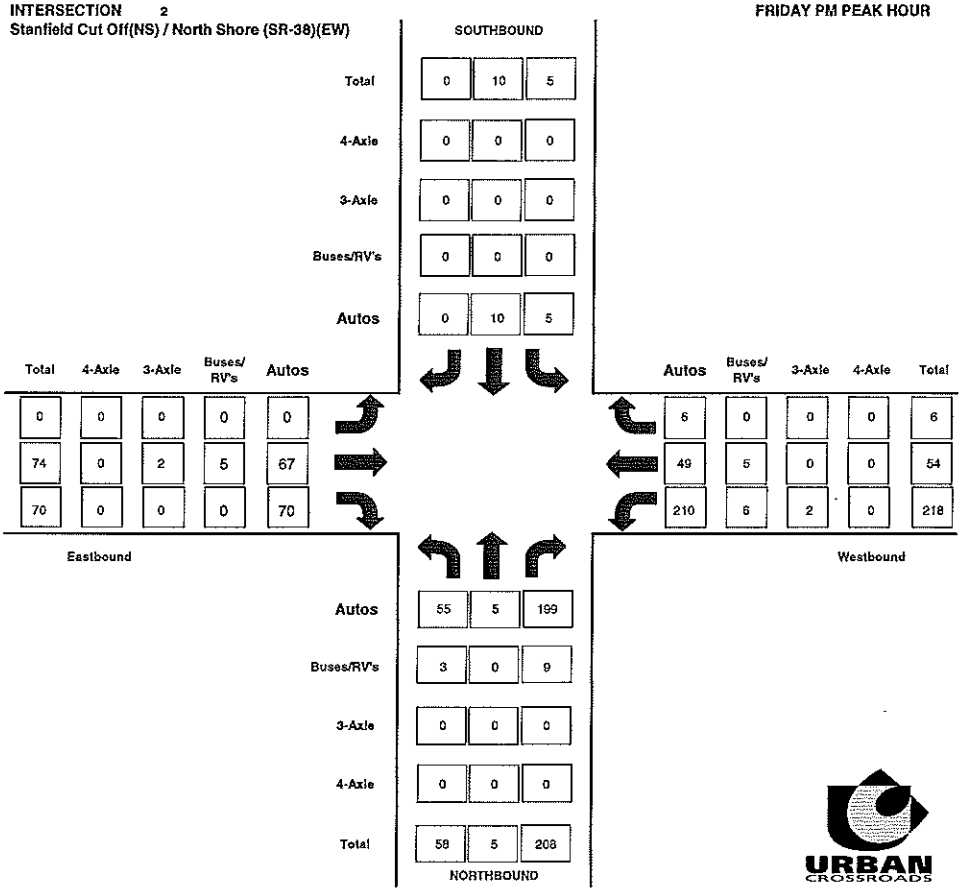
Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				12:00 PM				12:15 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250

PASSENGER CAR EQUIVALENCY PEAK HOUR COUNT SUMMARY

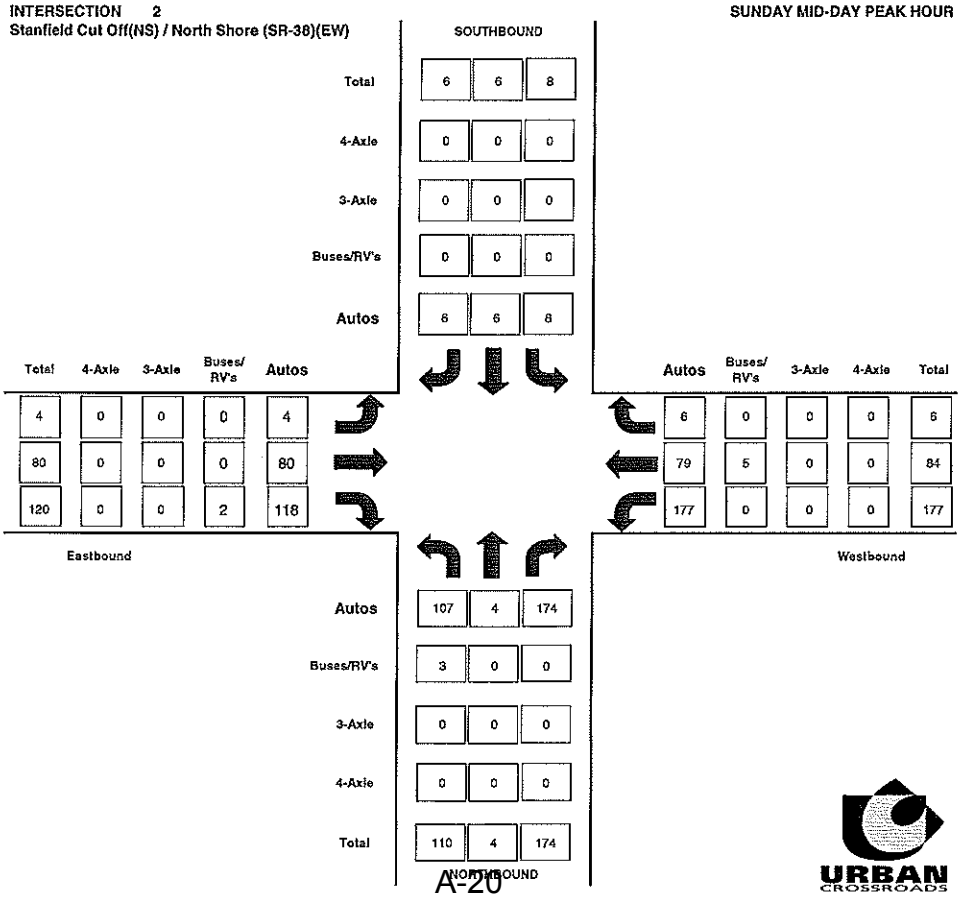
INTERSECTION 2
Stanfield Cut Off(NS) / North Shore (SR-38)(EW)

FRIDAY PM PEAK HOUR



INTERSECTION 2
Stanfield Cut Off(NS) / North Shore (SR-38)(EW)

SUNDAY MID-DAY PEAK HOUR



City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Dr

Traffic Data Consultants

File Name : Stanfield&NShoreDr Combined Fri
Site Code : 2
Start Date : 3/2/2007
Page No : 1

Groups Printed- Combined Groups

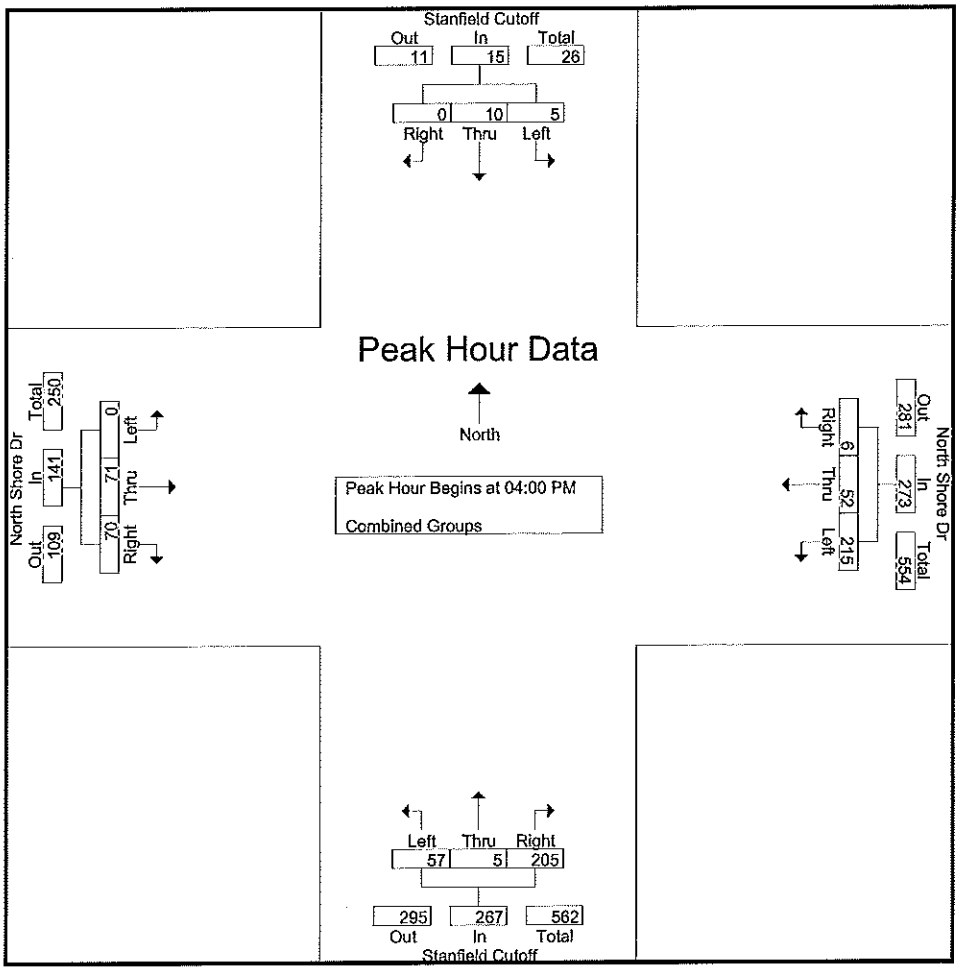
	Stanfield Cutoff Southbound				North Shore Dr Westbound				Stanfield Cutoff Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	4	0	5	64	15	2	81	18	1	48	67	0	19	22	41	194
04:15 PM	0	6	0	6	46	10	0	56	11	2	53	66	0	21	20	41	169
04:30 PM	1	0	0	1	57	15	2	74	12	1	54	67	0	11	17	28	170
04:45 PM	3	0	0	3	48	12	2	62	16	1	50	67	0	20	11	31	163
Total	5	10	0	15	215	52	6	273	57	5	205	267	0	71	70	141	696
05:00 PM	1	3	0	4	44	9	2	55	15	4	62	81	0	12	12	24	164
05:15 PM	2	2	0	4	41	8	1	50	14	2	38	54	0	20	15	35	143
05:30 PM	0	2	1	3	40	10	0	50	12	2	48	62	0	11	10	21	136
05:45 PM	3	1	0	4	32	6	1	39	13	0	42	55	0	25	21	46	144
Total	6	8	1	15	157	33	4	194	54	8	190	252	0	68	58	126	587
Grand Total	11	18	1	30	372	85	10	467	111	13	395	519	0	139	128	267	1283
Apprch %	36.7	60	3.3		79.7	18.2	2.1		21.4	2.5	76.1		0	52.1	47.9		
Total %	0.9	1.4	0.1	2.3	29	6.6	0.8	36.4	8.7	1	30.8	40.5	0	10.8	10	20.8	

	Stanfield Cutoff Southbound				North Shore Dr Westbound				Stanfield Cutoff Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	4	0	5	**64**	**15**	**2**	**81**	**18**	1	48	**67**	0	19	**22**	**41**	**194**
04:15 PM	0	**6**	0	**6**	46	10	0	56	11	**2**	53	66	0	**21**	20	41	169
04:30 PM	1	0	0	1	57	15	2	74	12	1	**54**	67	0	11	17	28	170
04:45 PM	**3**	0	0	3	48	12	2	62	16	1	50	67	0	20	11	31	163
Total Volume	5	10	0	15	215	52	6	273	57	5	205	267	0	71	70	141	696
% App. Total	33.3	66.7	0		78.8	19	2.2		21.3	1.9	76.8		0	50.4	49.6		
PHF	.417	.417	.000	.625	.840	.867	.750	.843	.792	.625	.949	.996	.000	.845	.795	.860	.897

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Dr

Traffic Data Consultants

File Name : Stanfield&NShoreDr Combined Fri
Site Code : 2
Start Date : 3/2/2007
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:15 PM				04:00 PM			
+0 mins.	1	4	0	5	**64**	**15**	**2**	**81**	11	2	53	66	0	19	**22**	**41**
+15 mins.	0	**6**	0	**6**	46	10	0	56	12	1	54	67	0	**21**	20	41
+30 mins.	1	0	0	1	57	15	2	74	**16**	1	50	67	0	11	17	28
+45 mins.	**3**	0	0	3	48	12	2	62	15	**4**	**62**	**81**	0	20	11	31
Total Volume	5	10	0	15	215	52	6	273	54	8	219	281	0	71	70	141
% App. Total	33.3	66.7	0		78.8	19	2.2		19.2	2.8	77.9		0	50.4	49.6	
PHF	.417	.417	.000	.625	.840	.867	.750	.843	.844	.500	.883	.867	.000	.845	.795	.860

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Dr

Traffic Data Consultants

File Name : Stanfield@NSHoreDr
Site Code : 2
Start Date : 3/2/2007
Page No : 1

Groups Printed- Passenger Vehicles

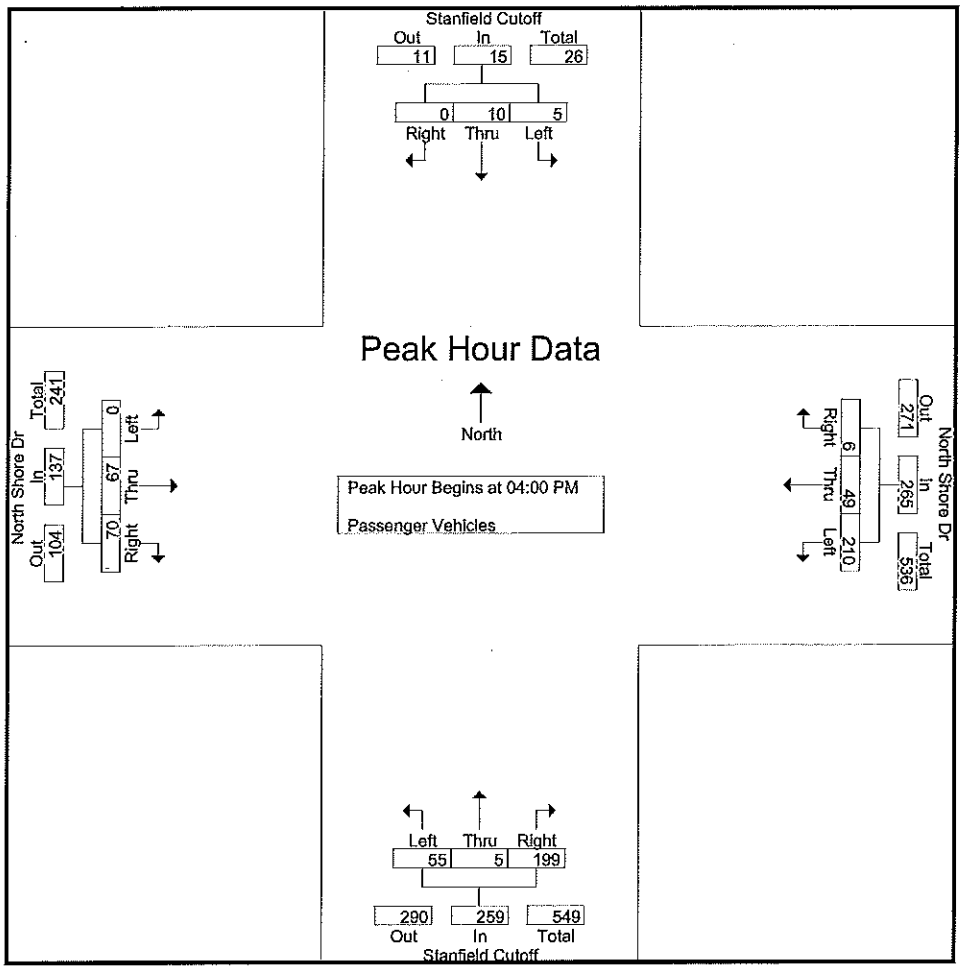
	Stanfield Cutoff Southbound				North Shore Dr Westbound				Stanfield Cutoff Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	4	0	5	61	14	2	77	16	1	48	65	0	18	22	40	187
04:15 PM	0	6	0	6	46	10	0	56	11	2	52	65	0	21	20	41	168
04:30 PM	1	0	0	1	56	14	2	72	12	1	52	65	0	9	17	26	164
04:45 PM	3	0	0	3	47	11	2	60	16	1	47	64	0	19	11	30	157
Total	5	10	0	15	210	49	6	265	55	5	199	259	0	67	70	137	676
05:00 PM	1	3	0	4	44	8	2	54	13	4	61	78	0	11	12	23	159
05:15 PM	2	2	0	4	39	8	1	48	14	2	38	54	0	17	14	31	137
05:30 PM	0	2	1	3	38	10	0	48	12	2	48	62	0	11	10	21	134
05:45 PM	2	1	0	3	30	6	1	37	13	0	42	55	0	24	20	44	139
Total	5	8	1	14	151	32	4	187	52	8	189	249	0	63	56	119	569
Grand Total	10	18	1	29	361	81	10	452	107	13	388	508	0	130	126	256	1245
Apprch %	34.5	62.1	3.4		79.9	17.9	2.2		21.1	2.6	76.4		0	50.8	49.2		
Total %	0.8	1.4	0.1	2.3	29	6.5	0.8	36.3	8.6	1	31.2	40.8	0	10.4	10.1	20.6	

	Stanfield Cutoff Southbound				North Shore Dr Westbound				Stanfield Cutoff Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	4	0	5	**61**	**14**	**2**	**77**	**16**	1	48	**65**	0	18	**22**	40	**187**
04:15 PM	0	**6**	0	**6**	46	10	0	56	11	**2**	**52**	65	0	**21**	20	**41**	168
04:30 PM	1	0	0	1	56	14	2	72	12	1	52	65	0	9	17	26	164
04:45 PM	**3**	0	0	3	47	11	2	60	16	1	47	64	0	19	11	30	157
Total Volume	5	10	0	15	210	49	6	265	55	5	199	259	0	67	70	137	676
% App. Total	33.3	66.7	0		79.2	18.5	2.3		21.2	1.9	76.8		0	48.9	51.1		
PHF	.417	.417	.000	.625	.861	.875	.750	.860	.859	.625	.957	.996	.000	.798	.795	.835	.904

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Dr

Traffic Data Consultants

File Name : Stanfield@NSHoreDr
Site Code : 2
Start Date : 3/2/2007
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:15 PM				04:00 PM			
+0 mins.	1	4	0	5	**61**	**14**	**2**	**77**	11	2	52	65	0	18	**22**	40
+15 mins.	0	**6**	0	**6**	46	10	0	56	12	1	52	65	0	**21**	20	**41**
+30 mins.	1	0	0	1	56	14	2	72	**16**	1	47	64	0	9	17	26
+45 mins.	**3**	0	0	3	47	11	2	60	13	**4**	**61**	**78**	0	19	11	30
Total Volume	5	10	0	15	210	49	6	265	52	8	212	272	0	67	70	137
% App. Total	33.3	66.7	0		79.2	18.5	2.3		19.1	2.9	77.9		0	48.9	51.1	
PHF	.417	.417	.000	.625	.861	.875	.750	.860	.813	.500	.869	.872	.000	.798	.795	.835

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Dr

Traffic Data Consultants

File Name : Stanfield@NSHoreDr
Site Code : 2
Start Date : 3/2/2007
Page No : 1

Groups Printed- Large 2 Axle

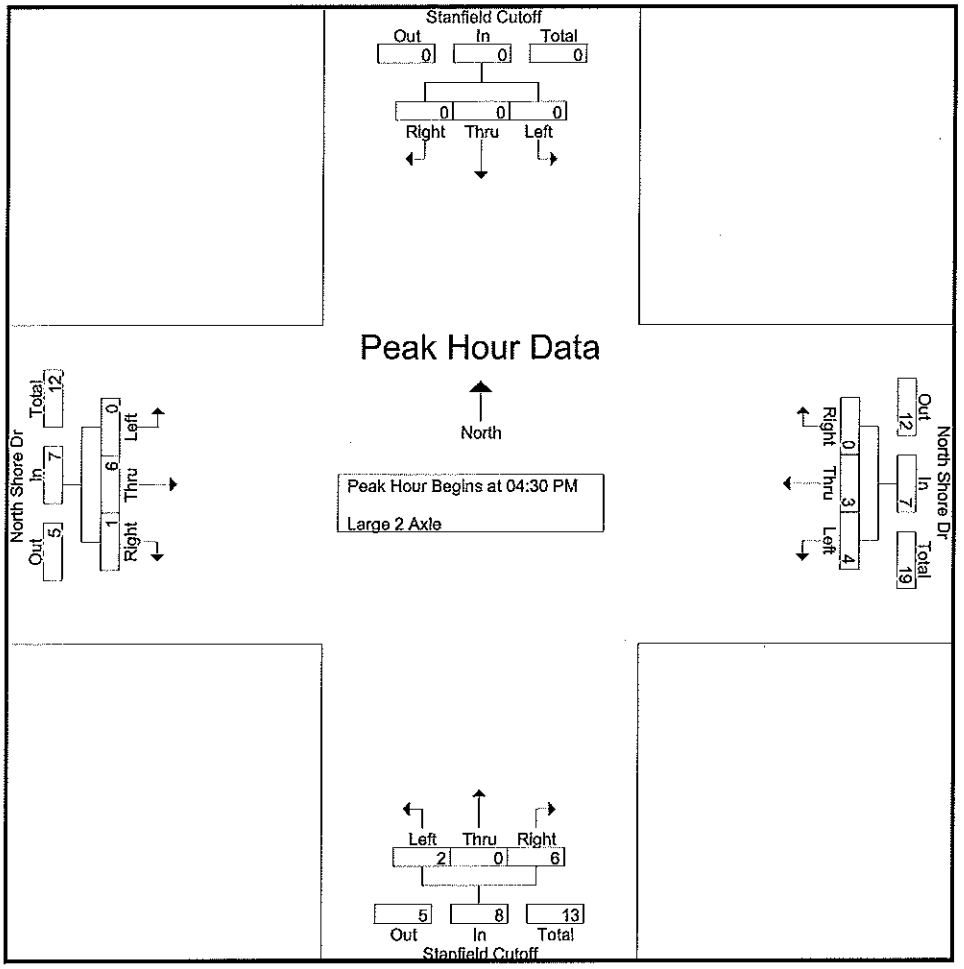
	Stanfield Cutoff Southbound				North Shore Dr Westbound				Stanfield Cutoff Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	2	1	0	3	2	0	0	2	0	1	0	1	6
04:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
04:30 PM	0	0	0	0	1	1	0	2	0	0	2	2	0	1	0	1	5
04:45 PM	0	0	0	0	1	1	0	2	0	0	3	3	0	1	0	1	6
Total	0	0	0	0	4	3	0	7	2	0	6	8	0	3	0	3	18
05:00 PM	0	0	0	0	0	1	0	1	2	0	1	3	0	1	0	1	5
05:15 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	3	1	4	6
05:30 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
05:45 PM	1	0	0	1	2	0	0	2	0	0	0	0	0	1	1	2	5
Total	1	0	0	1	6	1	0	7	2	0	1	3	0	5	2	7	18
Grand Total	1	0	0	1	10	4	0	14	4	0	7	11	0	8	2	10	36
Apprch %	100	0	0		71.4	28.6	0		36.4	0	63.6		0	80	20		
Total %	2.8	0	0	2.8	27.8	11.1	0	38.9	11.1	0	19.4	30.6	0	22.2	5.6	27.8	

	Stanfield Cutoff Southbound				North Shore Dr Westbound				Stanfield Cutoff Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	1	1	0	2	0	0	2	2	0	1	0	1	5
04:45 PM	0	0	0	0	1	1	0	2	0	0	3	3	0	1	0	1	6
05:00 PM	0	0	0	0	0	1	0	1	2	0	1	3	0	1	0	1	5
05:15 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	3	1	4	6
Total Volume	0	0	0	0	4	3	0	7	2	0	6	8	0	6	1	7	22
% App. Total	0	0	0		57.1	42.9	0		25	0	75		0	85.7	14.3		
PHF	.000	.000	.000	.000	.500	.750	.000	.875	.250	.000	.500	.667	.000	.500	.250	.438	.917

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Dr

Traffic Data Consultants

File Name : Stanfield@NSHoreDr
Site Code : 2
Start Date : 3/2/2007
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				04:15 PM				04:30 PM			
+0 mins.	0	0	0	0	**2**	**1**	0	**3**	0	0	1	1	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	2	2	0	1	0	1
+30 mins.	0	0	0	0	1	1	0	2	0	0	**3**	**3**	0	1	0	1
+45 mins.	**1**	0	0	**1**	1	1	0	2	**2**	0	1	3	0	**3**	**1**	**4**
Total Volume	1	0	0	1	4	3	0	7	2	0	7	9	0	6	1	7
% App. Total	100	0	0		57.1	42.9	0		22.2	0	77.8		0	85.7	14.3	
PHF	.250	.000	.000	.250	.500	.750	.000	.583	.250	.000	.583	.750	.000	.500	.250	.438

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Dr

Traffic Data Consultants

File Name : Stanfield@NSHoreDr
Site Code : 2
Start Date : 3/2/2007
Page No : 1

Groups Printed- 3 Axle

	Stanfield Cutoff Southbound				North Shore Dr Westbound				Stanfield Cutoff Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
Apprch %	0	0	0		100	0	0		0	0	0		0	100	0		
Total %	0	0	0	0	50	0	0	50	0	0	0	0	0	50	0	50	

	Stanfield Cutoff Southbound				North Shore Dr Westbound				Stanfield Cutoff Northbound				North Shore Dr Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
% App. Total	0	0	0		100	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.500

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Dr

Traffic Data Consultants

File Name : Stanfield@NSHoreDr
Site Code : 2
Start Date : 3/2/2007
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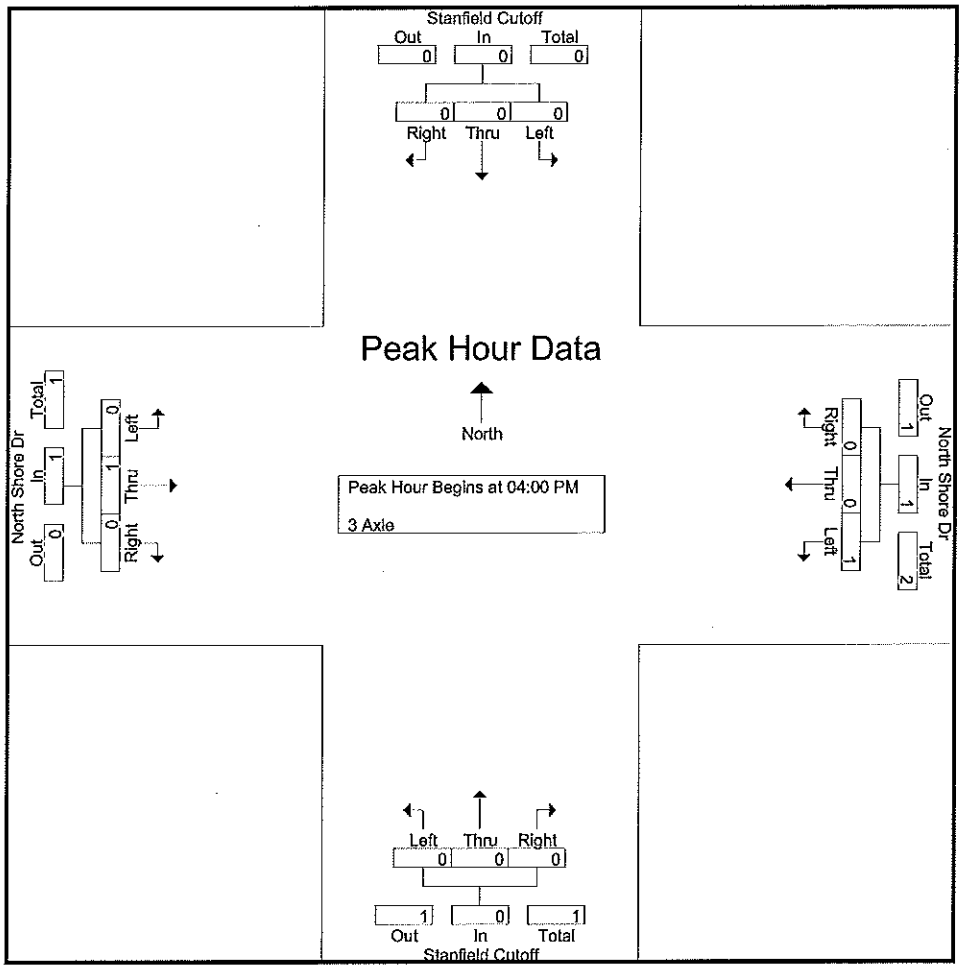


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1
% App. Total	0	0	0		100	0	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Drive

File Name : Stanfield&NShoreDr Combined Sun
Site Code : 2
Start Date : 3/4/2007
Page No : 1

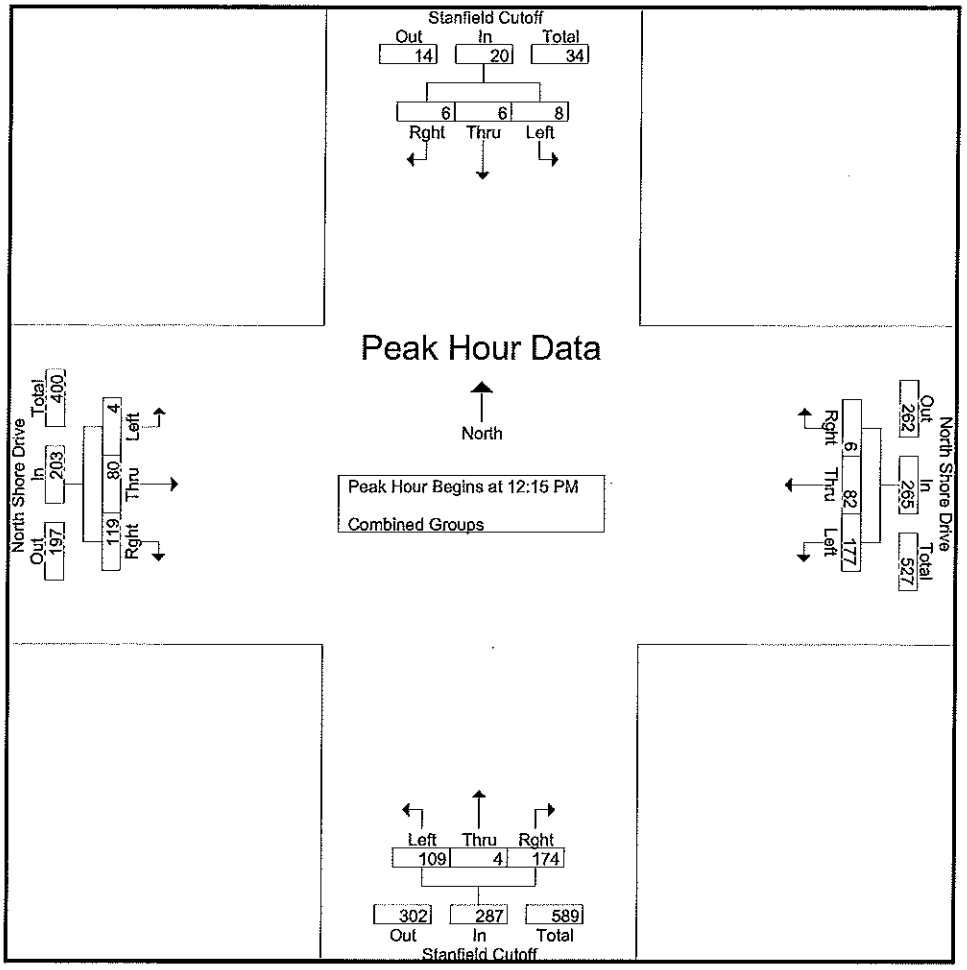
Groups Printed- Combined Groups

	Stanfield Cutoff Southbound				North Shore Drive Westbound				Stanfield Cutoff Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	2	1	1	4	39	15	4	58	32	1	39	72	0	16	24	40	174
12:15 PM	2	3	3	8	50	25	1	76	23	0	36	59	1	17	25	43	186
12:30 PM	2	1	2	5	47	21	2	70	36	0	41	77	2	21	35	58	210
12:45 PM	2	1	1	4	33	25	2	60	23	2	56	81	0	16	25	41	186
Total	8	6	7	21	169	86	9	264	114	3	172	289	3	70	109	182	756
01:00 PM	2	1	0	3	47	11	1	59	27	2	41	70	1	26	34	61	193
01:15 PM	4	0	1	5	48	14	3	65	22	0	54	76	0	21	19	40	186
01:30 PM	1	3	0	4	34	20	2	56	30	1	62	93	0	14	27	41	194
01:45 PM	0	1	0	1	26	16	3	45	25	1	31	57	0	28	25	53	156
Total	7	5	1	13	155	61	9	225	104	4	188	296	1	89	105	195	729
Grand Total	15	11	8	34	324	147	18	489	218	7	360	585	4	159	214	377	1485
Apprch %	44.1	32.4	23.5		66.3	30.1	3.7		37.3	1.2	61.5		1.1	42.2	56.8		
Total %	1	0.7	0.5	2.3	21.8	9.9	1.2	32.9	14.7	0.5	24.2	39.4	0.3	10.7	14.4	25.4	

	Stanfield Cutoff Southbound				North Shore Drive Westbound				Stanfield Cutoff Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15 PM																	
12:15 PM	**2**	**3**	**3**	**8**	**50**	**25**	1	**76**	23	0	36	59	1	17	25	43	186
12:30 PM	2	1	2	5	47	21	**2**	70	**36**	0	41	77	**2**	21	**35**	58	**210**
12:45 PM	2	1	1	4	33	25	2	60	23	**2**	**56**	**81**	0	16	25	41	186
01:00 PM	2	1	0	3	47	11	1	59	27	2	41	70	1	**26**	34	**61**	193
Total Volume	8	6	6	20	177	82	6	265	109	4	174	287	4	80	119	203	775
% App. Total	40	30	30		66.8	30.9	2.3		38	1.4	60.6		2	39.4	58.6		
PHF	1.000	.500	.500	.625	.885	.820	.750	.872	.757	.500	.777	.886	.500	.769	.850	.832	.923

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Drive

File Name : Stanfield&NShoreDr Combined Sun
Site Code : 2
Start Date : 3/4/2007
Page No : 2



Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	12:00 PM				12:15 PM				12:45 PM				12:15 PM			
+0 mins.	**2**	1	**1**	4	**50**	**25**	1	**76**	23	**2**	56	81	1	17	25	43
+15 mins.	2	**3**	**3**	**8**	47	21	**2**	70	27	2	41	70	**2**	21	**35**	58
+30 mins.	2	1	2	5	33	25	2	60	22	0	54	76	0	16	25	41
+45 mins.	2	1	1	4	47	11	1	59	**30**	1	**62**	**93**	1	**26**	34	**61**
Total Volume	8	6	7	21	177	82	6	265	102	5	213	320	4	80	119	203
% App. Total	38.1	28.6	33.3		66.8	30.9	2.3		31.9	1.6	66.6		2	39.4	58.6	
PHF	1.000	.500	.583	.656	.885	.820	.750	.872	.850	.625	.859	.860	.500	.769	.850	.832

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Drive

File Name : Stanfield@NShoreDr Sunday
Site Code : 2
Start Date : 3/4/2007
Page No : 1

Groups Printed- Passenger Vehicles

	Stanfield Cutoff Southbound				North Shore Drive Westbound				Stanfield Cutoff Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	2	1	1	4	39	15	4	58	32	1	39	72	0	16	24	40	174
12:15 PM	2	3	3	8	50	23	1	74	23	0	36	59	1	17	25	43	184
12:30 PM	2	1	2	5	47	21	2	70	36	0	41	77	2	21	35	58	210
12:45 PM	2	1	1	4	33	25	2	60	22	2	56	80	0	16	25	41	185
Total	8	6	7	21	169	84	9	262	113	3	172	288	3	70	109	182	753
01:00 PM	2	1	0	3	47	10	1	58	26	2	41	69	1	26	33	60	190
01:15 PM	4	0	1	5	48	14	3	65	22	0	53	75	0	19	19	38	183
01:30 PM	1	3	0	4	34	20	2	56	29	1	62	92	0	14	27	41	193
01:45 PM	0	1	0	1	25	16	3	44	25	1	30	56	0	27	23	50	151
Total	7	5	1	13	154	60	9	223	102	4	186	292	1	86	102	189	717
Grand Total	15	11	8	34	323	144	18	485	215	7	358	580	4	156	211	371	1470
Apprch %	44.1	32.4	23.5		66.6	29.7	3.7		37.1	1.2	61.7		1.1	42	56.9		
Total %	1	0.7	0.5	2.3	22	9.8	1.2	33	14.6	0.5	24.4	39.5	0.3	10.6	14.4	25.2	

	Stanfield Cutoff Southbound				North Shore Drive Westbound				Stanfield Cutoff Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15 PM																	
12:15 PM	**2**	**3**	**3**	**8**	**50**	23	**1**	**74**	23	0	36	59	1	17	25	43	184
12:30 PM	2	1	2	5	47	21	**2**	70	**36**	0	41	77	**2**	21	**35**	58	**210**
12:45 PM	2	1	1	4	33	**25**	2	60	22	**2**	**56**	**80**	0	16	25	41	185
01:00 PM	2	1	0	3	47	10	1	58	26	2	41	69	1	**26**	33	**60**	190
Total Volume	8	6	6	20	177	79	6	262	107	4	174	285	4	80	118	202	769
% App. Total	40	30	30		67.6	30.2	2.3		37.5	1.4	61.1		2	39.6	58.4		
PHF	1.000	.500	.500	.625	.885	.790	.750	.885	.743	.500	.777	.891	.500	.769	.843	.842	.915

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Drive

File Name : Stanfield@NShoreDr Sunday
Site Code : 2
Start Date : 3/4/2007
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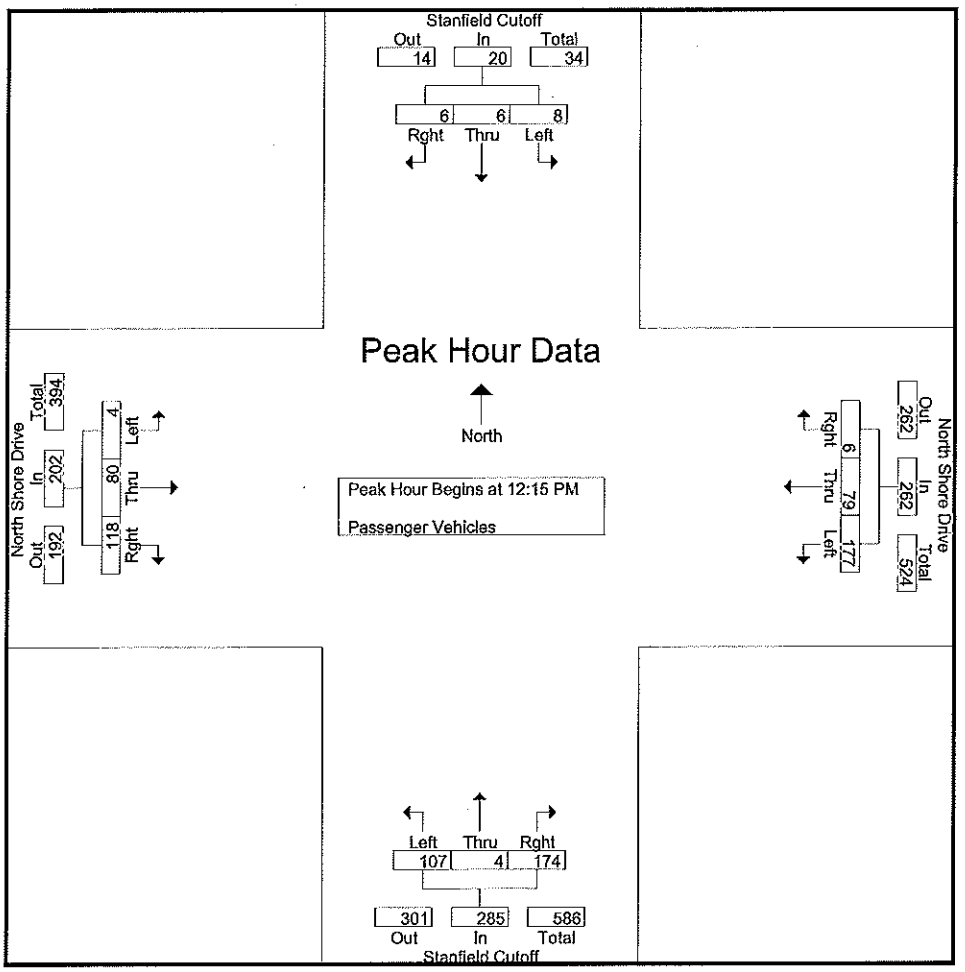


Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				12:45 PM				12:15 PM			
+0 mins.	**2**	1	1	4	39	15	**4**	58	22	**2**	56	80	1	17	25	43
+15 mins.	2	**3**	**3**	**8**	**50**	23	1	**74**	26	2	41	69	**2**	21	**35**	58
+30 mins.	2	1	2	5	47	21	2	70	22	0	53	75	0	16	25	41
+45 mins.	2	1	**1**	4	33	**25**	2	60	**29**	1	**62**	**92**	1	**26**	33	**60**
Total Volume	8	6	7	21	169	84	9	262	99	5	212	316	4	80	118	202
% App. Total	38.1	28.6	33.3		64.5	32.1	3.4		31.3	1.6	67.1		2	39.6	58.4	
PHF	1.000	.500	.583	.656	.845	.840	.563	.885	.853	.625	.855	.859	.500	.769	.843	.842

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Drive

Traffic Data Consultants

File Name : Stanfield@NShoreDr Sunday
Site Code : 2
Start Date : 3/4/2007
Page No : 1

Groups Printed- Large 2 Axle

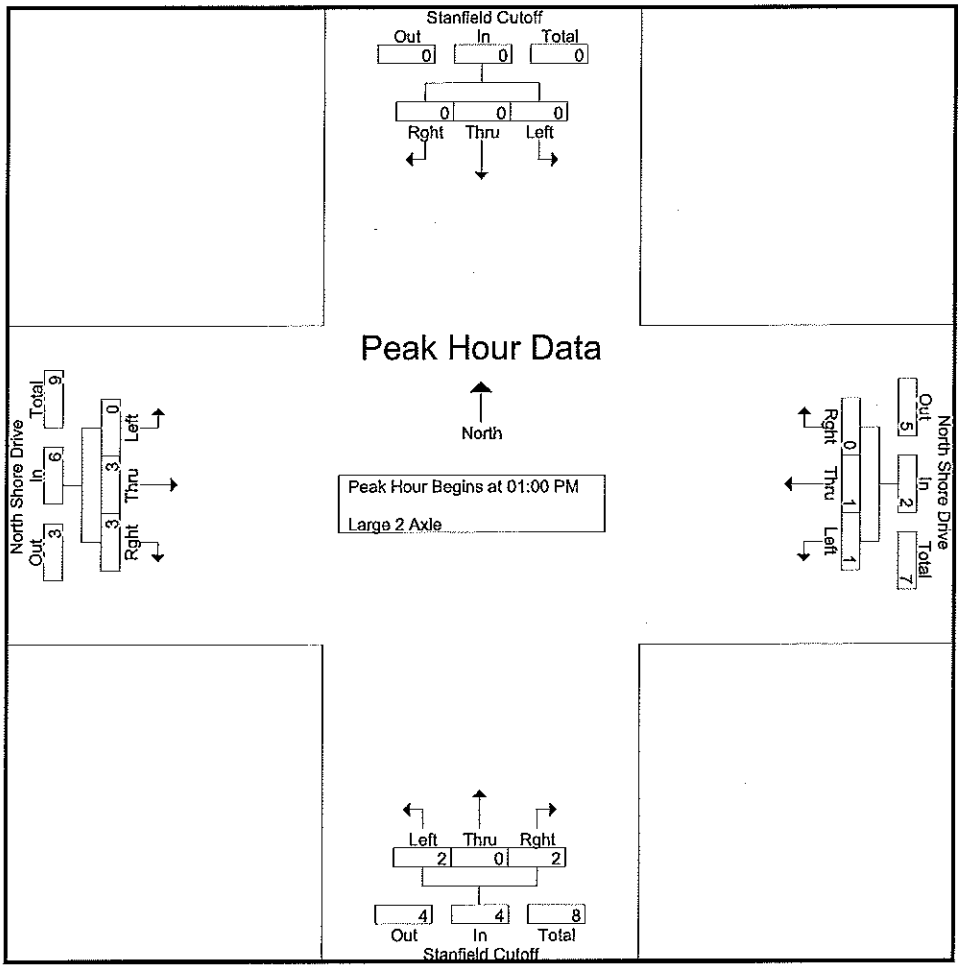
	Stanfield Cutoff Southbound				North Shore Drive Westbound				Stanfield Cutoff Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	0	0	0	0	2	0	2	1	0	0	1	0	0	0	0	3
01:00 PM	0	0	0	0	0	1	0	1	1	0	0	1	0	0	1	1	3
01:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	2	3
01:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
01:45 PM	0	0	0	0	1	0	0	1	0	0	1	1	0	1	2	3	5
Total	0	0	0	0	1	1	0	2	2	0	2	4	0	3	3	6	12
Grand Total	0	0	0	0	1	3	0	4	3	0	2	5	0	3	3	6	15
Apprch %	0	0	0		25	75	0		60	0	40		0	50	50		
Total %	0	0	0	0	6.7	20	0	26.7	20	0	13.3	33.3	0	20	20	40	

	Stanfield Cutoff Southbound				North Shore Drive Westbound				Stanfield Cutoff Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	0	0	0	0	0	**1**	0	**1**	**1**	0	0	**1**	0	0	1	1	3
01:15 PM	0	0	0	0	0	0	0	0	0	0	**1**	1	0	**2**	0	2	3
01:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
01:45 PM	0	0	0	0	**1**	0	0	1	0	0	1	1	0	1	**2**	**3**	**5**
Total Volume	0	0	0	0	1	1	0	2	2	0	2	4	0	3	3	6	12
% App. Total	0	0	0		50	50	0		50	0	50		0	50	50		
PHF	.000	.000	.000	.000	.250	.250	.000	.500	.500	.000	.500	1.000	.000	.375	.375	.500	.600

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Drive

Traffic Data Consultants

File Name : Stanfield@NShoreDr Sunday
Site Code : 2
Start Date : 3/4/2007
Page No : 2



Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				12:15 PM				12:45 PM				01:00 PM			
+0 mins.	0	0	0	0	0	**2**	0	**2**	**1**	0	0	**1**	0	0	1	1
+15 mins.	0	0	0	0	0	0	0	0	1	0	0	1	0	**2**	0	2
+30 mins.	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	1	0	0	1	0	1	**2**	**3**
Total Volume	0	0	0	0	0	3	0	3	3	0	1	4	0	3	3	6
% App. Total	0	0	0		0	100	0		75	0	25		0	50	50	
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.750	.000	.250	1.000	.000	.375	.375	.500

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Drive

Traffic Data Consultants

File Name : Stanfield@NShoreDr Sunday
Site Code : 2
Start Date : 3/4/2007
Page No : 1

Groups Printed- 3 Axle

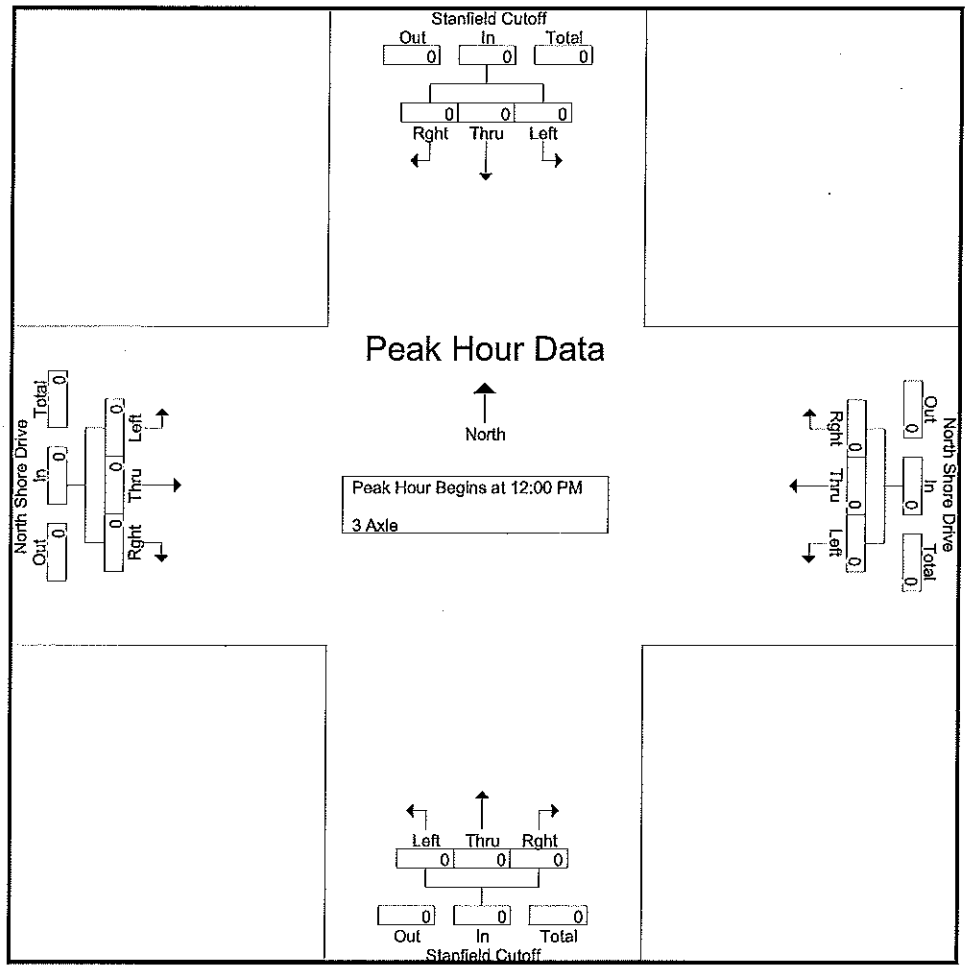
	Stanfield Cutoff Southbound				North Shore Drive Westbound				Stanfield Cutoff Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

	Stanfield Cutoff Southbound				North Shore Drive Westbound				Stanfield Cutoff Northbound				North Shore Drive Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of: Big Bear
N/S: Stanfield Cutoff
E/W: North Shore Drive

Traffic Data Consultants

File Name : Stanfield@NShoreDr Sunday
Site Code : 2
Start Date : 3/4/2007
Page No : 2



Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1

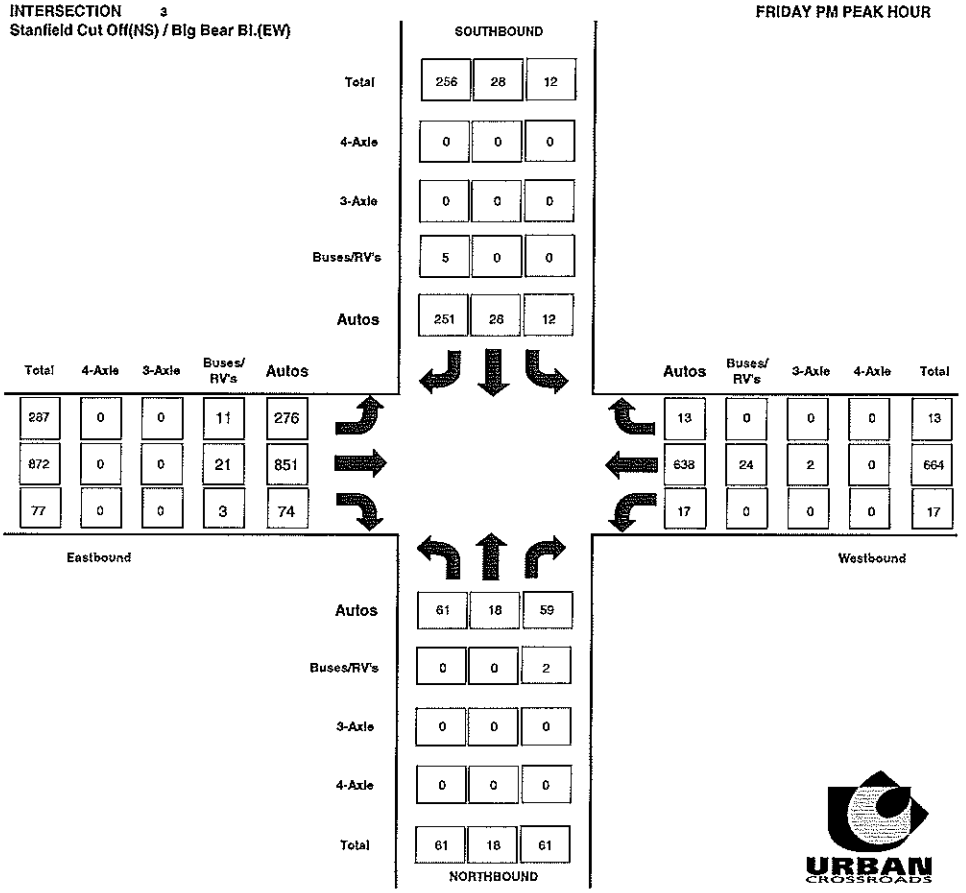
Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				12:00 PM				12:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

PASSENGER CAR EQUIVALENCY PEAK HOUR COUNT SUMMARY

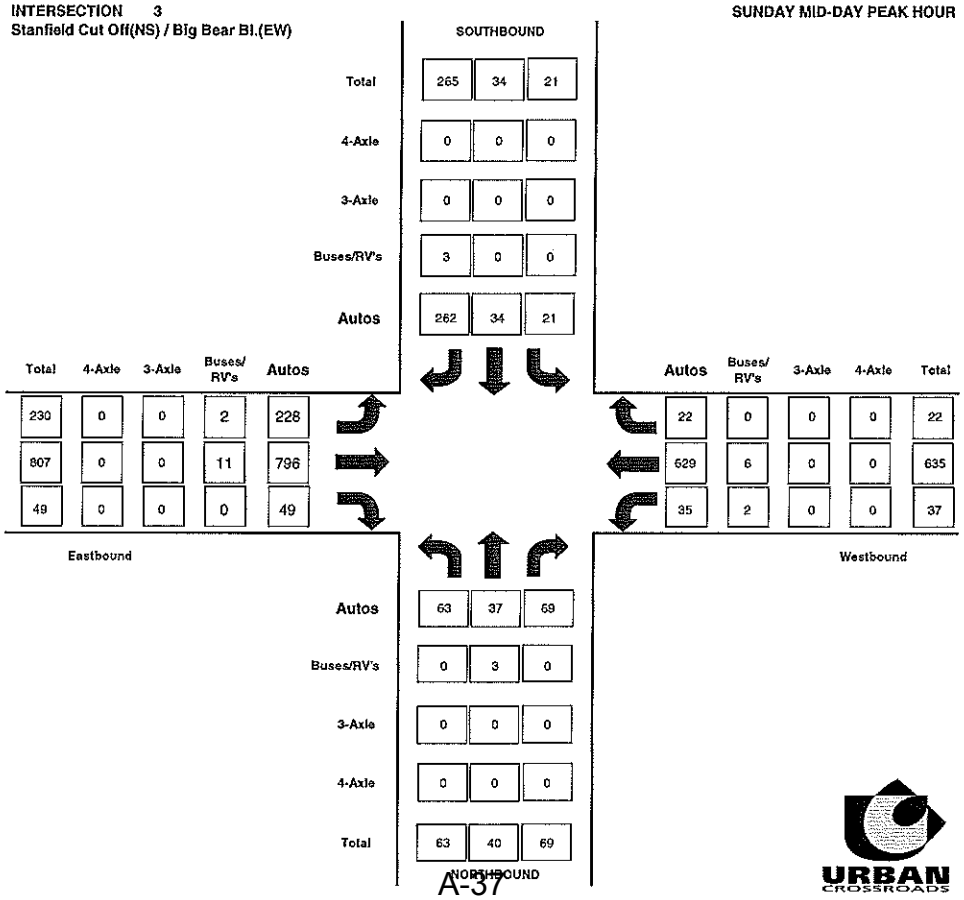
INTERSECTION 3
Stanfield Cut Off(NS) / Big Bear Bl.(EW)

FRIDAY PM PEAK HOUR



INTERSECTION 3
Stanfield Cut Off(NS) / Big Bear Bl.(EW)

SUNDAY MID-DAY PEAK HOUR



City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield&BigBear Combined Fri
Site Code : 3
Start Date : 3/2/2007
Page No : 1

Groups Printed- Combined Groups

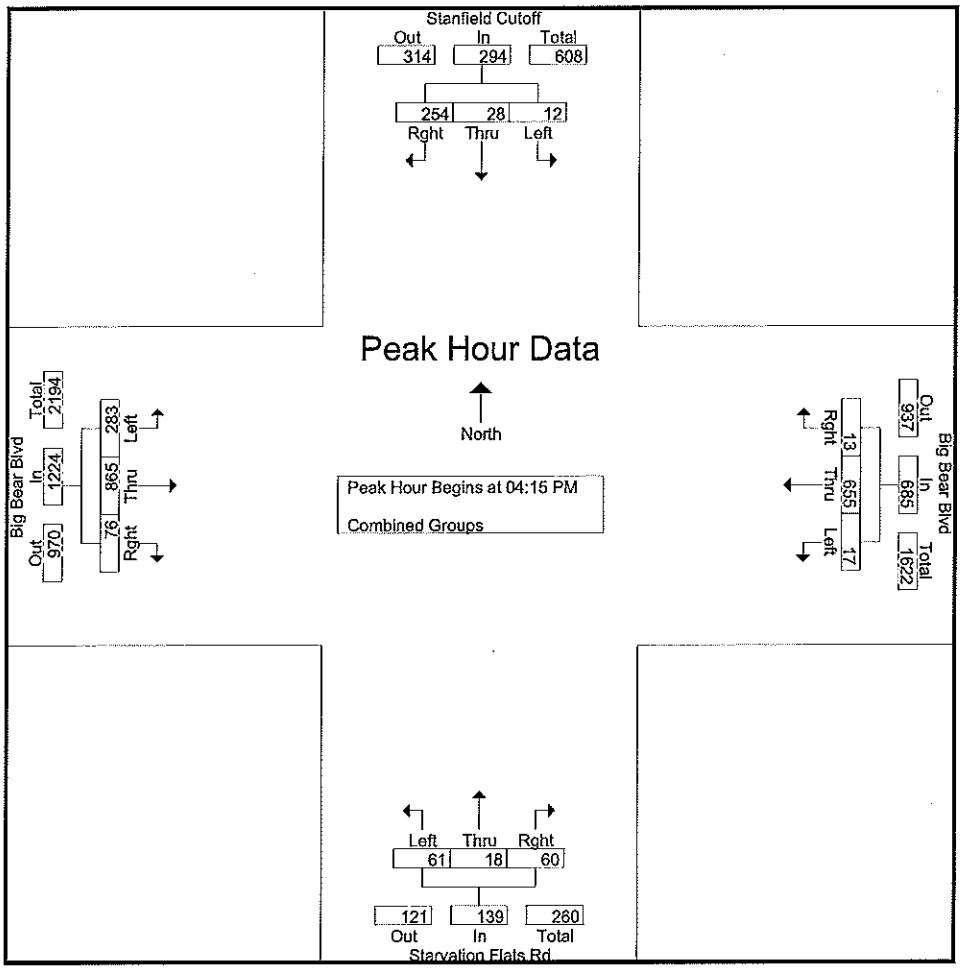
	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
04:00 PM	3	3	62	68	5	165	6	176	15	3	14	32	67	194	12	273	549
04:15 PM	2	11	65	78	6	154	5	165	12	4	19	35	75	203	16	294	572
04:30 PM	6	7	77	90	4	170	2	176	19	5	18	42	66	211	20	297	605
04:45 PM	1	4	58	63	2	164	1	167	14	5	12	31	73	223	17	313	574
Total	12	25	262	299	17	653	14	684	60	17	63	140	281	831	65	1177	2300
05:00 PM	3	6	54	63	5	167	5	177	16	4	11	31	69	228	23	320	591
05:15 PM	1	4	58	63	8	156	1	165	16	6	13	35	44	240	7	291	554
05:30 PM	3	5	46	54	7	143	1	151	10	5	8	23	49	237	12	298	526
05:45 PM	3	10	55	68	23	127	1	151	13	3	10	26	45	196	9	250	495
Total	10	25	213	248	43	593	8	644	55	18	42	115	207	901	51	1159	2166
Grand Total	22	50	475	547	60	1246	22	1328	115	35	105	255	488	1732	116	2336	4466
Apprch %	4	9.1	86.8		4.5	93.8	1.7		45.1	13.7	41.2		20.9	74.1	5		
Total %	0.5	1.1	10.6	12.2	1.3	27.9	0.5	29.7	2.6	0.8	2.4	5.7	10.9	38.8	2.6	52.3	

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	2	**11**	65	78	**6**	154	**5**	165	12	4	**19**	35	**75**	203	16	294	572
04:30 PM	**6**	7	**77**	**90**	4	**170**	2	176	**19**	**5**	18	**42**	66	211	20	297	**605**
04:45 PM	1	4	58	63	2	164	1	167	14	5	12	31	73	223	17	313	574
05:00 PM	3	6	54	63	5	167	5	**177**	16	4	11	31	69	**228**	**23**	**320**	591
Total Volume	12	28	254	294	17	655	13	685	61	18	60	139	283	865	76	1224	2342
% App. Total	4.1	9.5	86.4		2.5	95.6	1.9		43.9	12.9	43.2		23.1	70.7	6.2		
PHF	.500	.636	.825	.817	.708	.963	.650	.968	.803	.900	.789	.827	.943	.948	.826	.956	.968

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield&BigBear Combined Fri
Site Code : 3
Start Date : 3/2/2007
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:00 PM				04:15 PM			
+0 mins.	3	3	62	68	**6**	154	**5**	165	15	3	14	32	**75**	203	16	294
+15 mins.	2	**11**	65	78	4	**170**	2	176	12	4	**19**	35	66	211	20	297
+30 mins.	**6**	7	**77**	**90**	2	164	1	167	**19**	**5**	18	**42**	73	223	17	313
+45 mins.	1	4	58	63	5	167	5	**177**	14	5	12	31	69	**228**	**23**	**320**
Total Volume	12	25	262	299	17	655	13	685	60	17	63	140	283	865	76	1224
% App. Total	4	8.4	87.6		2.5	95.6	1.9		42.9	12.1	45		23.1	70.7	6.2	
PHF	.500	.568	.851	.831	.708	.963	.650	.968	.789	.850	.829	.833	.943	.948	.826	.956

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Friday
Site Code : 3
Start Date : 3/2/2007
Page No : 1

Groups Printed- Passenger Vehicles

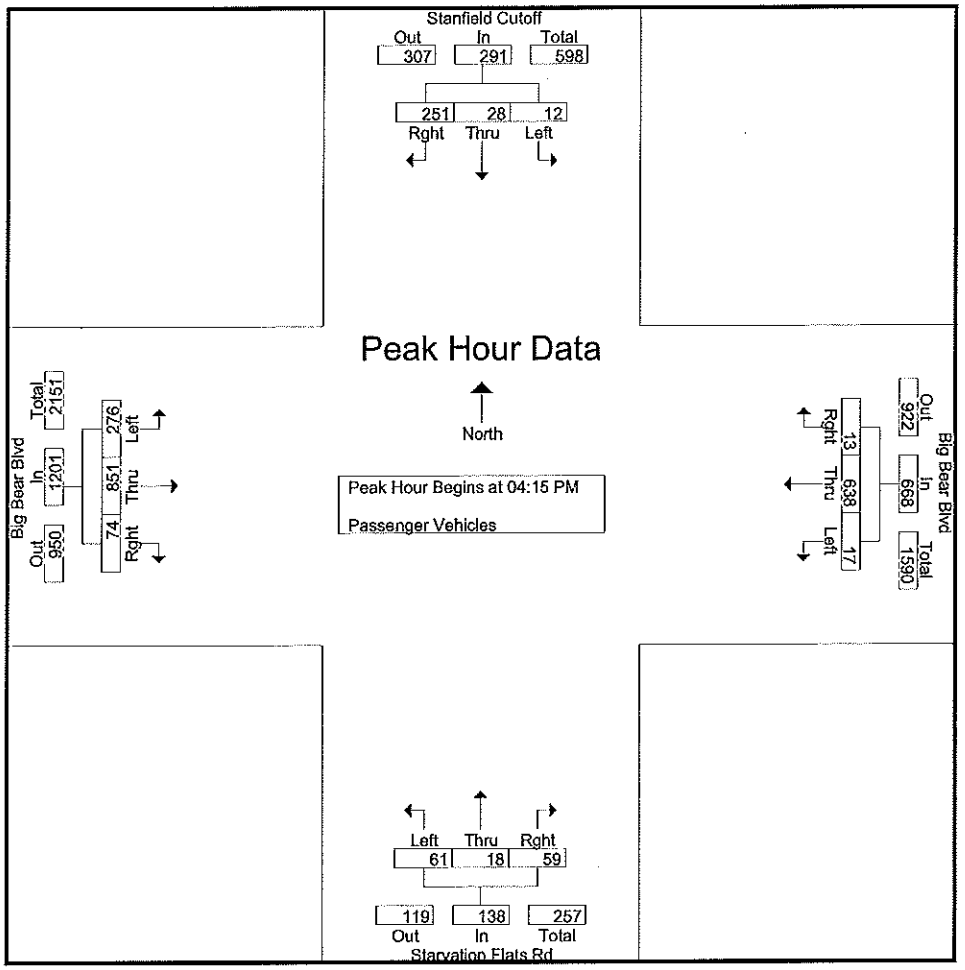
	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
04:00 PM	3	3	59	65	5	159	6	170	15	3	14	32	67	194	12	273	540
04:15 PM	2	11	64	77	6	149	5	160	12	4	19	35	74	200	16	290	562
04:30 PM	6	7	76	89	4	166	2	172	19	5	18	42	64	208	19	291	594
04:45 PM	1	4	57	62	2	160	1	163	14	5	12	31	71	218	17	306	562
Total	12	25	256	293	17	634	14	665	60	17	63	140	276	820	64	1160	2258
05:00 PM	3	6	54	63	5	163	5	173	16	4	10	30	67	225	22	314	580
05:15 PM	1	4	55	60	8	150	1	159	16	6	12	34	43	236	7	286	539
05:30 PM	3	4	45	52	7	141	1	149	10	5	7	22	49	234	12	295	518
05:45 PM	3	10	52	65	23	125	1	149	13	3	9	25	45	188	9	242	481
Total	10	24	206	240	43	579	8	630	55	18	38	111	204	883	50	1137	2118
Grand Total	22	49	462	533	60	1213	22	1295	115	35	101	251	480	1703	114	2297	4376
Apprch %	4.1	9.2	86.7		4.6	93.7	1.7		45.8	13.9	40.2		20.9	74.1	5		
Total %	0.5	1.1	10.6	12.2	1.4	27.7	0.5	29.6	2.6	0.8	2.3	5.7	11	38.9	2.6	52.5	

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	2	**11**	64	77	**6**	149	**5**	160	12	4	**19**	35	**74**	200	16	290	562
04:30 PM	**6**	7	**76**	**89**	4	**166**	2	172	**19**	**5**	18	**42**	64	208	19	291	**594**
04:45 PM	1	4	57	62	2	160	1	163	14	5	12	31	71	218	17	306	562
05:00 PM	3	6	54	63	5	163	5	**173**	16	4	10	30	67	**225**	**22**	**314**	580
Total Volume	12	28	251	291	17	638	13	668	61	18	59	138	276	851	74	1201	2298
% App. Total	4.1	9.6	86.3		2.5	95.5	1.9		44.2	13	42.8		23	70.9	6.2		
PHF	.500	.636	.826	.817	.708	.961	.650	.965	.803	.900	.776	.821	.932	.946	.841	.956	.967

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Friday
Site Code : 3
Start Date : 3/2/2007
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:00 PM				04:15 PM			
+0 mins.	3	3	59	65	**6**	149	**5**	160	15	3	14	32	**74**	200	16	290
+15 mins.	2	**11**	64	77	4	**166**	2	172	12	4	**19**	35	64	208	19	291
+30 mins.	**6**	7	**76**	**89**	2	160	1	163	**19**	**5**	18	**42**	71	218	17	306
+45 mins.	1	4	57	62	5	163	5	**173**	14	5	12	31	67	**225**	**22**	**314**
Total Volume	12	25	256	293	17	638	13	668	60	17	63	140	276	851	74	1201
% App. Total	4.1	8.5	87.4		2.5	95.5	1.9		42.9	12.1	45		23	70.9	6.2	
PHF	.500	.568	.842	.823	.708	.961	.650	.965	.789	.850	.829	.833	.932	.946	.841	.956

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Friday
Site Code : 3
Start Date : 3/2/2007
Page No : 1

Groups Printed- Large 2 Axle

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
04:00 PM	0	0	2	2	0	5	0	5	0	0	0	0	0	0	0	0	7
04:15 PM	0	0	1	1	0	5	0	5	0	0	0	0	1	3	0	4	10
04:30 PM	0	0	1	1	0	4	0	4	0	0	0	0	2	3	1	6	11
04:45 PM	0	0	1	1	0	4	0	4	0	0	0	0	2	5	0	7	12
Total	0	0	5	5	0	18	0	18	0	0	0	0	5	11	1	17	40
05:00 PM	0	0	0	0	0	3	0	3	0	0	1	1	2	3	1	6	10
05:15 PM	0	0	3	3	0	6	0	6	0	0	1	1	1	4	0	5	15
05:30 PM	0	1	1	2	0	2	0	2	0	0	1	1	0	3	0	3	8
05:45 PM	0	0	3	3	0	2	0	2	0	0	0	0	0	8	0	8	13
Total	0	1	7	8	0	13	0	13	0	0	3	3	3	18	1	22	46
Grand Total	0	1	12	13	0	31	0	31	0	0	3	3	8	29	2	39	86
Apprch %	0	7.7	92.3		0	100	0		0	0	100		20.5	74.4	5.1		
Total %	0	1.2	14	15.1	0	36	0	36	0	0	3.5	3.5	9.3	33.7	2.3	45.3	

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	**1**	**1**	0	4	0	4	0	0	0	0	**2**	3	**1**	6	11
04:45 PM	0	0	1	**1**	0	4	0	4	0	0	0	0	2	**5**	0	**7**	12
05:00 PM	0	0	0	0	0	3	0	3	0	0	**1**	**1**	2	3	1	6	10
05:15 PM	0	0	**3**	**3**	0	**6**	0	**6**	0	0	1	1	1	4	0	5	**15**
Total Volume	0	0	5	5	0	17	0	17	0	0	2	2	7	15	2	24	48
% App. Total	0	0	100		0	100	0		0	0	100		29.2	62.5	8.3		
PHF	.000	.000	.417	.417	.000	.708	.000	.708	.000	.000	.500	.500	.875	.750	.500	.857	.800

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Friday
Site Code : 3
Start Date : 3/2/2007
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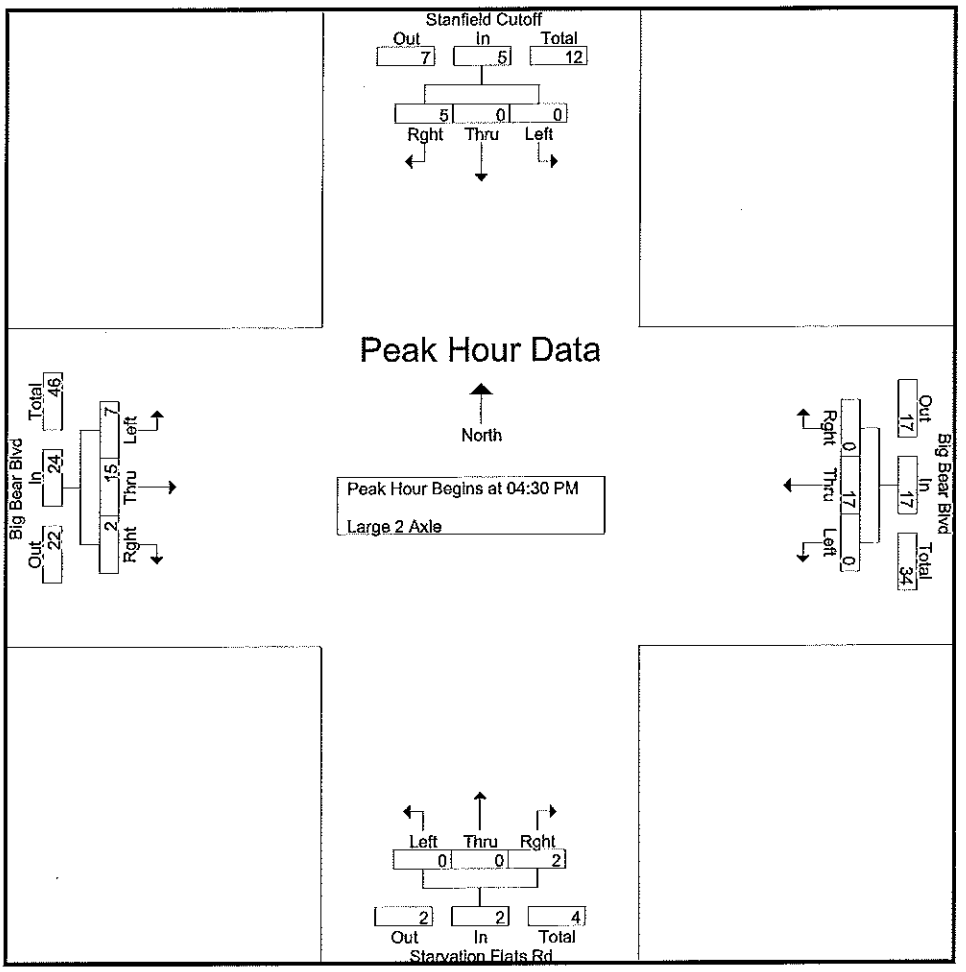

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				04:45 PM				04:30 PM			
+0 mins.	0	0	0	0	0	**5**	0	**5**	0	0	0	0	**2**	3	**1**	6
+15 mins.	0	0	**3**	**3**	0	5	0	5	0	0	**1**	**1**	2	**5**	0	**7**
+30 mins.	0	**1**	1	2	0	4	0	4	0	0	1	1	2	3	1	6
+45 mins.	0	0	3	3	0	4	0	4	0	0	1	1	1	4	0	5
Total Volume	0	1	7	8	0	18	0	18	0	0	3	3	7	15	2	24
% App. Total	0	12.5	87.5		0	100	0		0	0	100		29.2	62.5	8.3	
PHF	.000	.250	.583	.667	.000	.900	.000	.900	.000	.000	.750	.750	.875	.750	.500	.857

Traffic Data Consultants

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

File Name : Stanfield@BigBearBlvd Friday
Site Code : 3
Start Date : 3/2/2007
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Groups Printed- 3 Axle

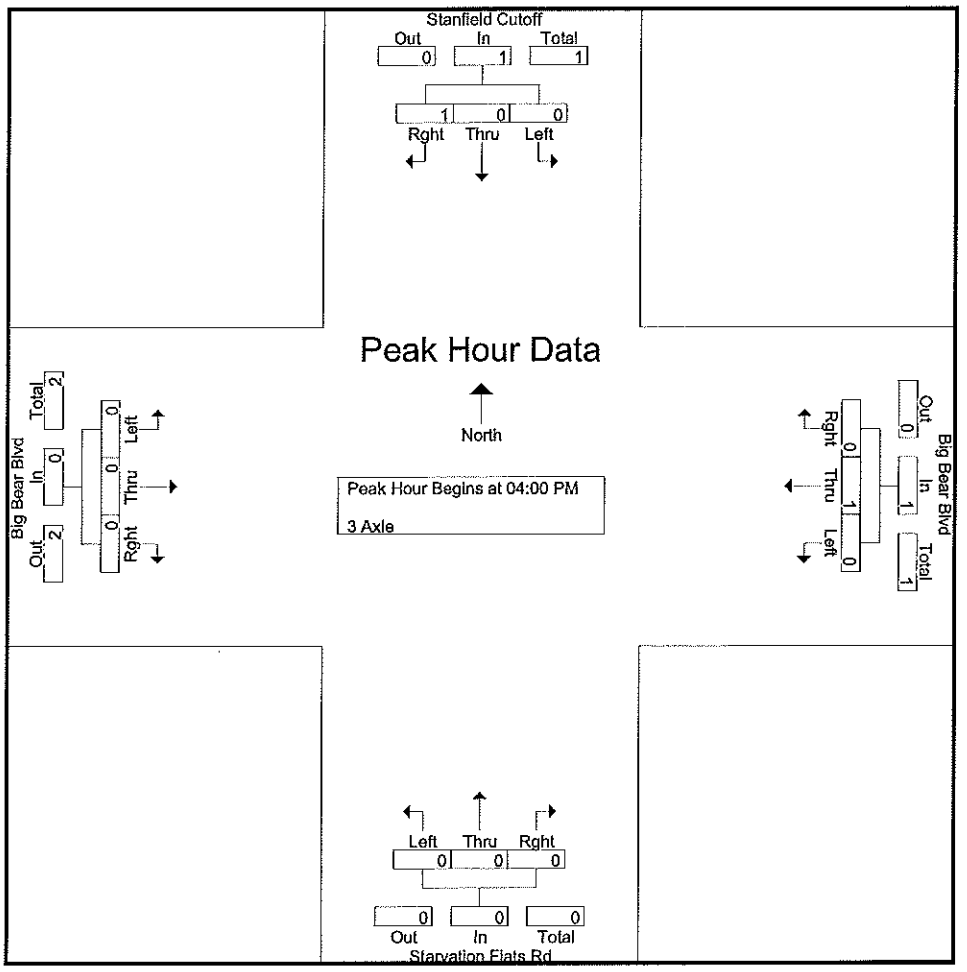
	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
04:00 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
Total	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0	2
Grand Total	0	0	1	1	0	2	0	2	0	0	1	1	0	0	0	0	4
Apprch %	0	0	100		0	100	0		0	0	100		0	0	0		
Total %	0	0	25	25	0	50	0	50	0	0	25	25	0	0	0	0	

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
% App. Total	0	0	100		0	100	0		0	0	0		0	0	0		
PHF	.000	.000	.250	.250	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Friday
Site Code : 3
Start Date : 3/2/2007
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				05:00 PM				04:00 PM			
+0 mins.	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Total Volume	0	0	1	1	0	1	0	1	0	0	1	1	0	0	0	0
% App. Total	0	0	100		0	100	0		0	0	100		0	0	0	
PHF	.000	.000	.250	.250	.000	.250	.000	.250	.000	.000	.250	.250	.000	.000	.000	.000

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield&BigBearBlvd Comb Sun
Site Code : 3
Start Date : 3/4/2007
Page No : 1

Groups Printed- Combined Groups

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	1	4	53	58	17	156	7	180	17	9	7	33	51	184	12	247	518
12:15 PM	3	15	99	117	2	149	6	157	9	4	9	22	22	104	8	134	430
12:30 PM	7	10	81	98	11	166	4	181	11	8	18	37	59	178	11	248	564
12:45 PM	4	11	58	73	7	173	6	186	23	16	21	60	59	198	12	269	588
Total	15	40	291	346	37	644	23	704	60	37	55	152	191	664	43	898	2100
01:00 PM	6	10	67	83	6	144	9	159	17	6	14	37	52	194	15	261	540
01:15 PM	4	3	58	65	12	150	3	165	12	9	16	37	59	233	11	303	570
01:30 PM	5	8	47	60	13	133	10	156	15	3	12	30	81	183	4	268	514
01:45 PM	5	11	43	59	12	140	6	158	18	9	16	43	67	197	6	270	530
Total	20	32	215	267	43	567	28	638	62	27	58	147	259	807	36	1102	2154
Grand Total	35	72	506	613	80	1211	51	1342	122	64	113	299	450	1471	79	2000	4254
Apprch %	5.7	11.7	82.5		6	90.2	3.8		40.8	21.4	37.8		22.5	73.6	4		
Total %	0.8	1.7	11.9	14.4	1.9	28.5	1.2	31.5	2.9	1.5	2.7	7	10.6	34.6	1.9	47	

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:30 PM																	
12:30 PM	**7**	10	**81**	**98**	11	166	4	181	**11**	8	18	37	**59**	178	11	248	564
12:45 PM	4	**11**	58	73	7	**173**	6	**186**	**23**	**16**	**21**	**60**	59	198	12	269	**588**
01:00 PM	6	10	67	83	6	144	**9**	159	17	6	14	37	52	194	**15**	261	540
01:15 PM	4	3	58	65	**12**	150	3	165	12	9	16	37	59	**233**	11	**303**	570
Total Volume	21	34	264	319	36	633	22	691	63	39	69	171	229	803	49	1081	2262
% App. Total	6.6	10.7	82.8		5.2	91.6	3.2		36.8	22.8	40.4		21.2	74.3	4.5		
PHF	.750	.773	.815	.814	.750	.915	.611	.929	.685	.609	.821	.713	.970	.862	.817	.892	.962

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield&BigBearBlvd Comb Sun
Site Code : 3
Start Date : 3/4/2007
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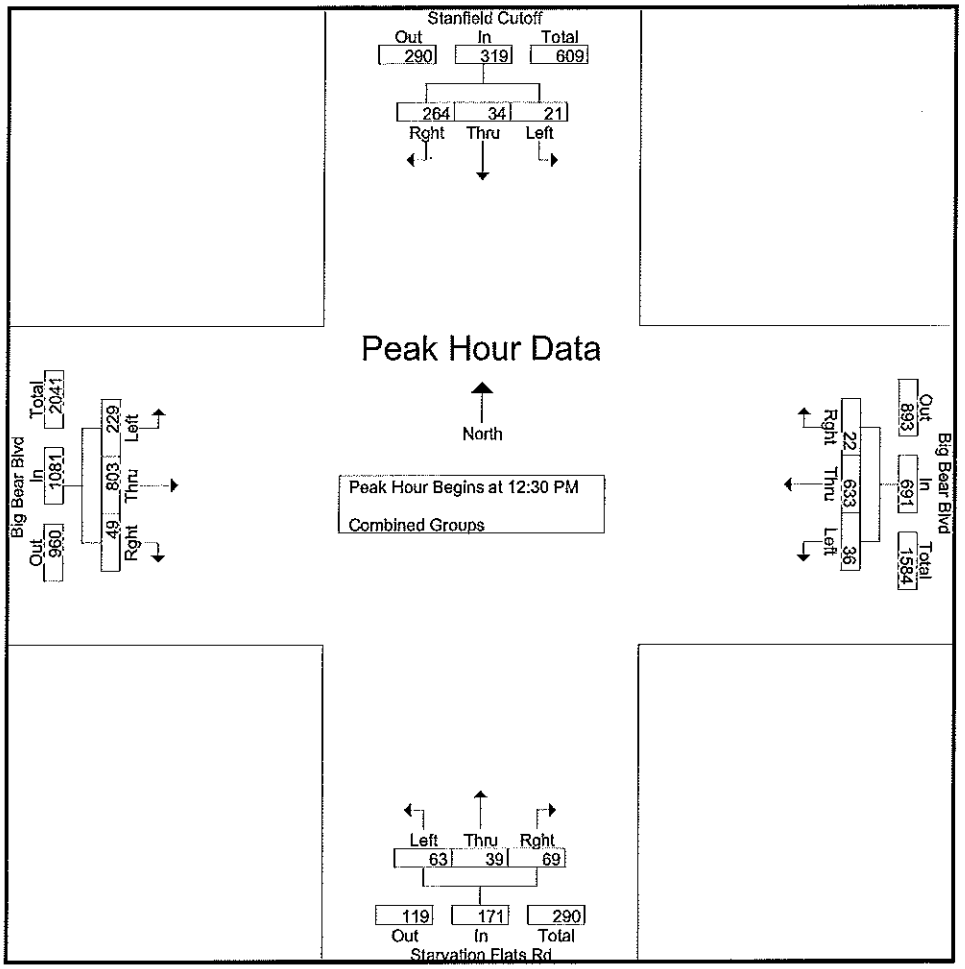

Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	12:15 PM				12:00 PM				12:30 PM				01:00 PM			
+0 mins.	3	**15**	**99**	**117**	**17**	156	**7**	180	11	8	18	37	52	194	**15**	261
+15 mins.	**7**	10	81	98	2	149	6	157	**23**	**16**	**21**	**60**	59	**233**	11	**303**
+30 mins.	4	11	58	73	11	166	4	181	17	6	14	37	**81**	183	4	268
+45 mins.	6	10	67	83	7	**173**	6	**186**	12	9	16	37	67	197	6	270
Total Volume	20	46	305	371	37	644	23	704	63	39	69	171	259	807	36	1102
% App. Total	5.4	12.4	82.2		5.3	91.5	3.3		36.8	22.8	40.4		23.5	73.2	3.3	
PHF	.714	.767	.770	.793	.544	.931	.821	.946	.685	.609	.821	.713	.799	.866	.600	.909

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Sunday
Site Code : 3
Start Date : 3/4/2007
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Groups Printed- Passenger Vehicles

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	1	4	53	58	17	156	7	180	17	9	7	33	51	182	12	245	516
12:15 PM	3	15	99	117	2	149	6	157	9	4	9	22	22	102	8	132	428
12:30 PM	7	10	81	98	11	166	4	181	11	8	18	37	59	175	11	245	561
12:45 PM	4	11	57	72	6	171	6	183	23	16	21	60	58	198	12	268	583
Total	15	40	290	345	36	642	23	701	60	37	55	152	190	657	43	890	2088
01:00 PM	6	10	66	82	6	144	9	159	17	5	14	36	52	191	15	258	535
01:15 PM	4	3	58	65	12	148	3	163	12	8	16	36	59	232	11	302	566
01:30 PM	5	8	47	60	13	132	10	155	15	3	12	30	80	183	4	267	512
01:45 PM	5	10	42	57	12	139	6	157	18	9	16	43	67	197	6	270	527
Total	20	31	213	264	43	563	28	634	62	25	58	145	258	803	36	1097	2140
Grand Total	35	71	503	609	79	1205	51	1335	122	62	113	297	448	1460	79	1987	4228
Apprch %	5.7	11.7	82.6		5.9	90.3	3.8		41.1	20.9	38		22.5	73.5	4		
Total %	0.8	1.7	11.9	14.4	1.9	28.5	1.2	31.6	2.9	1.5	2.7	7	10.6	34.5	1.9	47	

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:30 PM																	
12:30 PM	**7**	10	**81**	**98**	11	166	4	181	11	8	18	37	**59**	175	11	245	561
12:45 PM	4	**11**	57	72	6	**171**	6	**183**	**23**	**16**	**21**	**60**	58	198	12	268	**583**
01:00 PM	6	10	66	82	6	144	**9**	159	17	5	14	36	52	191	**15**	258	535
01:15 PM	4	3	58	65	**12**	148	3	163	12	8	16	36	59	**232**	11	**302**	566
Total Volume	21	34	262	317	35	629	22	686	63	37	69	169	228	796	49	1073	2245
% App. Total	6.6	10.7	82.6		5.1	91.7	3.2		37.3	21.9	40.8		21.2	74.2	4.6		
PHF	.750	.773	.809	.809	.729	.920	.611	.937	.685	.578	.821	.704	.966	.858	.817	.888	.963

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Sunday
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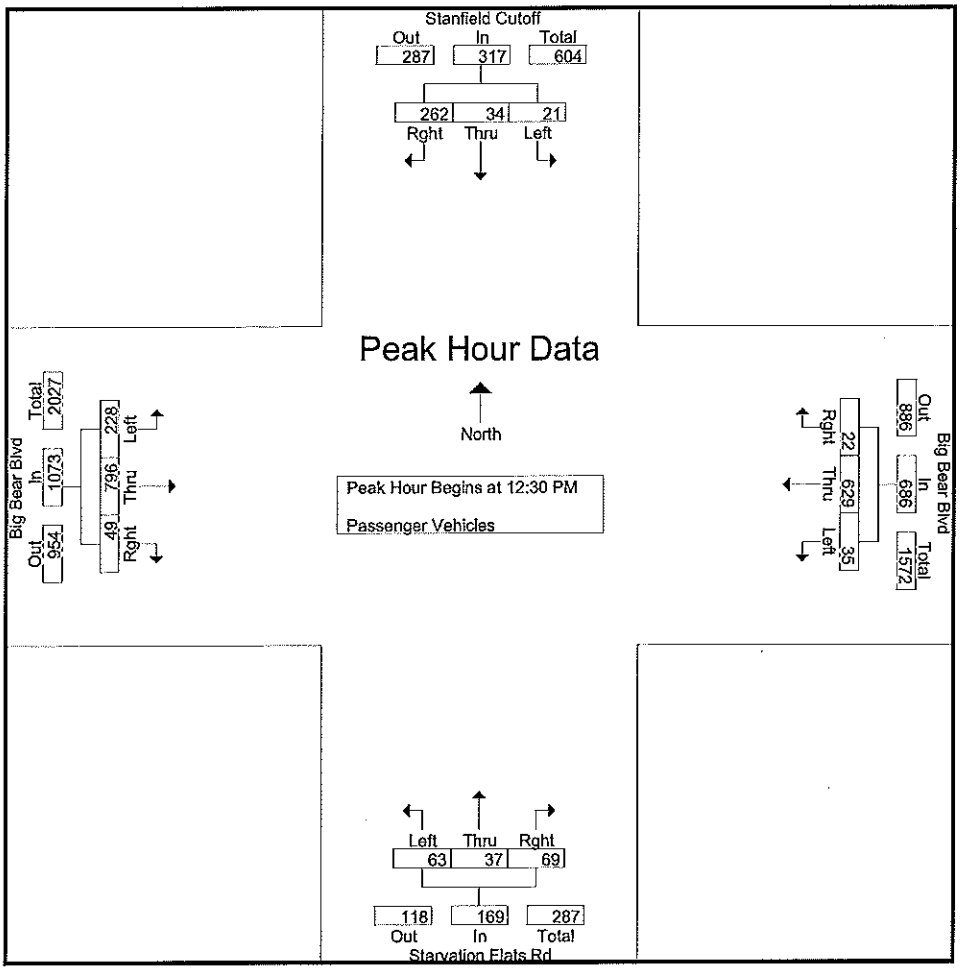

Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	12:15 PM				12:00 PM				12:30 PM				01:00 PM			
+0 mins.	3	**15**	**99**	**117**	**17**	156	**7**	180	11	8	18	37	52	191	**15**	258
+15 mins.	**7**	10	81	98	2	149	6	157	**23**	**16**	**21**	**60**	59	**232**	11	**302**
+30 mins.	4	11	57	72	11	166	4	181	17	5	14	36	**80**	183	4	267
+45 mins.	6	10	66	82	6	**171**	6	**183**	12	8	16	36	67	197	6	270
Total Volume	20	46	303	369	36	642	23	701	63	37	69	169	258	803	36	1097
% App. Total	5.4	12.5	82.1		5.1	91.6	3.3		37.3	21.9	40.8		23.5	73.2	3.3	
PHF	.714	.767	.765	.788	.529	.939	.821	.958	.685	.578	.821	.704	.806	.865	.600	.908

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Sunday
Site Code : 3
Start Date : 3/4/2007
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Groups Printed- Large 2 Axle

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
12:45 PM	0	0	1	1	1	2	0	3	0	0	0	0	1	0	0	1	5
Total	0	0	1	1	1	2	0	3	0	0	0	0	1	7	0	8	12
01:00 PM	0	0	1	1	0	0	0	0	0	1	0	1	0	3	0	3	5
01:15 PM	0	0	0	0	0	2	0	2	0	1	0	1	0	1	0	1	4
01:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	1	2
01:45 PM	0	1	1	2	0	1	0	1	0	0	0	0	0	0	0	0	3
Total	0	1	2	3	0	4	0	4	0	2	0	2	1	4	0	5	14
Grand Total	0	1	3	4	1	6	0	7	0	2	0	2	2	11	0	13	26
Apprch %	0	25	75		14.3	85.7	0		0	100	0		15.4	84.6	0		
Total %	0	3.8	11.5	15.4	3.8	23.1	0	26.9	0	7.7	0	7.7	7.7	42.3	0	50	

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:30 PM																	
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	0	**3**	3
12:45 PM	0	0	**1**	**1**	**1**	**2**	0	**3**	0	0	0	0	**1**	0	0	1	**5**
01:00 PM	0	0	1	1	**0**	0	0	0	0	**1**	0	**1**	0	3	0	3	5
01:15 PM	0	0	0	0	0	2	0	2	0	1	0	1	0	1	0	1	4
Total Volume	0	0	2	2	**1**	4	0	5	0	2	0	2	1	7	0	8	17
% App. Total	0	0	100		20	80	0		0	100	0		12.5	87.5	0		
PHF	.000	.000	.500	.500	.250	.500	.000	.417	.000	.500	.000	.500	.250	.583	.000	.667	.850

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Sunday
Site Code : 3
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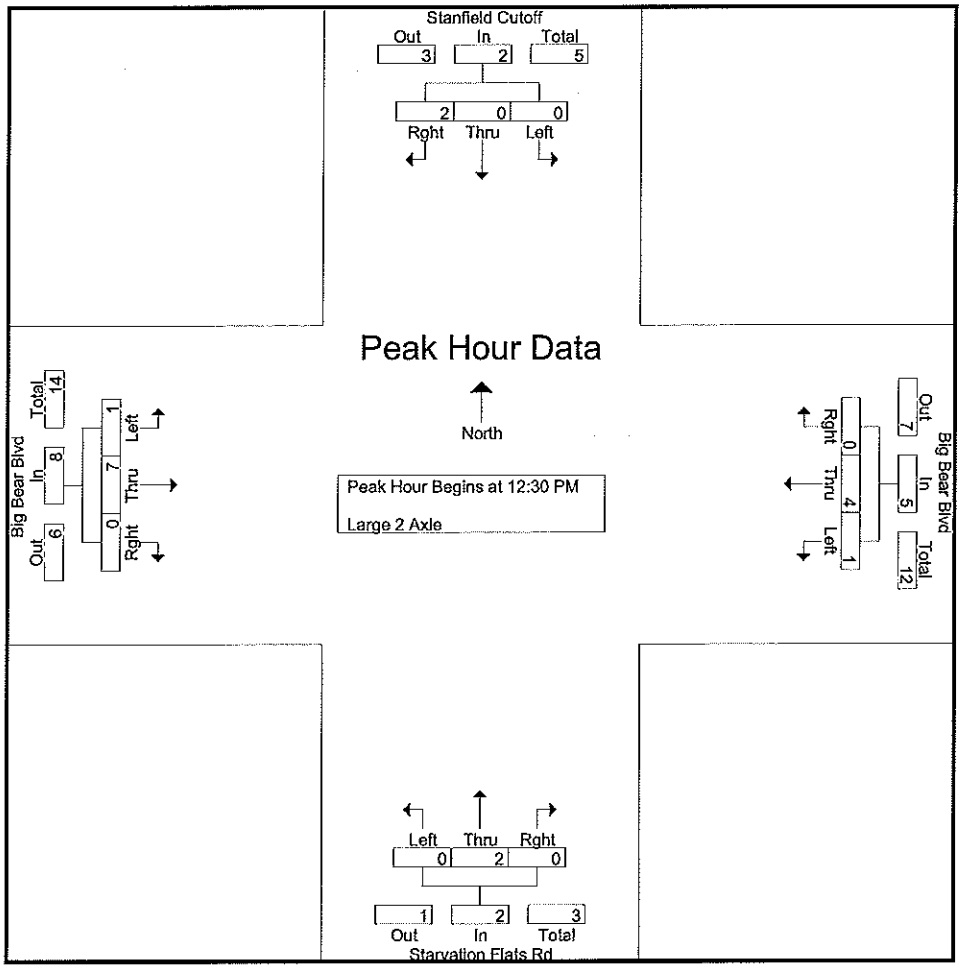

Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	01:00 PM				12:45 PM				12:30 PM				12:15 PM			
+0 mins.	0	0	**1**	1	**1**	**2**	0	**3**	0	0	0	0	0	2	0	2
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	0	**3**
+30 mins.	0	0	0	0	0	2	0	2	0	**1**	0	**1**	**1**	0	0	1
+45 mins.	0	**1**	1	**2**	0	1	0	1	0	1	0	1	0	3	0	3
Total Volume	0	1	2	3	1	5	0	6	0	2	0	2	1	8	0	9
% App. Total	0	33.3	66.7		16.7	83.3	0		0	100	0		11.1	88.9	0	
PHF	.000	.250	.500	.375	.250	.625	.000	.500	.000	.500	.000	.500	.250	.667	.000	.750

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Sunday
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Page No : 1

Groups Printed- 3 Axle

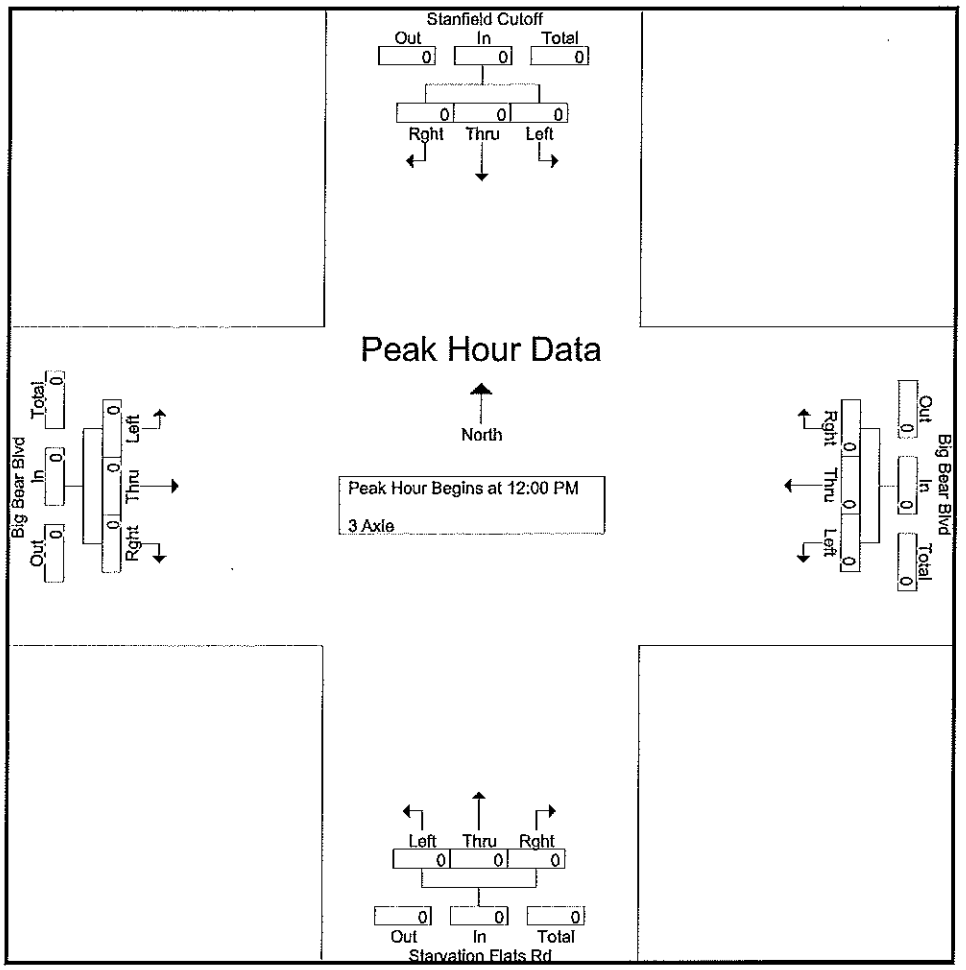
	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

	Stanfield Cutoff Southbound				Big Bear Blvd Westbound				Starvation Flats Rd Northbound				Big Bear Blvd Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of: Big Bear
N/S: Stanfield Cutoff
E/W: Big Bear Blvd

Traffic Data Consultants

File Name : Stanfield@BigBearBlvd Sunday
Site Code : 3
Start Date : 3/4/2007
Page No : 2



Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				12:00 PM				12:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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APPENDIX B

EXISTING CONDITIONS INTERSECTION ANALYSIS

MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 0409)
Existing Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

Average Delay (sec/veh): 15.4 Worst Case Level Of Service: C[16.5]

Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	1!	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0
Volume Module:																				
Base Vol:	24	0	27			0	0	0			0	0	322		21	87		300		0
Growth Adj:	1.16	1.16	1.16			1.16	1.16	1.16			1.16	1.16	1.16		1.16	1.16		1.16		1.16
Initial Bse:	28	0	31			0	0	0			0	0	374		24	101		348		0
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.00		1.00
PHF Adj:	0.84	0.84	0.84			0.84	0.84	0.84			0.84	0.84	0.84		0.84	0.84		0.84		0.84
PHF Volume:	33	0	37			0	0	0			0	0	447		29	121		416		0
Reduct Vol:	0	0	0			0	0	0			0	0	0		0	0		0		0
FinalVolume:	33	0	37			0	0	0			0	0	447		29	121		416		0
Critical Gap Module:																				
Critical Gp:	4.1	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxxx	6.5		6.2	7.1		6.5		xxxxx
FollowUpTim:	2.2	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxxx	4.0		3.3	3.5		4.0		xxxxx
Capacity Module:																				
Cnflict Vol:	0	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	104		0	309		85		xxxxx
Potent Cap.:	900	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	790		900	648		809		xxxxx
Move Cap.:	900	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	760		900	325		778		xxxxx
Volume/Cap:	0.04	xxxx	xxxx			xxxx	xxxx	xxxx			xxxx	xxxx	0.59		0.03	0.37		0.53		xxxx
Level Of Service Module:																				
2Way95thQ:	0.1	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	3.9		0.1	1.7		3.2		xxxxx
Control Del:	9.2	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxxx	16.3		9.1	22.5		14.8		xxxxx
LOS by Move:	A	*	*			*	*	*			*	*	C		A	C		B		*
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx		
SharedQueue:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
Shrd ConDel:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
Shared LOS:	*	*	*			*	*	*			*	*	*			*	*	*		
ApproachDel:	xxxxxx					xxxxxx					15.8					16.5				
ApproachLOS:	*					*					C					C				

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 0409)
Existing Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

Average Delay (sec/veh): 11.4 Worst Case Level Of Service: D[25.5]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 1 0 0 0			0 0 0 1 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	58	5	208	5	10	0	0	74	70	218	54	6
Growth Adj:	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Initial Bse:	67	6	241	6	12	0	0	86	81	253	63	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	75	6	269	6	13	0	0	96	91	282	70	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	75	6	269	6	13	0	0	96	91	282	70	8
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	785	782	141	916	824	xxxxx	xxxx	xxxx	xxxxx	186	xxxx	xxxxx
Potent Cap.:	313	328	912	255	310	xxxxx	xxxx	xxxx	xxxxx	1400	xxxx	xxxxx
Move Cap.:	245	250	912	144	236	xxxxx	xxxx	xxxx	xxxxx	1400	xxxx	xxxxx
Volume/Cap:	0.31	0.03	0.29	0.04	0.05	xxxx	xxxx	xxxx	xxxx	0.20	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.8	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.2	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	559	xxxxx	195	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	4.3	xxxxx	0.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	21.6	xxxxx	25.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	C	*	D	*	*	*	*	*	*	*	*
ApproachDel:	21.6			25.5			xxxxxx			xxxxxx		
ApproachLOS:	C			D			*			*		

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 0409)
Existing Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	130	Critical Vol./Cap.(X):	0.719
Loss Time (sec):	8 (Y+R=2.0 sec)	Average Delay (sec/veh):	106.5
Optimal Cycle:	84	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	0 1	0	0 1	0 1	0	0 1	1 0	1	0 1	1 0	1	0 1
Volume Module:												
Base Vol:	61	18	61	12	28	256	287	872	77	17	664	13
Growth Adj:	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Initial Bse:	71	21	71	14	32	297	333	1012	89	20	770	15
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	73	22	73	14	34	307	344	1045	92	20	796	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	73	22	73	14	34	307	344	1045	92	20	796	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	73	22	73	14	34	307	344	1045	92	20	796	16
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	0.78	0.22	1.00	0.31	0.69	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1329	392	1800	531	1238	1800	1700	1800	1800	1700	1800	1800
Capacity Analysis Module:												
Vol/Sat:	0.05	0.05	0.04	0.03	0.03	0.17	0.20	0.58	0.05	0.01	0.44	0.01
Crit Moves:		****			****			****		****		
Green/Cycle:	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.49	0.49	0.08	0.39	0.39
Volume/Cap:	0.30	0.30	0.22	0.15	0.15	0.92	1.13	1.18	0.10	0.16	1.13	0.02
Delay/Veh:	48.1	48.1	46.6	45.4	45.4	85.3	145.5	118	14.0	58.6	112	22.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	48.1	48.1	46.6	45.4	45.4	85.3	145.5	118	14.0	58.6	112	22.1
LOS by Move:	D	D	D	D	D	F	F	F	B	E	F	C
HCM2kAvgQ:	3	3	2	2	2	16	23	63	1	1	46	0

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 0409)
Existing Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

Average Delay (sec/veh): OVERFLOW Worst Case Level Of Service: F[xxxxx]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1!	0	0	0 0 0	0	0	0 0 1	0	1	1 0 1	0	0
Volume Module:												
Base Vol:	40	0	94	0	0	0	0	958	33	67	411	0
Growth Adj:	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Initial Bse:	46	0	109	0	0	0	0	1111	38	78	477	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	51	0	120	0	0	0	0	1219	42	85	523	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	51	0	120	0	0	0	0	1219	42	85	523	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	6.5	6.2	7.1	6.5	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.0	3.3	3.5	4.0	xxxxx
Capacity Module:												
Cnflict Vol:	0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	221	0	771	162	xxxxx
Potent Cap.:	900	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	681	900	320	734	xxxxx
Move Cap.:	900	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	641	900	0	692	xxxxx
Volume/Cap:	0.06	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	1.90	0.05	xxxx	0.76	xxxx
Level Of Service Module:												
2Way95thQ:	0.2	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	78.0	0.1	xxxx	7.0	xxxxx
Control Del:	9.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	427	9.2	xxxxx	24.5	xxxxx
LOS by Move:	A	*	*	*	*	*	*	F	A	*	C	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			413.4			xxxxxx		
ApproachLOS:	*			*			F			F		

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 0409)
Existing Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

Average Delay (sec/veh): 15.2 Worst Case Level Of Service: D[34.5]

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Stop Sign						Stop Sign						Uncontrolled						Uncontrolled					
Rights:	Include						Include						Include						Include					
Lanes:	0	0	1!	0	0		0	0	1!	0	0		0	0	1!	0	0		0	0	1!	0	0	
Volume Module:																								
Base Vol:	110		4		174		8		6		6		4		80		120		177		84		6	
Growth Adj:	1.16	1.16		1.16		1.16		1.16		1.16		1.16		1.16		1.16		1.16		1.16		1.16		1.16
Initial Bse:	128		5		202		9		7		7		5		93		139		205		97		7	
User Adj:	1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
PHF Adj:	0.92	0.92		0.92		0.92		0.92		0.92		0.92		0.92		0.92		0.92		0.92		0.92		0.92
PHF Volume:	138		5		219		10		8		8		5		101		151		222		106		8	
Reduct Vol:	0		0		0		0		0		0		0		0		0		0		0		0	
FinalVolume:	138		5		219		10		8		8		5		101		151		222		106		8	
Critical Gap Module:																								
Critical Gp:	7.1	6.5		6.2		7.1		6.5		6.2		4.1	xxxx		xxxxx		4.1	xxxx		xxxxx				
FollowUpTim:	3.5	4.0		3.3		3.5		4.0		3.3		2.2	xxxx		xxxxx		2.2	xxxx		xxxxx				
Capacity Module:																								
Cnflict Vol:	748		744		176		852		816		109		113	xxxx		xxxxx		251	xxxx		xxxxx			
Potent Cap.:	331		345		872		282		314		950		1489	xxxx		xxxxx		1326	xxxx		xxxxx			
Move Cap.:	273		278		872		177		253		950		1489	xxxx		xxxxx		1326	xxxx		xxxxx			
Volume/Cap:	0.51	0.02		0.25		0.06		0.03		0.01		0.00	xxxx		xxxx		0.17	xxxx		xxxx				
Level Of Service Module:																								
2Way95thQ:	xxxx		xxxx		xxxxx		xxxx		xxxx		xxxxx		0.0	xxxx		xxxxx		0.6	xxxx		xxxxx			
Control Del:	xxxxx		xxxx		xxxxx		xxxxx		xxxx		xxxxx		7.4	xxxx		xxxxx		8.3	xxxx		xxxxx			
LOS by Move:	*		*		*		*		*		*		A		*		*		A		*		*	
Movement:	LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT	
Shared Cap.:	xxxx		467	xxxxx			xxxx		266	xxxxx			xxxx	xxxx		xxxxx			xxxx	xxxx		xxxxx		
SharedQueue:	xxxxx		6.8	xxxxx			xxxxx		0.3	xxxxx			xxxxx	xxxx		xxxxx			xxxxx	xxxx		xxxxx		
Shrd ConDel:	xxxxx		34.5	xxxxx			xxxxx		19.9	xxxxx			xxxxx	xxxx		xxxxx			xxxxx	xxxx		xxxxx		
Shared LOS:	*		D	*			*		C	*			*	*		*			*	*		*		
ApproachDel:			34.5						19.9					xxxxxx						xxxxxx				
ApproachLOS:			D						C					*						*				

Note: Queue reported is the number of cars per lane.

Traffix 7.8.0115 (c) 2007 Dowling Assoc. Licensed to URBAN CROSSROADS, IRVINE

MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 0409)
Existing Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	130	Critical Vol./Cap.(X):	0.720
Loss Time (sec):	8 (Y+R=2.0 sec)	Average Delay (sec/veh):	81.1
Optimal Cycle:	84	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	0 1	0 0	1	0 1	0 0	1	1 0	1 0	1	1 0	1 0	1
Volume Module:												
Base Vol:	63	40	69	21	34	265	230	807	49	37	635	22
Growth Adj:	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Initial Bse:	73	46	80	24	39	307	267	936	57	43	737	26
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	76	48	83	25	41	320	277	973	59	45	766	27
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	76	48	83	25	41	320	277	973	59	45	766	27
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	76	48	83	25	41	320	277	973	59	45	766	27
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	0.63	0.37	1.00	0.40	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1063	675	1800	672	1088	1800	1700	1800	1800	1700	1800	1800
Capacity Analysis Module:												
Vol/Sat:	0.07	0.07	0.05	0.04	0.04	0.18	0.16	0.54	0.03	0.03	0.43	0.01
Crit Moves:		****		****				****		****		
Green/Cycle:	0.18	0.18	0.18	0.18	0.18	0.18	0.16	0.49	0.49	0.08	0.41	0.41
Volume/Cap:	0.39	0.39	0.25	0.20	0.20	0.96	1.03	1.10	0.07	0.34	1.03	0.04
Delay/Veh:	50.0	50.0	47.1	46.3	46.3	93.1	118.8	86.4	13.6	63.8	75.9	20.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	50.0	50.0	47.1	46.3	46.3	93.1	118.8	86.4	13.6	63.8	75.9	20.2
LOS by Move:	D	D	D	D	D	F	F	F	B	E	E	C
HCM2kAvgQ:	4	4	3	2	2	17	17	53	1	2	39	0

Note: Queue reported is the number of cars per lane.

Traffix 7.8.0115 (c) 2007 Dowling Assoc. Licensed to URBAN CROSSROADS, IRVINE

APPENDIX C

TRAFFIC SIGNAL WARRANTS

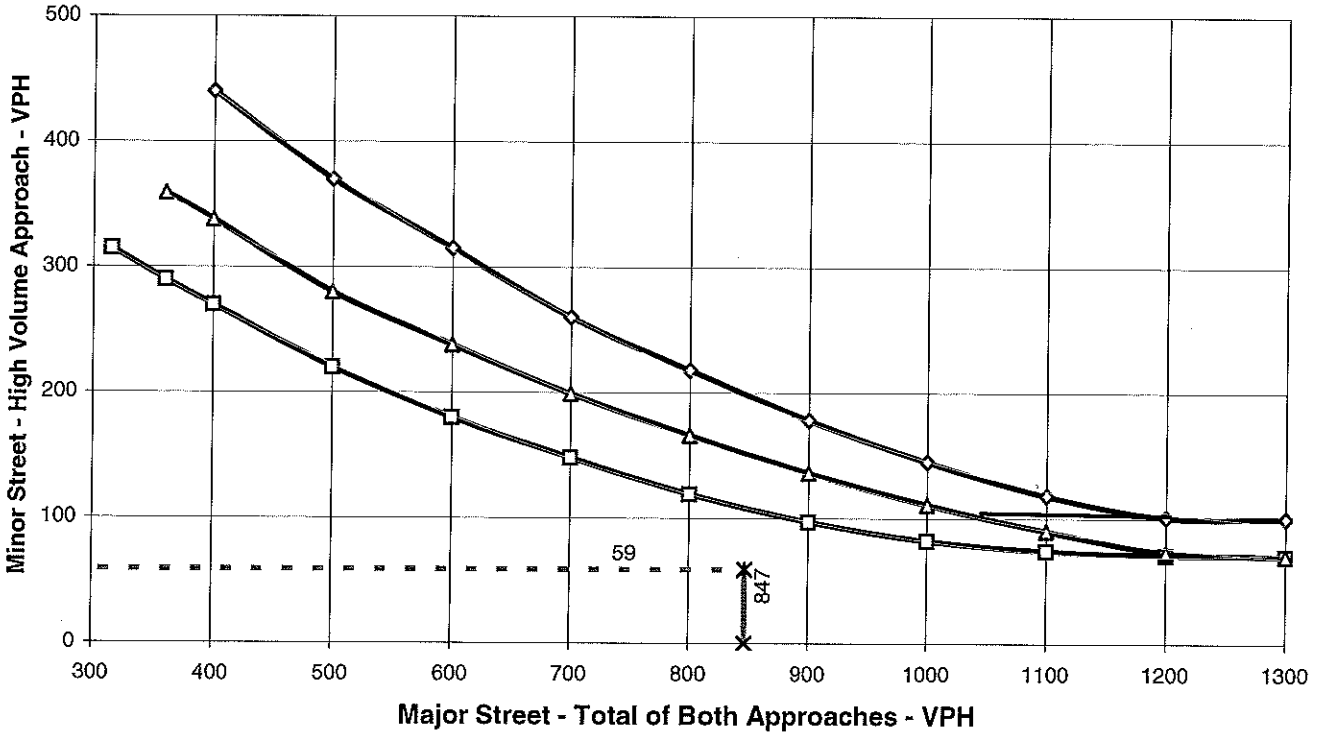
PEAK HOUR VOLUME WARRANT
(Rural Areas)

FRIDAY PM PEAK HOUR CONDITIONS (EXISTING CONDITIONS)

Major Street Name = **NORTH SHORE (EW)** Total of Both Approaches (VPH) = **847**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **BIGBEAR (NS)** High Volume Approach (VPH) = **59**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



1 Lane (Major) & 1 Lane (Minor)
2+ Lanes (Major) & 1 Lane (Minor) OR 1 Lane (Major) & 2+ Lanes (Minor)
2+ Lanes (Major) & 2+ Lanes (Minor)
Major Street Approaches
Minor Street Approaches

** NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

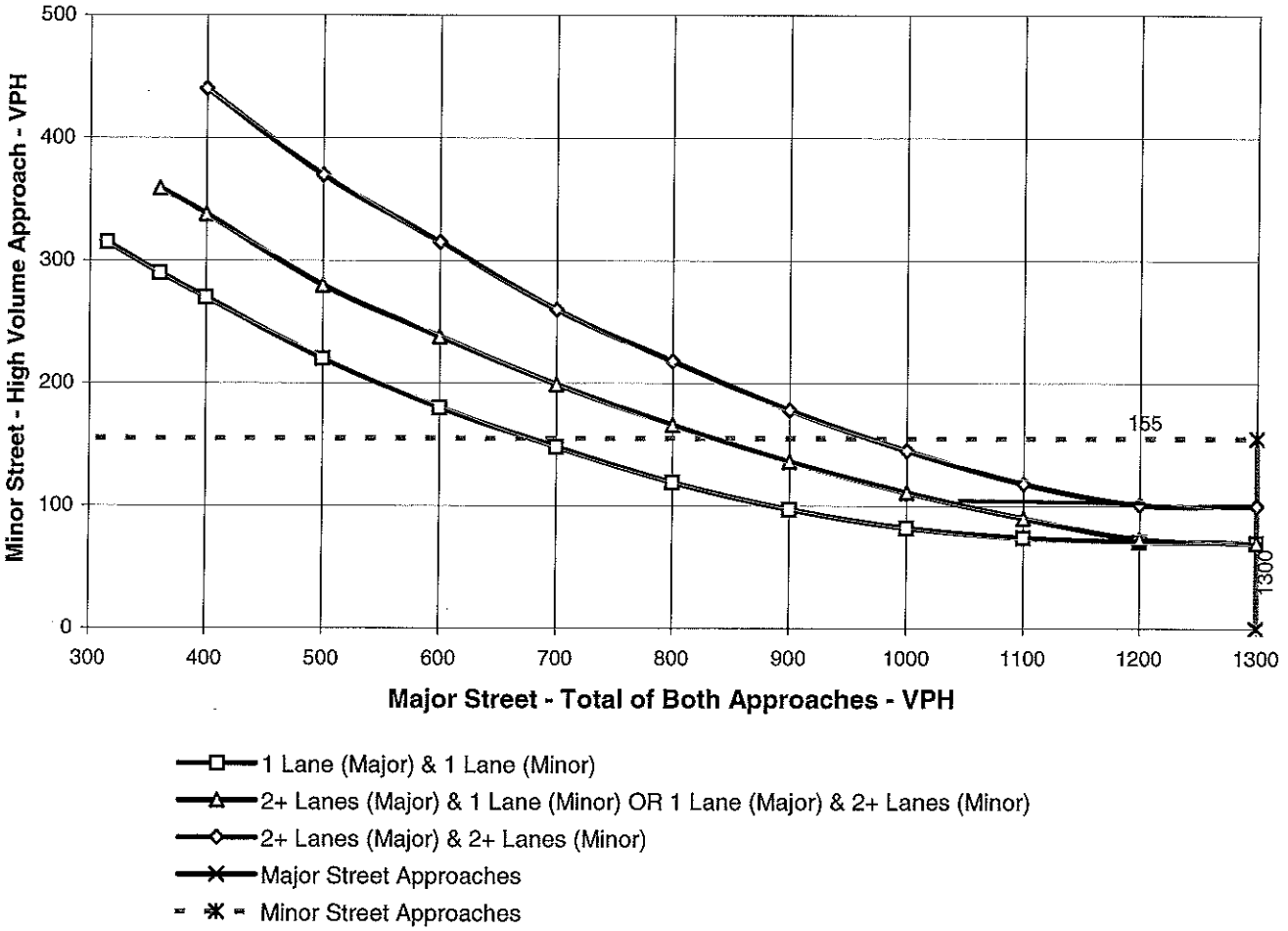
PEAK HOUR VOLUME WARRANT
(Rural Areas)

SUNDAY MIDDAY PEAK HOUR CONDITIONS (EXISTING CONDITIONS)

Major Street Name = **NORTH SHORE (EW)** Total of Both Approaches (VPH) = **1704**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **BIGBEAR (NS)** High Volume Approach (VPH) = **155**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



** NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

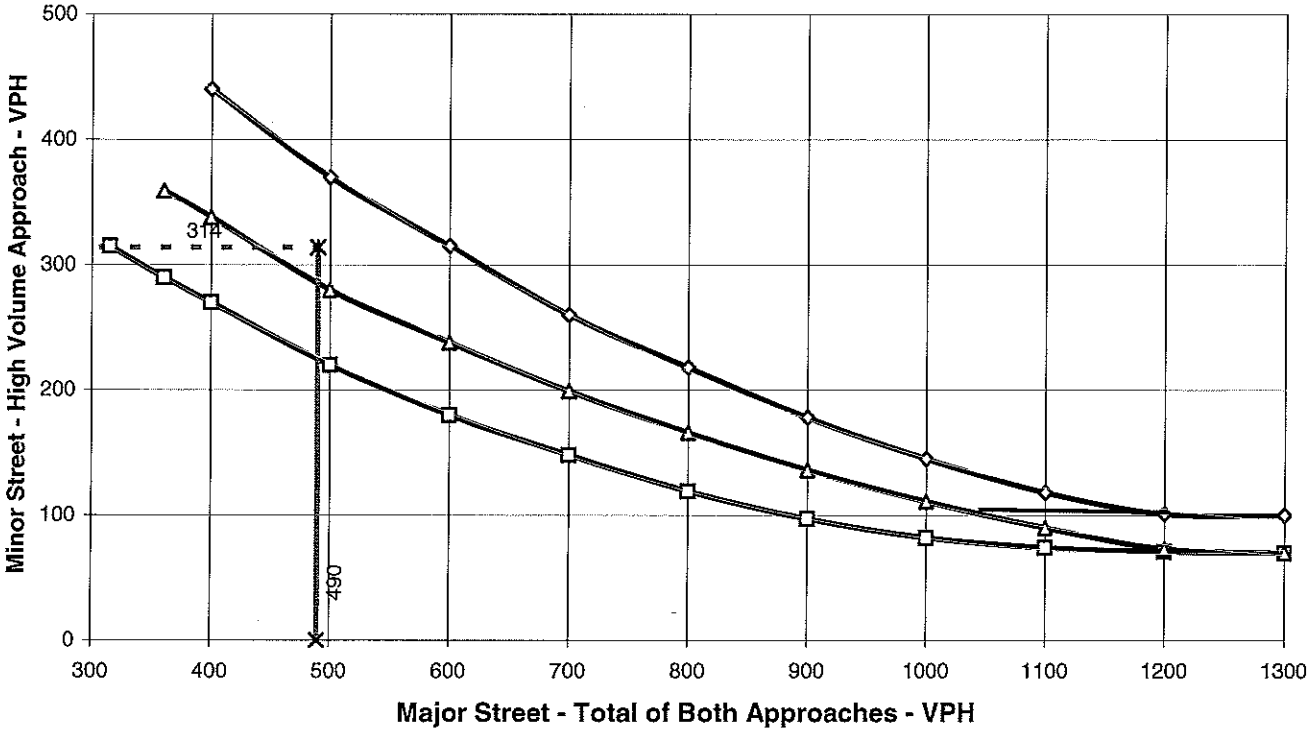
PEAK HOUR VOLUME WARRANT
(Rural Areas)

FRIDAY PM PEAK HOUR CONDITIONS (EXISTING CONDITIONS)

Major Street Name = **NORTH SHORE (EW)** Total of Both Approaches (VPH) = **490**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **STANFIELD CUT OFF (NS)** High Volume Approach (VPH) = **314**
Number of Approach Lanes Minor Street = **1**

WARRANTED FOR A SIGNAL



** NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

TRAFFIC SIGNAL WARRANTS

(Based on Estimated Average Daily Traffic-See Note 2)

Major St: DWY 1 Minor St: North Shore Year = GP FRI
Volume = 20,000 Lanes= 1 Volume = 200 Lanes= 1 (one-way)

URBAN RURAL XX	Minimum Requirements EADT	
1. Minimum Vehicular Satisfied Not Satisfied XX	Vehicles per day on major street (both approaches)	Vehicles per day on higher volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach. Major Street 20,000 Minor Street 200 1 1 2 + 1 2 + 2 + 1 2 +	Urban Rural 8,000 5,600 * 9,600 6,720 9,600 6,720 8,000 5,600	Urban Rural 2,400 1,680 2,400 1,680 3,200 2,240 3,200 2,240
2. Interruption of Continuous traffic Satisfied Not Satisfied XX	Vehicles per day on major street (both approaches)	Vehicles per day on higher volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach. Major Street 20,000 Minor Street 200 1 1 2 + 1 2 + 2 + 1 2 +	Urban Rural 12,000 8,400 * 14,400 10,080 14,000 10,080 12,000 8,400	Urban Rural 1,200 850 1,200 850 1,600 1,120 1,600 1,120
3. Combination Satisfied Not Satisfied XX No one warrant satisfied but following warrants fulfilled 80% or more.. 12% 24% 1 2	2 Warrants	2 Warrants

NOTES: 1. Heavier left turn movement from the major street may be included with minor street volume if a separate signal phase is to be provided for the left-turn movement.

2. To be used only for NEW INTERSECTIONS or other locations where actual traffic volumes cannot be counted.

TRAFFIC SIGNAL WARRANTS

(Based on Estimated Average Daily Traffic-See Note 2)

Major St: DWY 2 Minor St: North Shore Year = GP FRI
Volume = 20,000 Lanes= 1 Volume = 400 Lanes= 1 (one-way)

URBAN RURAL XX	Minimum Requirements EADT	
1. Minimum Vehicular Satisfied Not Satisfied XX	Vehicles per day on major street (both approaches)	Vehicles per day on higher volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach. Major Street 20,000 Minor Street 400 1 1 2 + 1 2 + 2 + 1 2 +	Urban Rural 8,000 5,600 * 9,600 6,720 9,600 6,720 8,000 5,600	Urban Rural 2,400 1,680 2,400 1,680 3,200 2,240 3,200 2,240
2. Interruption of Continuous traffic Satisfied Not Satisfied XX	Vehicles per day on major street (both approaches)	Vehicles per day on higher volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach. Major Street 20,000 Minor Street 400 1 1 2 + 1 2 + 2 + 1 2 +	Urban Rural 12,000 8,400 * 14,400 10,080 14,000 10,080 12,000 8,400	Urban Rural 1,200 850 1,200 850 1,600 1,120 1,600 1,120
3. Combination Satisfied Not Satisfied XX No one warrant satisfied but following warrants fulfilled 80% or more.. 24% 47% 1 2	2 Warrants	2 Warrants

NOTES: 1. Heavier left turn movement from the major street may be included with minor street volume if a separate signal phase is to be provided for the left-turn movement.
2. To be used only for NEW INTERSECTIONS or other locations where actual traffic volumes cannot be counted.

TRAFFIC SIGNAL WARRANTS

(Based on Estimated Average Daily Traffic-See Note 2)

Major St: DWY 1 Minor St: North Shore Year = GP Buildou
Volume = 15,000 Lanes= 1 Volume = 200 Lanes= 1 (one-way)

URBAN RURAL XX	Minimum Requirements EADT	
1. Minimum Vehicular Satisfied Not Satisfied XX	Vehicles per day on major street (both approaches)	Vehicles per day on higher volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach. Major Street 15,000 Minor Street 200 1 1 2 + 1 2 + 2 + 1 2 +	Urban Rural 8,000 5,600 * 9,600 6,720 9,600 6,720 8,000 5,600	Urban Rural 2,400 1,680 2,400 1,680 3,200 2,240 3,200 2,240
2. Interruption of Continuous traffic Satisfied Not Satisfied XX	Vehicles per day on major street (both approaches)	Vehicles per day on higher volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach. Major Street 15,000 Minor Street 200 1 1 2 + 1 2 + 2 + 1 2 +	Urban Rural 12,000 8,400 * 14,400 10,080 14,000 10,080 12,000 8,400	Urban Rural 1,200 850 1,200 850 1,600 1,120 1,600 1,120
3. Combination Satisfied Not Satisfied XX No one warrant satisfied but following warrants fulfilled 80% or more.. 12% 24% 1 2	2 Warrants	2 Warrants

NOTES: 1. Heavier left turn movement from the major street may be included with minor street volume if a separate signal phase is to be provided for the left-turn movement.

2. To be used only for NEW INTERSECTIONS or other locations where actual traffic volumes cannot be counted.

TRAFFIC SIGNAL WARRANTS

(Based on Estimated Average Daily Traffic-See Note 2)

Major St: DWY 2 Minor St: North Shore Year = GP Buildo
Volume = 15,000 Lanes= 1 Volume = 400 Lanes= 1 (one-way)

URBAN RURAL XX	Minimum Requirements EADT	
1. Minimum Vehicular Satisfied Not Satisfied XX	Vehicles per day on major street (both approaches)	Vehicles per day on higher volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach. Major Street 15,000 Minor Street 400 1 1 2 + 1 2 + 2 + 1 2 +	Urban Rural 8,000 5,600 * 9,600 6,720 9,600 6,720 8,000 5,600	Urban Rural 2,400 1,680 2,400 1,680 3,200 2,240 3,200 2,240
2. Interruption of Continuous traffic Satisfied Not Satisfied XX	Vehicles per day on major street (both approaches)	Vehicles per day on higher volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach. Major Street 15,000 Minor Street 400 1 1 2 + 1 2 + 2 + 1 2 +	Urban Rural 12,000 8,400 * 14,400 10,080 14,000 10,080 12,000 8,400	Urban Rural 1,200 850 1,200 850 1,600 1,120 1,600 1,120
3. Combination Satisfied Not Satisfied XX No one warrant satisfied but following warrants fulfilled 80% or more.. 24% 47% 1 2	2 Warrants	2 Warrants

NOTES: 1. Heavier left turn movement from the major street may be included with minor street volume if a separate signal phase is to be provided for the left-turn movement.

2. To be used only for NEW INTERSECTIONS or other locations where actual traffic volumes cannot be counted.

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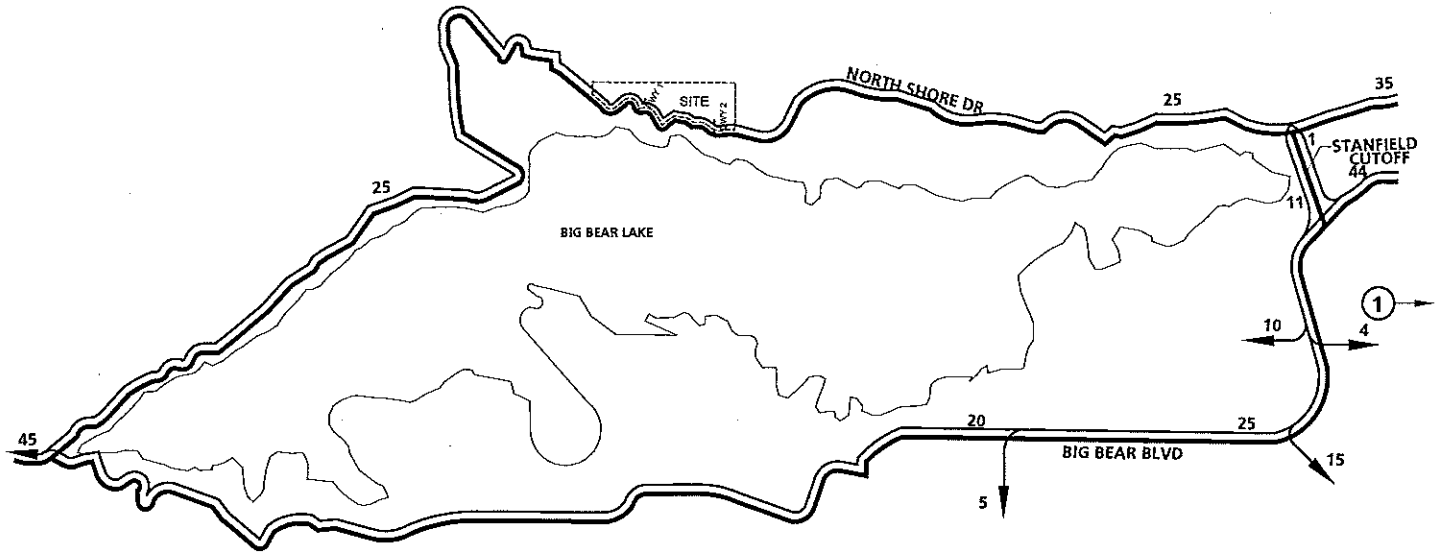
APPENDIX D

OTHER DEVELOPMENT TRIP DISTRIBUTION

EXHIBIT D-1

TT 16771
TRIP DISTRIBUTION



LEGEND:

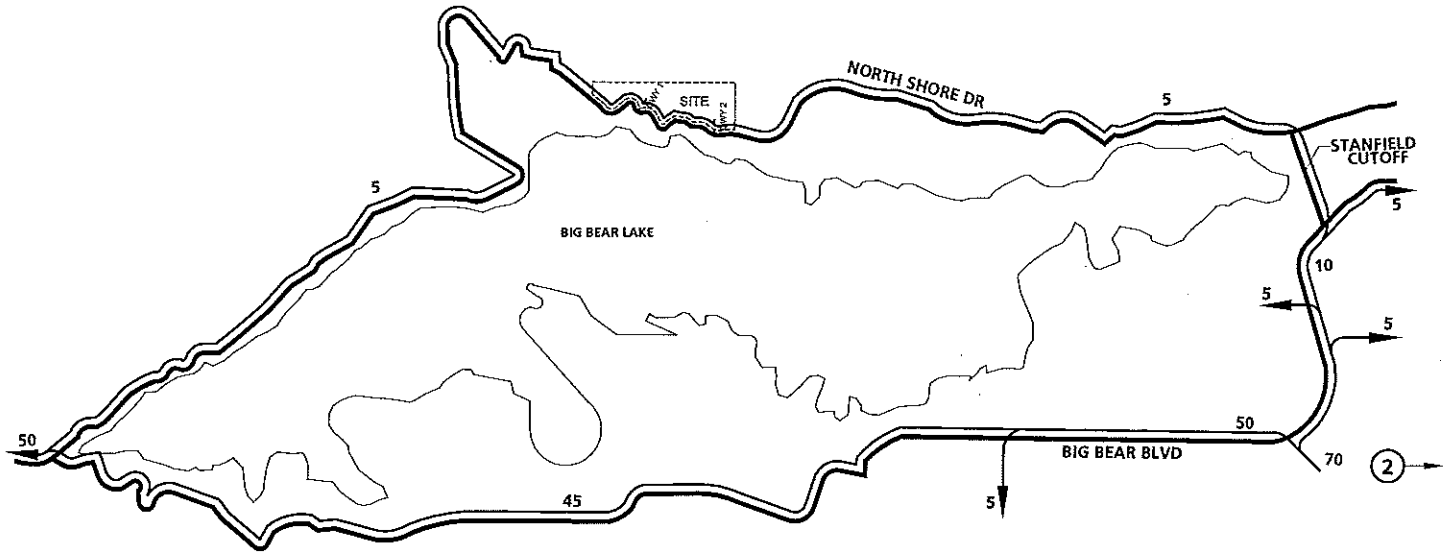
(1) = TT 16771

SOURCE: BASED ON TT16771 TIA,
SAN BERNARDINO COUNTY
(URBAN CROSSROADS, INC.), JULY 2006

N

EXHIBIT D-2

TT 16934
TRIP DISTRIBUTION



SOURCE: BASED TT 17217 & TT 17022 TIA
SAN BERNARDINO COUNTY
(URBAN CROSSROADS, INC.), JULY 2006

LEGEND:

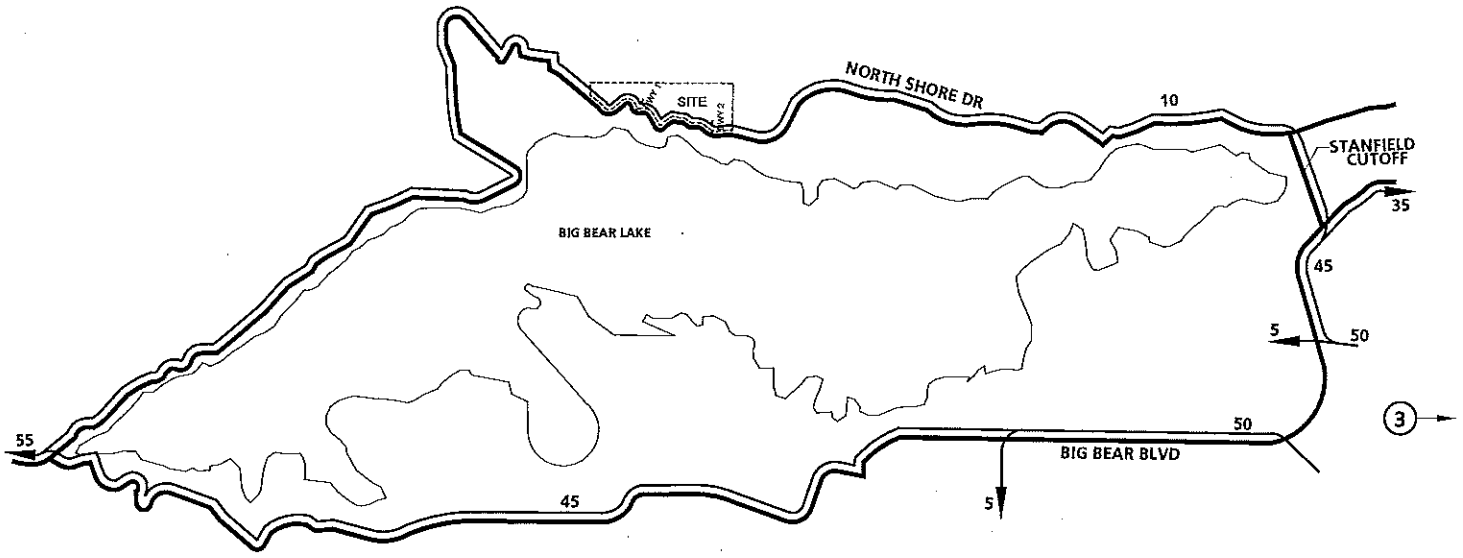
(2) = TT 16934

N

URBAN CROSSROADS

EXHIBIT D-3

TT 17217 & 17022
TRIP DISTRIBUTION



SOURCE: BASED TT 17217 & TT 17022 TIA
SAN BERNARDINO COUNTY
(URBAN CROSSROADS, INC.), JULY 2006

LEGEND:

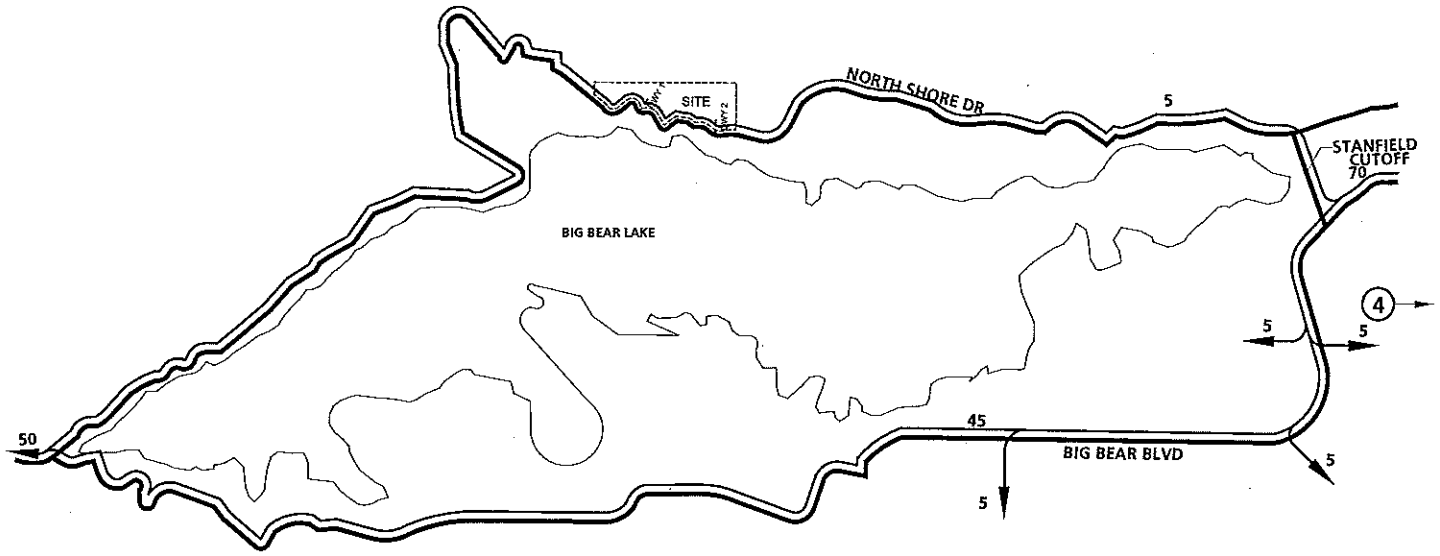
(3) = TT 17217 & 17022

N

URBAN CROSSROADS

EXHIBIT D-4

TT 16036
TRIP DISTRIBUTION



LEGEND:

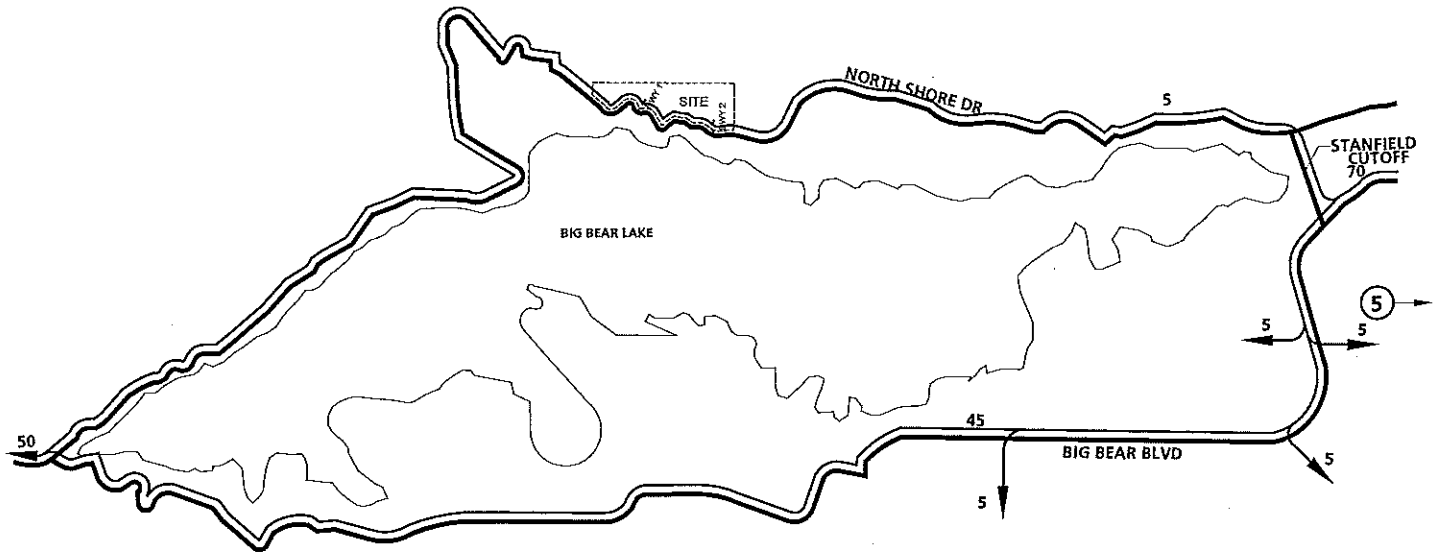
(4) = TT 16036

N

URBAN CROSSROADS

EXHIBIT D-5

TT 14916
TRIP DISTRIBUTION



LEGEND:

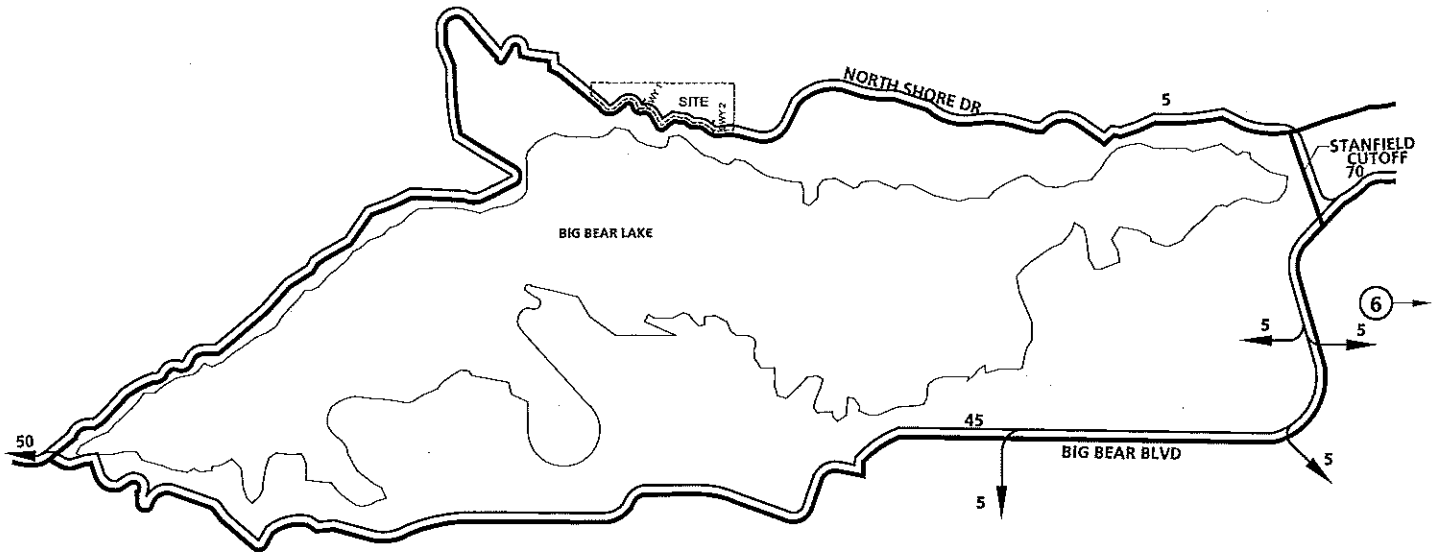
(5) = TT 14916

N

URBAN CROSSROADS

EXHIBIT D-6

TT 16980
TRIP DISTRIBUTION



LEGEND:

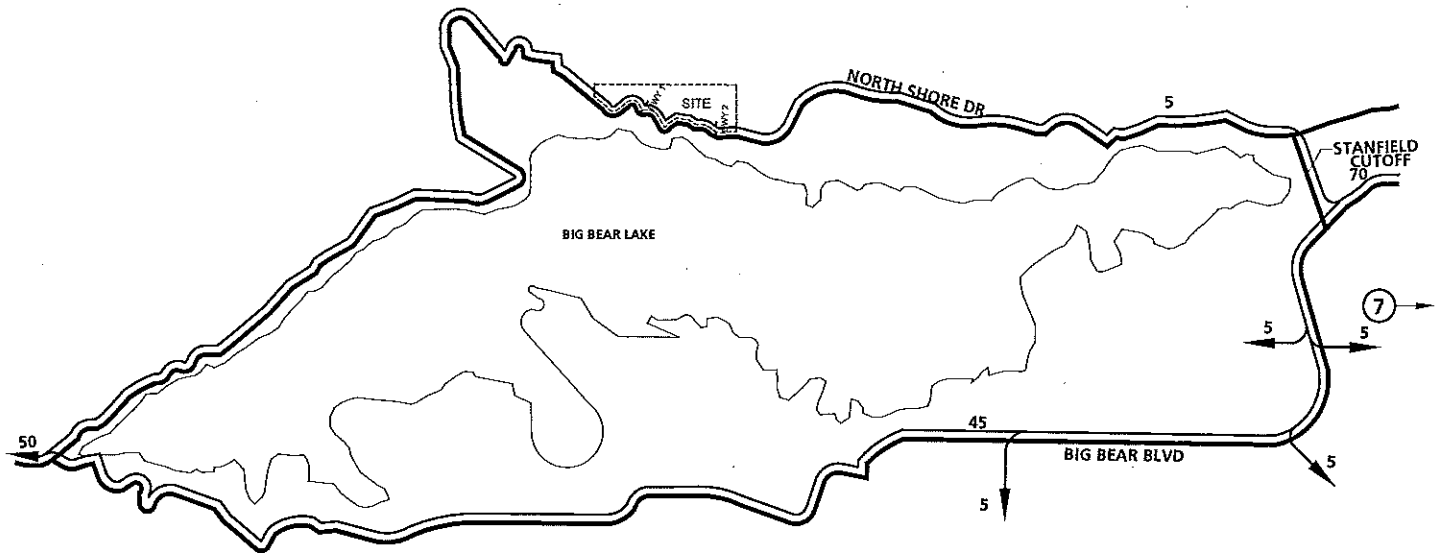
(6) = TT 16980

N

URBAN CROSSROADS

EXHIBIT D-7

TT 1776H
TRIP DISTRIBUTION



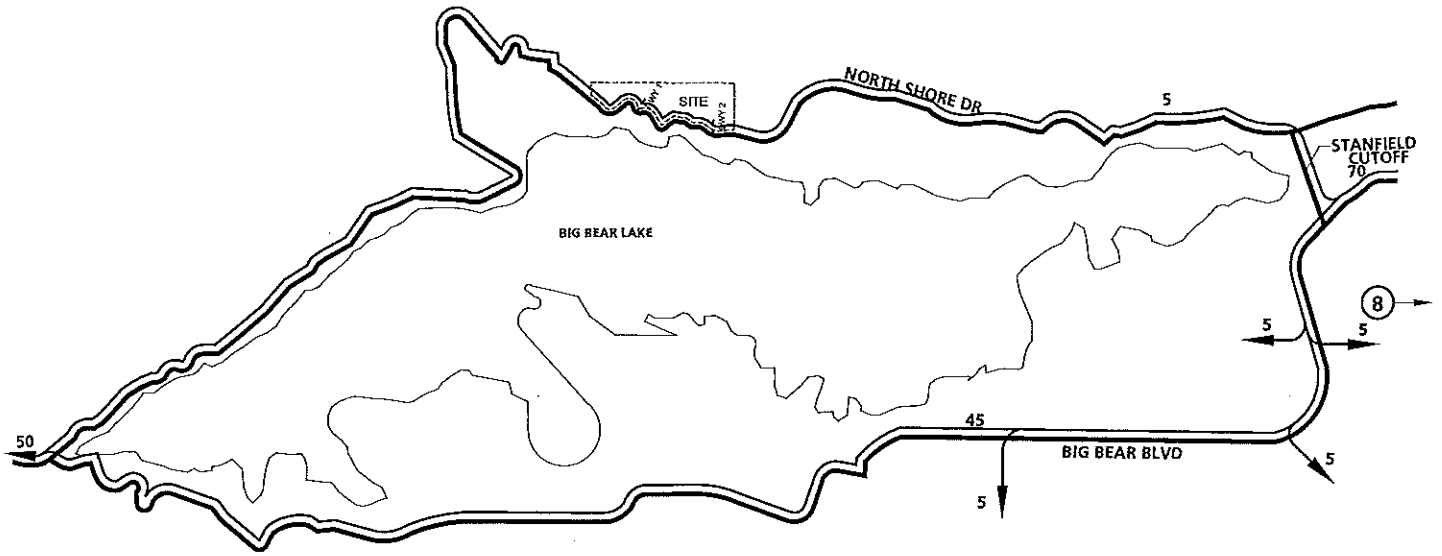
LEGEND:

(7) = TT 1776H

N

EXHIBIT D-8

TT 16749
TRIP DISTRIBUTION



LEGEND:

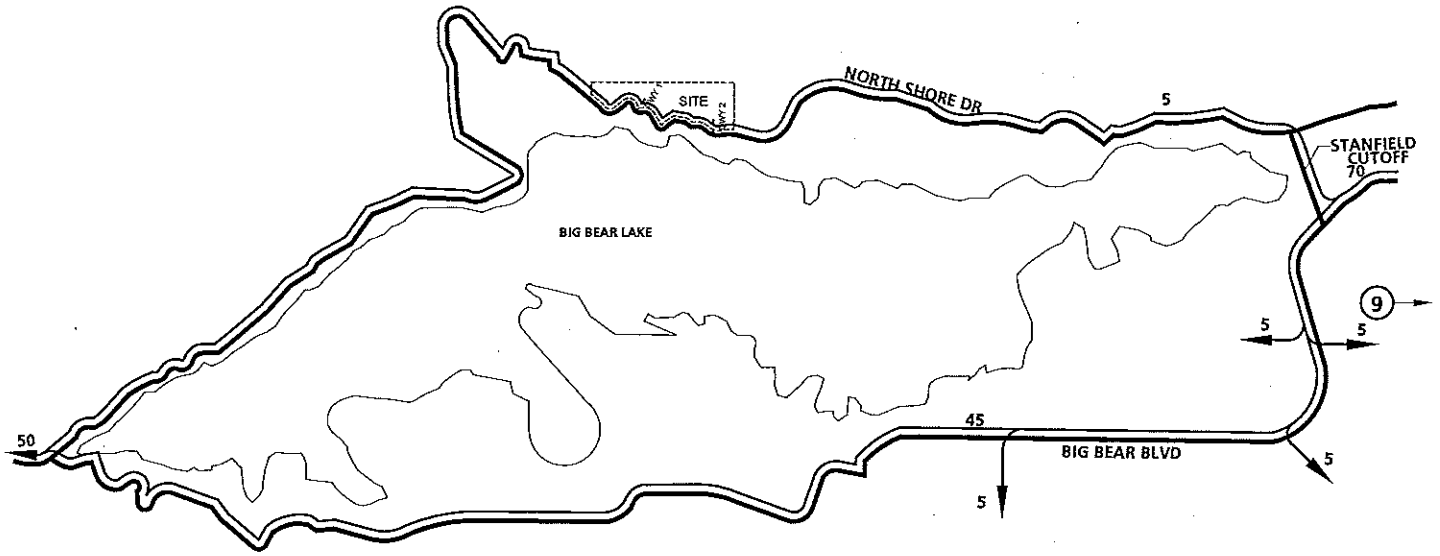
(8) = TT 16749

N

URBAN CROSSROADS

EXHIBIT D-9

TT 17201
TRIP DISTRIBUTION



LEGEND:

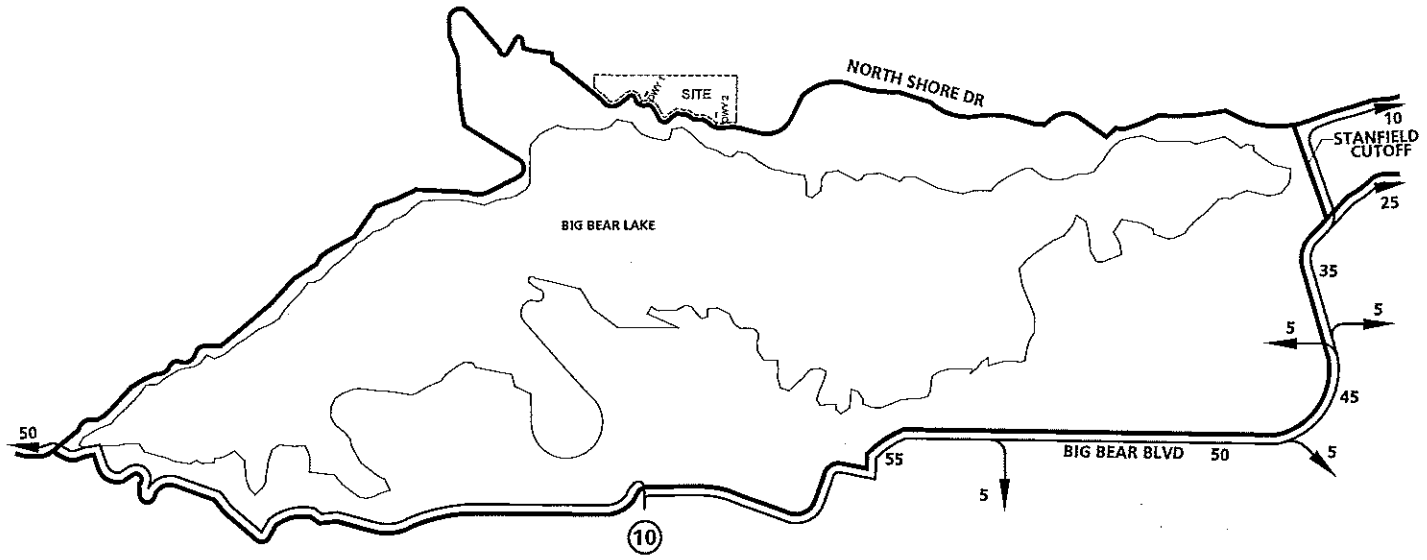
(9) = TT 17201

N

URBAN CROSSROADS

EXHIBIT D-10

HILTON GARDEN INN
TRIP DISTRIBUTION



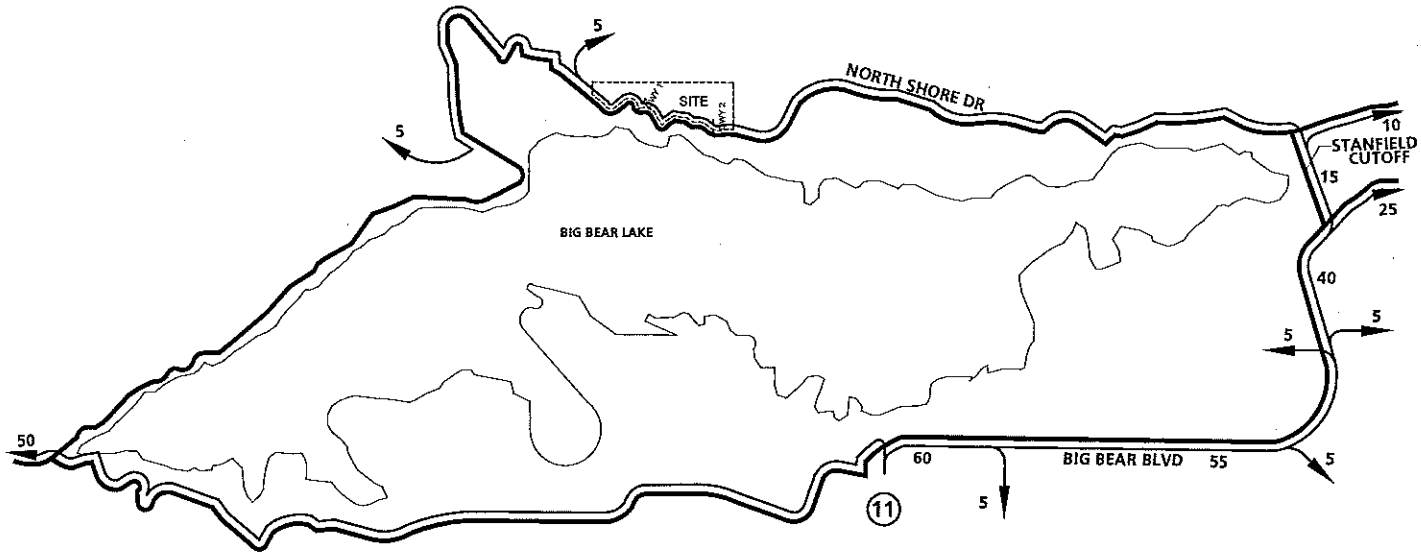
LEGEND:

(10) = HILTON GARDEN INN

N

EXHIBIT D-11

MIXED-USE DEVELOPMENT TRIP DISTRIBUTION



LEGEND:

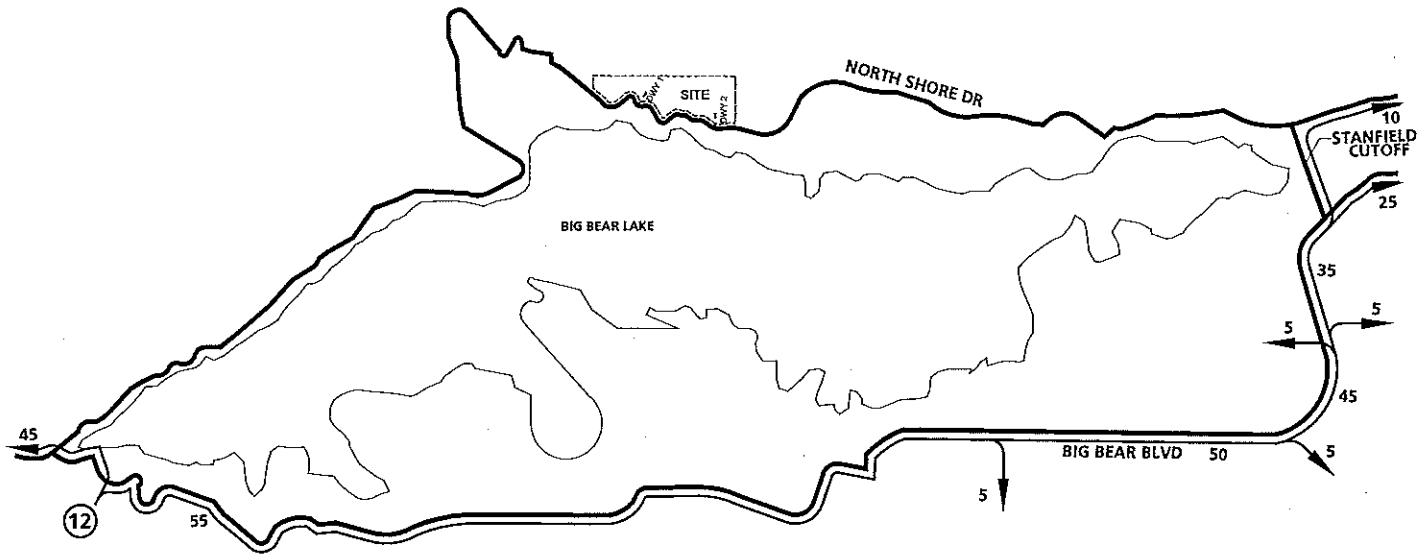
(11) = MIXED-USED DEVELOPMENT

N

URBAN CROSSROADS

EXHIBIT D-12

RESIDENTIAL LOTS TRIP DISTRIBUTION



LEGEND:

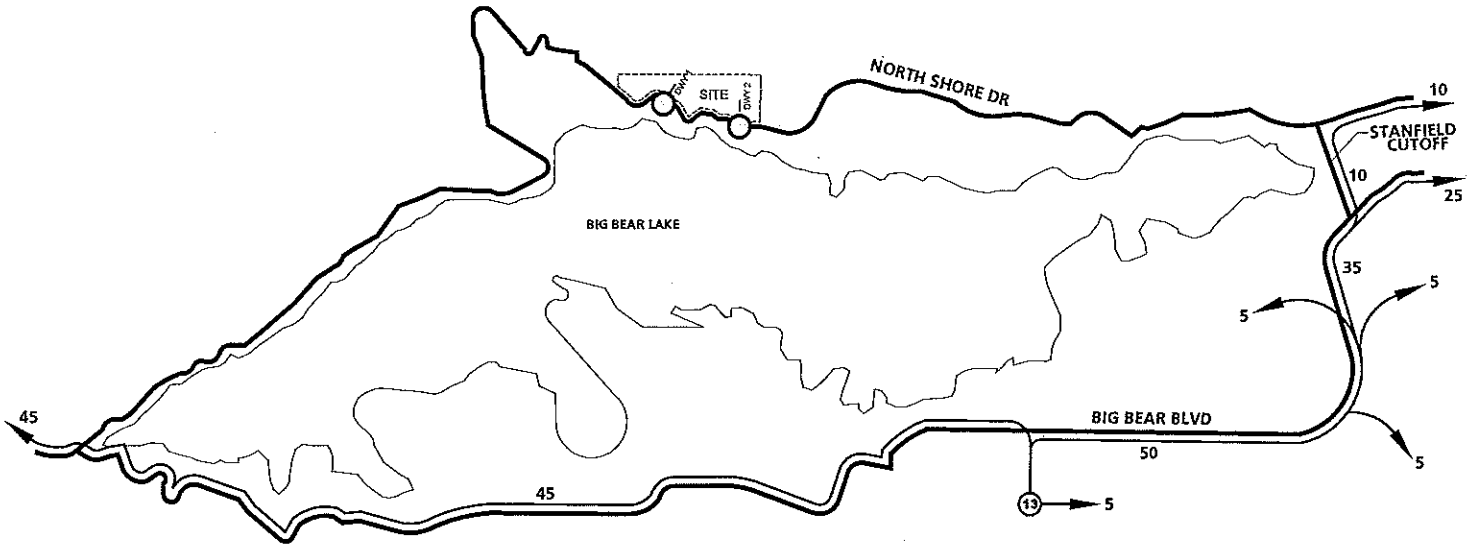
(12) = RESIDENTIAL LOTS

N

URBAN CROSSROADS

EXHIBIT D-13

CONDOMINIUMS



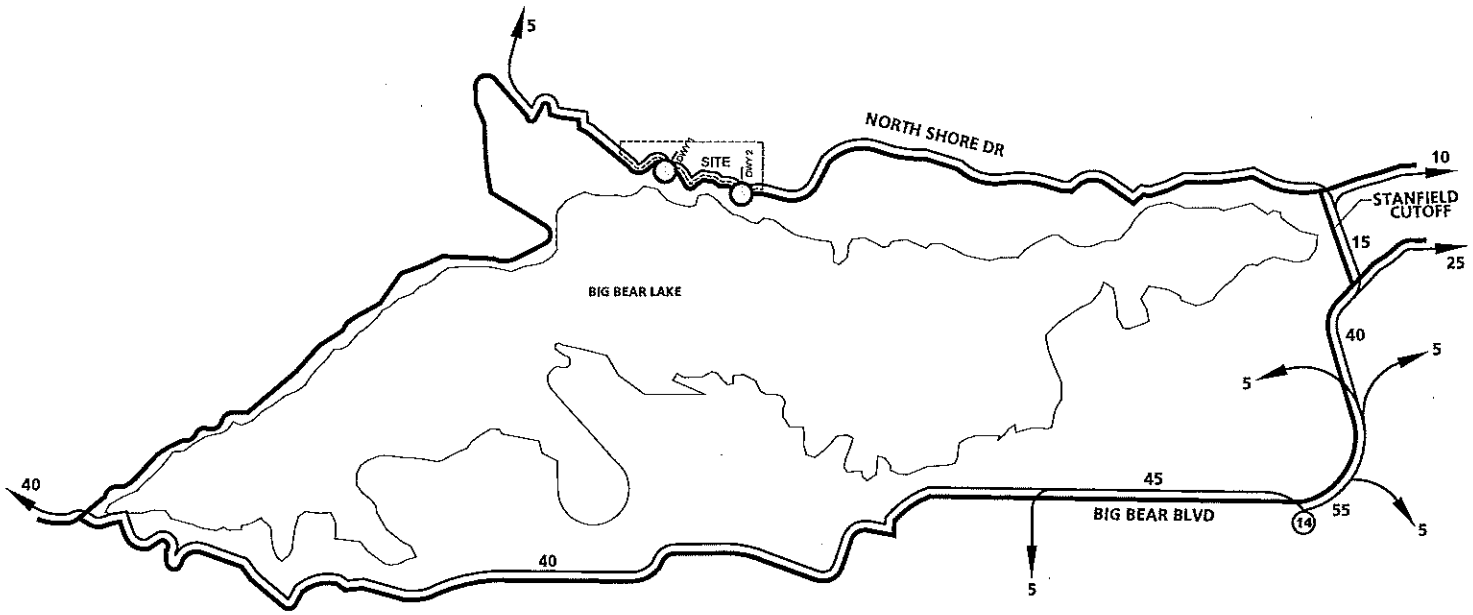
LEGEND:

⑬ = CONDOMINIUMS

N

EXHIBIT D-14

41820 BIG BEAR BLVD.



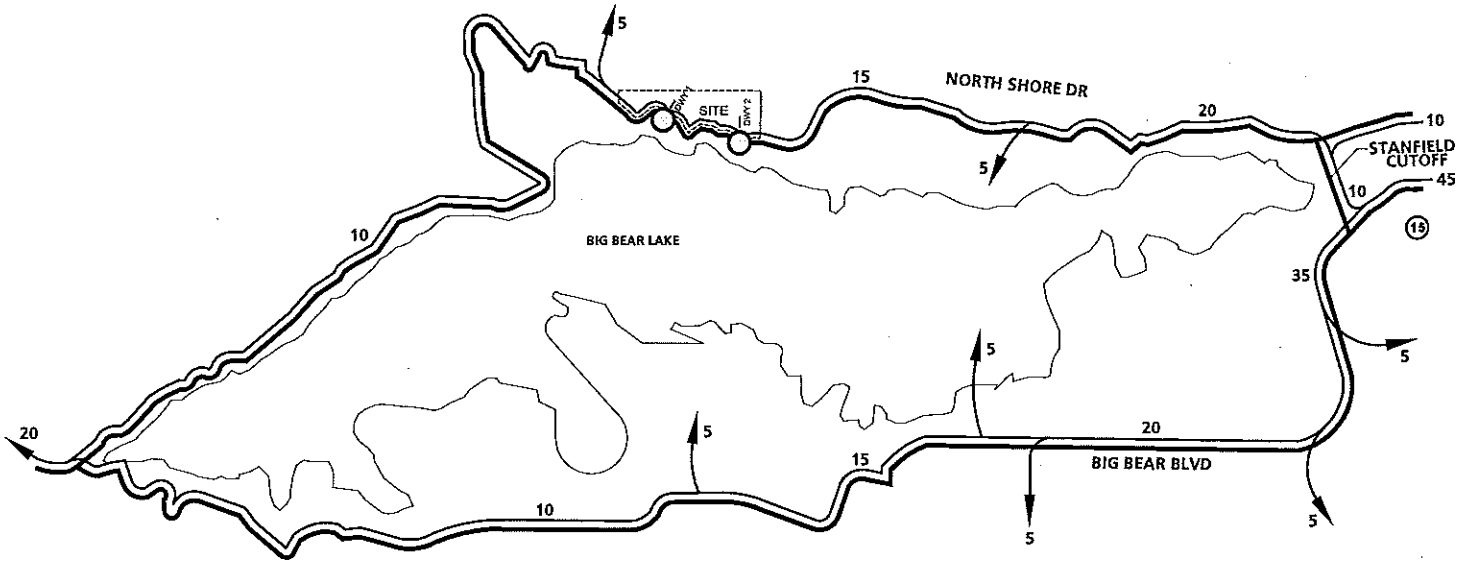
LEGEND:

⑭ = 41820 BIG BEAR BLVD.

N

EXHIBIT D-15

WORLD HARVEST FAITH CENTER



LEGEND:

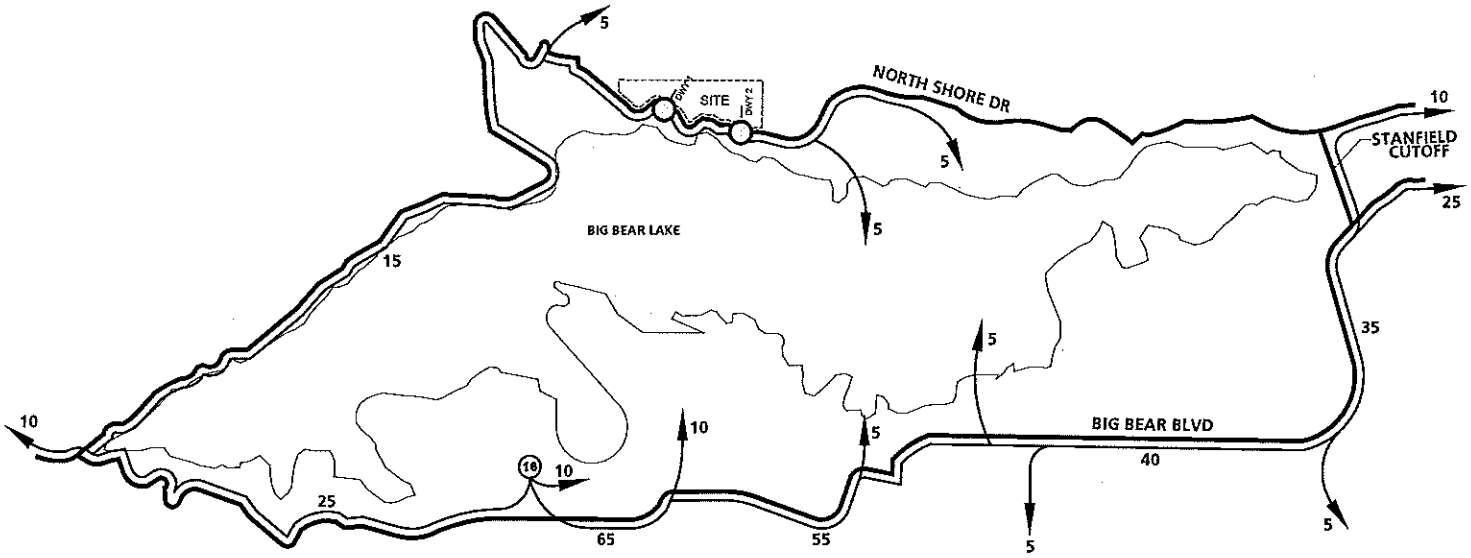
⑮ = WORLD HARVEST FAITH CENTER

N

URBAN CROSSROADS

EXHIBIT D-16

BOAT PARTS RETAIL & SERVICE



LEGEND:

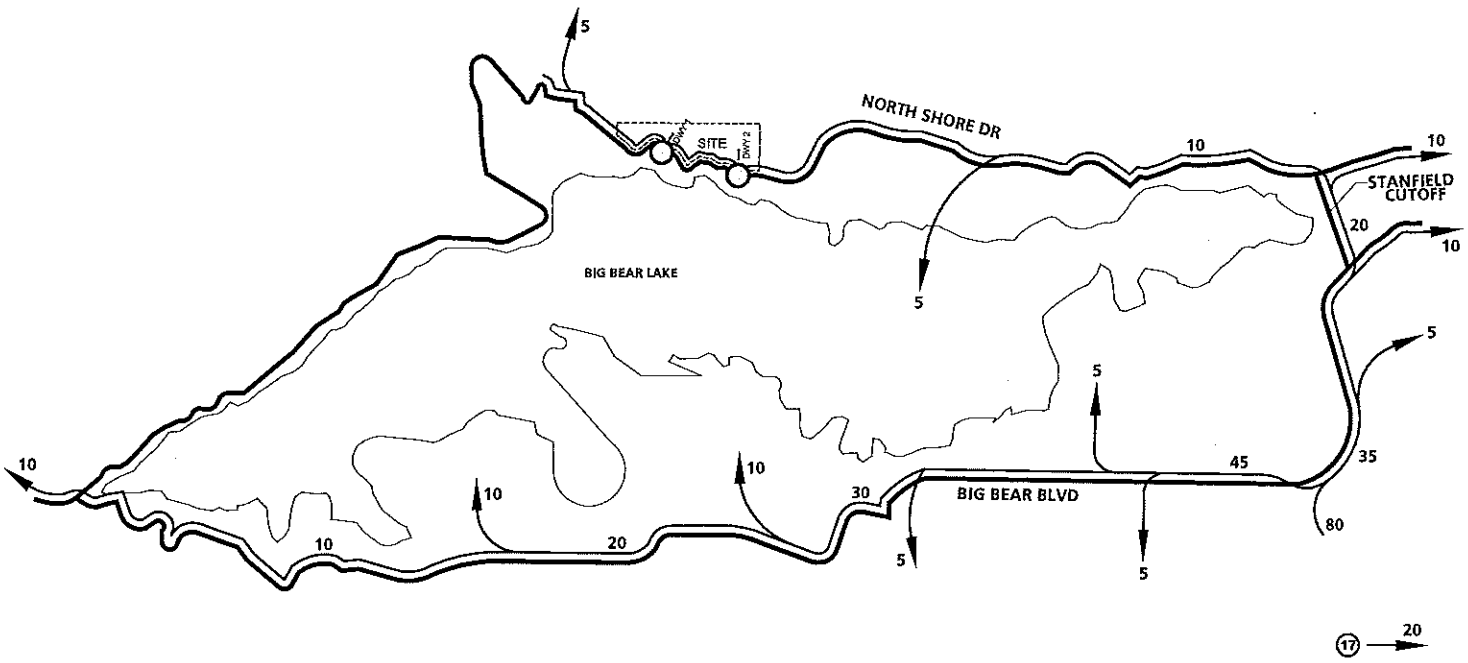
⑯ = BOAT PARTS RETAIL & SERVICE

N

URBAN CROSSROADS

EXHIBIT D-17

STORAGE YARD



LEGEND:

⑰ = STORAGE YARD

N

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APPENDIX E

2010 CONDITIONS INTERSECTION ANALYSIS WITHOUT PROJECT

MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 Without Project Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

Average Delay (sec/veh): OVERFLOW Worst Case Level Of Service: F[xxxxx]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Channel			Include		
Lanes:	0 0 1! 0 0			0 0 0 0 0			0 0 1 0 1			1 0 1 0 0		
Volume Module:												
Base Vol:	24	0	27	0	0	0	0	322	21	87	300	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	29	0	33	0	0	0	0	393	26	106	366	0
Added Vol:	226	0	1	0	0	0	0	73	314	1	42	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	255	0	34	0	0	0	0	466	340	107	408	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
PHF Volume:	305	0	41	0	0	0	0	557	406	128	488	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	305	0	41	0	0	0	0	557	406	128	488	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	6.5	6.2	7.1	6.5	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.0	3.3	3.5	4.0	xxxxx
Capacity Module:												
Cnflict Vol:	0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	651	0	910	631	xxxxx
Potent Cap.:	900	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	390	900	258	401	xxxxx
Move Cap.:	900	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	231	900	0	237	xxxxx
Volume/Cap:	0.34	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	2.42	0.45	xxxx	2.06	xxxx
Level Of Service Module:												
2Way95thQ:	1.5	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	45.4	2.4	xxxx	36.4	xxxxx
Control Del:	11.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	683	12.2	xxxxx	525	xxxxx
LOS by Move:	B	*	*	*	*	*	*	F	B	*	F	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			400.2			xxxxxx		
ApproachLOS:	*			*			F			F		

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2011 Without Project Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

Cycle (sec):	60	Critical Vol./Cap.(X):	0.534
Loss Time (sec):	6 (Y+R=4.0 sec)	Average Delay (sec/veh):	14.0
Optimal Cycle:	47	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	17	0	17	0	0	0	0	12	12	12	12	0
Lanes:	1 0	0	0 1	0	0 0	0 0	0	0 2	0 1	1	0 1	0 0
Volume Module:												
Base Vol:	24	0	27	0	0	0	0	322	21	87	300	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	29	0	33	0	0	0	0	393	26	106	366	0
Added Vol:	226	0	1	0	0	0	0	73	314	1	42	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	255	0	34	0	0	0	0	466	340	107	408	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
PHF Volume:	305	0	41	0	0	0	0	557	406	128	488	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	305	0	41	0	0	0	0	557	406	128	488	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.00	1.00	1.00
FinalVolume:	305	0	41	0	0	0	0	585	406	128	488	0
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	2.00	1.00	1.00	1.00	0.00
Final Sat.:	1700	0	1800	0	0	0	0	3600	1800	1700	1800	0
Capacity Analysis Module:												
Vol/Sat:	0.18	0.00	0.02	0.00	0.00	0.00	0.00	0.16	0.23	0.08	0.27	0.00
Crit Moves:	****								****	****		
Green/Cycle:	0.31	0.00	0.31	0.00	0.00	0.00	0.00	0.39	0.39	0.20	0.59	0.00
Volume/Cap:	0.58	0.00	0.07	0.00	0.00	0.00	0.00	0.42	0.58	0.38	0.46	0.00
Delay/Veh:	21.6	0.0	14.5	0.0	0.0	0.0	0.0	13.0	16.5	23.9	5.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	21.6	0.0	14.5	0.0	0.0	0.0	0.0	13.0	16.5	23.9	5.6	0.0
LOS by Move:	C	A	B	A	A	A	A	B	B	C	A	A
HCM2kAvgQ:	5	0	0	0	0	0	0	4	6	2	4	0

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 Without Project Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

Average Delay (sec/veh): 54.9 Worst Case Level Of Service: F[137.9]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 1 0 0 0			0 0 0 1 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	58	5	208	5	10	0	0	74	70	218	54	6
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	71	6	254	6	12	0	0	90	85	266	66	7
Added Vol:	33	0	43	0	0	0	0	38	47	38	22	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	104	6	297	6	12	0	0	128	132	304	88	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	116	7	331	7	14	0	0	143	148	339	98	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	116	7	331	7	14	0	0	143	148	339	98	8
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1003	1001	217	1165	1070	xxxxx	xxxx	xxxx	xxxxx	291	xxxx	xxxxx
Potent Cap.:	223	245	828	173	223	xxxxx	xxxx	xxxx	xxxxx	1283	xxxx	xxxxx
Move Cap.:	156	165	828	75	150	xxxxx	xxxx	xxxx	xxxxx	1283	xxxx	xxxxx
Volume/Cap:	0.74	0.04	0.40	0.09	0.09	xxxx	xxxx	xxxx	xxxx	0.26	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1.1	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.8	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	383	xxxxx	113	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	18.2	xxxxx	0.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	138	xxxxx	43.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	F	*	E	*	*	*	*	*	*	*	*
ApproachDel:	137.9			43.8			xxxxxx			xxxxxx		
ApproachLOS:	F			E			*			*		

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2011 Without Project Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

Cycle (sec):	60	Critical Vol./Cap.(X):	0.637
Loss Time (sec):	8 (Y+R=4.0 sec)	Average Delay (sec/veh):	31.9
Optimal Cycle:	54	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	13	13	10	13	13	10	13	13	10	13	13
Lanes:	1 0	0	1 0	1 0	0	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	58	5	208	5	10	0	0	74	70	218	54	6
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	71	6	254	6	12	0	0	90	85	266	66	7
Added Vol:	33	0	43	0	0	0	0	38	47	38	22	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	104	6	297	6	12	0	0	128	132	304	88	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	116	7	331	7	14	0	0	143	148	339	98	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	116	7	331	7	14	0	0	143	148	339	98	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	116	7	331	7	14	0	0	143	148	339	98	8
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.02	0.98	1.00	1.00	0.00	1.00	0.49	0.51	1.00	0.92	0.08
Final Sat.:	1700	36	1764	1700	1800	0	1700	886	914	1700	1662	138
Capacity Analysis Module:												
Vol/Sat:	0.07	0.19	0.19	0.00	0.01	0.00	0.00	0.16	0.16	0.20	0.06	0.06
Crit Moves:		****		****				****		****		
Green/Cycle:	0.17	0.23	0.23	0.17	0.23	0.00	0.00	0.22	0.22	0.25	0.47	0.47
Volume/Cap:	0.39	0.80	0.80	0.02	0.03	0.00	0.00	0.75	0.75	0.80	0.13	0.13
Delay/Veh:	25.8	36.4	36.4	21.1	18.2	0.0	0.0	34.2	34.2	35.8	7.7	7.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.8	36.4	36.4	21.1	18.2	0.0	0.0	34.2	34.2	35.8	7.7	7.7
LOS by Move:	C	D	D	C	B	A	A	C	C	D	A	A
HCM2kAvgQ:	2	8	8	0	0	0	0	7	7	9	1	1

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 Without Project Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	130	Critical Vol./Cap.(X):	1.140
Loss Time (sec):	8 (Y+R=2.0 sec)	Average Delay (sec/veh):	242.2
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	0 1	0 0	1	0 1	0 0	1	1 0	1 0	1	1 0	1 0	1
Volume Module:												
Base Vol:	61	18	61	12	28	256	287	872	77	17	664	13
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	74	22	74	15	34	312	350	1064	94	21	810	16
Added Vol:	0	0	0	13	0	71	68	294	0	0	215	8
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	74	22	74	28	34	383	418	1358	94	21	1025	24
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	77	23	77	29	35	396	432	1403	97	21	1059	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	77	23	77	29	35	396	432	1403	97	21	1059	25
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	77	23	77	29	35	396	432	1403	97	21	1059	25
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	0.78	0.22	1.00	0.46	0.54	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1329	392	1800	784	969	1800	1700	1800	1800	1700	1800	1800
Capacity Analysis Module:												
Vol/Sat:	0.06	0.06	0.04	0.04	0.04	0.22	0.25	0.78	0.05	0.01	0.59	0.01
Crit Moves:	****					****		****		****		
Green/Cycle:	0.18	0.18	0.18	0.18	0.18	0.18	0.17	0.49	0.49	0.08	0.40	0.40
Volume/Cap:	0.31	0.31	0.23	0.20	0.20	1.19	1.48	1.58	0.11	0.16	1.48	0.03
Delay/Veh:	48.4	48.4	46.8	46.2	46.2	165.1	287.4	293	14.0	58.8	259	21.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	48.4	48.4	46.8	46.2	46.2	165.1	287.4	293	14.0	58.8	259	21.5
LOS by Move:	D	D	D	D	D	F	F	F	B	E	F	C
HCM2kAvgQ:	4	4	3	2	2	26	38	118	1	1	84	0

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2011 Without Project Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	80	Critical Vol./Cap.(X):	0.875
Loss Time (sec):	6 (Y+R=2.0 sec)	Average Delay (sec/veh):	31.4
Optimal Cycle:	76	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	1 0	0 1	0	1 0	0 1	0	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	61	18	61	12	28	256	287	872	77	17	664	13
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	74	22	74	15	34	312	350	1064	94	21	810	16
Added Vol:	0	0	0	13	0	71	68	294	0	0	215	8
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	74	22	74	28	34	383	418	1358	94	21	1025	24
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	77	23	77	29	35	396	432	1403	97	21	1059	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	77	23	77	29	35	396	432	1403	97	21	1059	25
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.05	1.05
FinalVolume:	77	23	77	29	35	396	432	1473	102	21	1112	26
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.23	0.77	1.00	0.08	0.92	1.00	1.87	0.13	1.00	1.95	0.05
Final Sat.:	1700	410	1390	1700	147	1653	1700	3367	233	1700	3518	82
Capacity Analysis Module:												
Vol/Sat:	0.05	0.06	0.06	0.02	0.24	0.24	0.25	0.44	0.44	0.01	0.32	0.32
Crit Moves:					****		****				****	
Green/Cycle:	0.30	0.30	0.30	0.30	0.30	0.30	0.28	0.49	0.49	0.14	0.35	0.35
Volume/Cap:	0.15	0.18	0.18	0.06	0.80	0.80	0.91	0.90	0.90	0.09	0.91	0.91
Delay/Veh:	20.9	21.2	21.2	19.9	37.1	37.1	52.3	22.7	22.7	30.8	35.2	35.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.9	21.2	21.2	19.9	37.1	37.1	52.3	22.7	22.7	30.8	35.2	35.2
LOS by Move:	C	C	C	B	D	D	D	C	C	C	D	D
HCM2kAvgQ:	1	2	2	0	12	12	15	21	21	1	17	17

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 Without Project Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

****

Average Delay (sec/veh): OVERFLOW Worst Case Level Of Service: F[xxxxx]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Channel			Include		
Lanes:	0 0 1! 0 0			0 0 0 0 0			0 0 1 0 1			1 0 1 0 0		
Volume Module:												
Base Vol:	40	0	94	0	0	0	0	958	33	67	411	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	49	0	115	0	0	0	0	1169	40	82	501	0
Added Vol:	226	0	1	0	0	0	0	73	314	1	42	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	275	0	116	0	0	0	0	1242	354	83	543	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	301	0	127	0	0	0	0	1362	388	91	596	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	301	0	127	0	0	0	0	1362	388	91	596	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	6.5	6.2	7.1	6.5	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.0	3.3	3.5	4.0	xxxxx
Capacity Module:												
Cnflict Vol:	0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	729	0	1347	666	xxxxx
Potent Cap.:	900	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	352	900	130	383	xxxxx
Move Cap.:	900	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	210	900	0	229	xxxxx
Volume/Cap:	0.33	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	6.47	0.43	xxxx	2.60	xxxx
Level Of Service Module:												
2Way95thQ:	1.5	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	147	2.2	xxxx	50.3	xxxxx
Control Del:	11.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	2504	12.0	xxxxx	767	xxxxx
LOS by Move:	B	*	*	*	*	*	*	F	B	*	F	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			1951.2			xxxxxx		
ApproachLOS:	*			*			F			F		

****

Note: Queue reported is the number of cars per lane.

****

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 Without Project Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

Cycle (sec):	60	Critical Vol./Cap.(X):	0.697
Loss Time (sec):	6 (Y+R=4.0 sec)	Average Delay (sec/veh):	21.2
Optimal Cycle:	47	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	17	0	17	0	0	0	0	12	12	12	12	0
Lanes:	1 0	0	0 1	0	0 0	0 0	0	0 2	0 1	1 0	1 0	0
Volume Module:												
Base Vol:	40	0	94	0	0	0	0	958	33	67	411	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	49	0	115	0	0	0	0	1169	40	82	501	0
Added Vol:	226	0	1	0	0	0	0	73	314	1	42	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	275	0	116	0	0	0	0	1242	354	83	543	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	301	0	127	0	0	0	0	1362	388	91	596	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	301	0	127	0	0	0	0	1362	388	91	596	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.00	1.00	1.00
FinalVolume:	301	0	127	0	0	0	0	1430	388	91	596	0
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	2.00	1.00	1.00	1.00	0.00
Final Sat.:	1700	0	1800	0	0	0	0	3600	1800	1700	1800	0
Capacity Analysis Module:												
Vol/Sat:	0.18	0.00	0.07	0.00	0.00	0.00	0.00	0.40	0.22	0.05	0.33	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.28	0.00	0.28	0.00	0.00	0.00	0.00	0.42	0.42	0.20	0.62	0.00
Volume/Cap:	0.63	0.00	0.25	0.00	0.00	0.00	0.00	0.95	0.52	0.27	0.54	0.00
Delay/Veh:	24.7	0.0	17.7	0.0	0.0	0.0	0.0	29.3	14.0	22.2	5.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	24.7	0.0	17.7	0.0	0.0	0.0	0.0	29.3	14.0	22.2	5.4	0.0
LOS by Move:	C	A	B	A	A	A	A	C	B	C	A	A
HCM2kAvgQ:	6	0	2	0	0	0	0	19	5	2	4	0

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 Without Project Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

****

Average Delay (sec/veh): 82.7 Worst Case Level Of Service: F[219.6]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	110	4	174	8	6	6	4	80	120	177	84	6
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	134	5	212	10	7	7	5	98	146	216	102	7
Added Vol:	33	0	43	0	0	0	0	38	47	38	22	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	167	5	255	10	7	7	5	136	193	254	124	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	181	5	277	11	8	8	5	147	210	275	135	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	181	5	277	11	8	8	5	147	210	275	135	8
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	959	955	252	1092	1056	139	143	xxxx	xxxxx	356	xxxx	xxxxx
Potent Cap.:	239	260	792	194	227	915	1452	xxxx	xxxxx	1213	xxxx	xxxxx
Move Cap.:	181	190	792	98	166	915	1452	xxxx	xxxxx	1213	xxxx	xxxxx
Volume/Cap:	1.00	0.03	0.35	0.11	0.05	0.01	0.00	xxxx	xxxx	0.23	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.9	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	8.8	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	335	xxxxx	xxxx	160	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	23.4	xxxxx	xxxxx	0.6	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	220	xxxxx	xxxxx	31.8	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	F	*	*	D	*	*	*	*	*	*	*
ApproachDel:	219.6			31.8			xxxxxx			xxxxxx		
ApproachLOS:	F			D			*			*		

****

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 Without Project Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

****

Cycle (sec):	60	Critical Vol./Cap.(X):	0.603
Loss Time (sec):	8 (Y+R=4.0 sec)	Average Delay (sec/veh):	30.7
Optimal Cycle:	54	Level Of Service:	C

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	13	13	10	13	13	10	13	13	10	13	13
Lanes:	1 0	0 1	0	1 0	0 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	110	4	174	8	6	6	4	80	120	177	84	6
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	134	5	212	10	7	7	5	98	146	216	102	7
Added Vol:	33	0	43	0	0	0	0	38	47	38	22	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	167	5	255	10	7	7	5	136	193	254	124	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	181	5	277	11	8	8	5	147	210	275	135	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	181	5	277	11	8	8	5	147	210	275	135	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	181	5	277	11	8	8	5	147	210	275	135	8
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.02	0.98	1.00	0.50	0.50	1.00	0.41	0.59	1.00	0.94	0.06
Final Sat.:	1700	34	1766	1700	900	900	1700	742	1058	1700	1700	100
Capacity Analysis Module:												
Vol/Sat:	0.11	0.16	0.16	0.01	0.01	0.01	0.00	0.20	0.20	0.16	0.08	0.08
Crit Moves:		****		****				****		****		
Green/Cycle:	0.17	0.22	0.22	0.17	0.22	0.22	0.21	0.27	0.27	0.22	0.27	0.27
Volume/Cap:	0.64	0.72	0.72	0.04	0.04	0.04	0.01	0.74	0.74	0.74	0.29	0.29
Delay/Veh:	33.9	32.9	32.9	21.2	18.8	18.8	18.9	30.2	30.2	34.7	18.7	18.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	33.9	32.9	32.9	21.2	18.8	18.8	18.9	30.2	30.2	34.7	18.7	18.7
LOS by Move:	C	C	C	C	B	B	B	C	C	C	B	B
HCM2kAvgQ:	4	6	6	0	0	0	0	8	8	7	2	2

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Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 Without Project Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	130	Critical Vol./Cap.(X):	1.139
Loss Time (sec):	8 (Y+R=2.0 sec)	Average Delay (sec/veh):	207.6
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	0 1	0 0	1	0 1	0 0	1	1 0	1 0	1	1 0	1 0	1
Volume Module:												
Base Vol:	63	40	69	21	34	265	230	807	49	37	635	22
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	77	49	84	26	41	323	281	985	60	45	775	27
Added Vol:	0	0	0	13	0	71	68	294	0	0	215	8
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	77	49	84	39	41	394	349	1279	60	45	990	35
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	80	51	88	40	43	410	362	1329	62	47	1029	36
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	80	51	88	40	43	410	362	1329	62	47	1029	36
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	80	51	88	40	43	410	362	1329	62	47	1029	36
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	0.63	0.37	1.00	0.50	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1063	675	1800	844	906	1800	1700	1800	1800	1700	1800	1800
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.05	0.05	0.05	0.23	0.21	0.74	0.03	0.03	0.57	0.02
Crit Moves:		****				****		****		****		
Green/Cycle:	0.18	0.18	0.18	0.18	0.18	0.18	0.15	0.49	0.49	0.08	0.41	0.41
Volume/Cap:	0.41	0.41	0.26	0.26	0.26	1.23	1.38	1.50	0.07	0.36	1.38	0.05
Delay/Veh:	50.5	50.5	47.3	47.3	47.3	181.4	247.4	257	13.7	64.5	212	20.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	50.5	50.5	47.3	47.3	47.3	181.4	247.4	257	13.7	64.5	212	20.1
LOS by Move:	D	D	D	D	D	F	F	F	B	E	F	C
HCM2kAvgQ:	5	5	3	3	3	28	30	106	1	2	76	1

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 Without Project Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	80	Critical Vol./Cap.(X):	0.741
Loss Time (sec):	6 (Y+R=2.0 sec)	Average Delay (sec/veh):	26.8
Optimal Cycle:	58	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	1 0	0 1	0	1 0	0 1	0	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	63	40	69	21	34	265	230	807	49	37	635	22
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	77	49	84	26	41	323	281	985	60	45	775	27
Added Vol:	0	0	0	13	0	71	68	294	0	0	215	8
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	77	49	84	39	41	394	349	1279	60	45	990	35
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	80	51	88	40	43	410	362	1329	62	47	1029	36
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	80	51	88	40	43	410	362	1329	62	47	1029	36
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.05	1.05
FinalVolume:	80	51	88	40	43	410	362	1395	65	47	1080	38
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.37	0.63	1.00	0.10	0.90	1.00	1.91	0.09	1.00	1.93	0.07
Final Sat.:	1700	661	1139	1700	171	1629	1700	3439	161	1700	3478	122
Capacity Analysis Module:												
Vol/Sat:	0.05	0.08	0.08	0.02	0.25	0.25	0.21	0.41	0.41	0.03	0.31	0.31
Crit Moves:					****			****		****		
Green/Cycle:	0.31	0.31	0.31	0.31	0.31	0.31	0.25	0.49	0.49	0.13	0.37	0.37
Volume/Cap:	0.15	0.25	0.25	0.08	0.82	0.82	0.85	0.82	0.82	0.22	0.85	0.85
Delay/Veh:	20.4	21.5	21.5	19.6	38.2	38.2	46.8	17.8	17.8	33.9	28.4	28.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.4	21.5	21.5	19.6	38.2	38.2	46.8	17.8	17.8	33.9	28.4	28.4
LOS by Move:	C	C	C	B	D	D	D	B	B	C	C	C
HCM2kAvgQ:	1	2	2	1	13	13	12	16	16	1	15	15

Note: Queue reported is the number of cars per lane.

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APPENDIX F

2010 CONDITIONS INTERSECTION ANALYSIS WITH PROJECT

MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

****

Average Delay (sec/veh): OVERFLOW Worst Case Level Of Service: F[xxxxx]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Channel			Include		
Lanes:	0 0 1! 0 0			0 0 0 0 0			0 0 1 0 1			1 0 1 0 0		
Volume Module:												
Base Vol:	24	0	27	0	0	0	0	322	21	87	300	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	29	0	33	0	0	0	0	393	26	106	366	0
Added Vol:	226	0	6	0	0	0	0	77	314	4	45	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	255	0	39	0	0	0	0	470	340	110	411	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
PHF Volume:	305	0	47	0	0	0	0	562	406	132	492	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	305	0	47	0	0	0	0	562	406	132	492	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	6.5	6.2	7.1	6.5	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.0	3.3	3.5	4.0	xxxxx
Capacity Module:												
Cnflict Vol:	0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	657	0	915	634	xxxxx
Potent Cap.:	900	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	387	900	256	399	xxxxx
Move Cap.:	900	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	229	900	0	236	xxxxx
Volume/Cap:	0.34	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	2.46	0.45	xxxx	2.08	xxxx
Level Of Service Module:												
2Way95thQ:	1.5	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	46.2	2.4	xxxx	36.9	xxxxx
Control Del:	11.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	701	12.2	xxxxx	535	xxxxx
LOS by Move:	B	*	*	*	*	*	*	F	B	*	F	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			412.0			xxxxxx		
ApproachLOS:	*			*			F			F		

****

Note: Queue reported is the number of cars per lane.

****

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

****

Cycle (sec):	60	Critical Vol./Cap.(X):	0.536	
Loss Time (sec):	6 (Y+R=4.0 sec)	Average Delay (sec/veh):	14.0	
Optimal Cycle:	47	Level Of Service:	B	

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	17	0	17	0	0	0	0	12	12	12	12	0
Lanes:	1 0	0	0 1	0	0	0 0 0	0	0 2	0 1	1	0 1	0 0
Volume Module:												
Base Vol:	24	0	27	0	0	0	0	322	21	87	300	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	29	0	33	0	0	0	0	393	26	106	366	0
Added Vol:	226	0	6	0	0	0	0	77	314	4	45	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	255	0	39	0	0	0	0	470	340	110	411	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
PHF Volume:	305	0	47	0	0	0	0	562	406	132	492	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	305	0	47	0	0	0	0	562	406	132	492	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.00	1.00	1.00
FinalVolume:	305	0	47	0	0	0	0	590	406	132	492	0
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	2.00	1.00	1.00	1.00	0.00
Final Sat.:	1700	0	1800	0	0	0	0	3600	1800	1700	1800	0
Capacity Analysis Module:												
Vol/Sat:	0.18	0.00	0.03	0.00	0.00	0.00	0.00	0.16	0.23	0.08	0.27	0.00
Crit Moves:	****								****	****		
Green/Cycle:	0.31	0.00	0.31	0.00	0.00	0.00	0.00	0.39	0.39	0.20	0.59	0.00
Volume/Cap:	0.58	0.00	0.08	0.00	0.00	0.00	0.00	0.42	0.58	0.39	0.46	0.00
Delay/Veh:	21.6	0.0	14.6	0.0	0.0	0.0	0.0	13.0	16.5	24.1	5.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	21.6	0.0	14.6	0.0	0.0	0.0	0.0	13.0	16.5	24.1	5.6	0.0
LOS by Move:	C	A	B	A	A	A	A	B	B	C	A	A
HCM2kAvgQ:	5	0	1	0	0	0	0	4	6	3	4	0

****

Note: Queue reported is the number of cars per lane.

****

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****
Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)
****
Average Delay (sec/veh): 78.9 Worst Case Level Of Service: F[200.1]
****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1!	0	0	0 1	0	0 0	0 0	0	1 0	0 0	1!	0 0
Volume Module:												
Base Vol:	58	5	208	5	10	0	0	74	70	218	54	6
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	71	6	254	6	12	0	0	90	85	266	66	7
Added Vol:	50	0	43	0	0	0	0	41	57	38	27	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	121	6	297	6	12	0	0	131	142	304	93	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	135	7	331	7	14	0	0	146	159	339	104	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	135	7	331	7	14	0	0	146	159	339	104	8
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1018	1015	226	1180	1090	xxxxx	xxxx	xxxx	xxxxx	305	xxxx	xxxxx
Potent Cap.:	218	240	819	169	217	xxxxx	xxxx	xxxx	xxxxx	1267	xxxx	xxxxx
Move Cap.:	151	161	819	73	145	xxxxx	xxxx	xxxx	xxxxx	1267	xxxx	xxxxx
Volume/Cap:	0.89	0.04	0.40	0.09	0.09	xxxx	xxxx	xxxx	xxxx	0.27	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1.1	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.9	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	353	xxxxx	109	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	22.7	xxxxx	0.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	200	xxxxx	45.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	F	*	E	*	*	*	*	*	*	*	*
ApproachDel:		200.1			45.5			xxxxxx			xxxxxx	
ApproachLOS:		F			E			*			*	

****
Note: Queue reported is the number of cars per lane.
****

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

Cycle (sec):	60	Critical Vol./Cap.(X):	0.647
Loss Time (sec):	8 (Y+R=4.0 sec)	Average Delay (sec/veh):	32.4
Optimal Cycle:	54	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	13	13	10	13	13	10	13	13	10	13	13
Lanes:	1 0	0 1	0	1 0	0 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	58	5	208	5	10	0	0	74	70	218	54	6
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	71	6	254	6	12	0	0	90	85	266	66	7
Added Vol:	50	0	43	0	0	0	0	41	57	38	27	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	121	6	297	6	12	0	0	131	142	304	93	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	135	7	331	7	14	0	0	146	159	339	104	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	135	7	331	7	14	0	0	146	159	339	104	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	135	7	331	7	14	0	0	146	159	339	104	8
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.02	0.98	1.00	1.00	0.00	1.00	0.48	0.52	1.00	0.93	0.07
Final Sat.:	1700	36	1764	1700	1800	0	1700	863	937	1700	1669	131
Capacity Analysis Module:												
Vol/Sat:	0.08	0.19	0.19	0.00	0.01	0.00	0.00	0.17	0.17	0.20	0.06	0.06
Crit Moves:		****		****				****		****		
Green/Cycle:	0.17	0.23	0.23	0.17	0.23	0.00	0.00	0.22	0.22	0.25	0.47	0.47
Volume/Cap:	0.45	0.80	0.80	0.02	0.03	0.00	0.00	0.78	0.78	0.80	0.13	0.13
Delay/Veh:	27.2	36.4	36.4	21.1	18.2	0.0	0.0	36.6	36.6	35.8	7.8	7.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.2	36.4	36.4	21.1	18.2	0.0	0.0	36.6	36.6	35.8	7.8	7.8
LOS by Move:	C	D	D	C	B	A	A	D	D	D	A	A
HCM2kAvgQ:	3	8	8	0	0	0	0	8	8	9	1	1

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	130	Critical Vol./Cap.(X):	1.145
Loss Time (sec):	8 (Y+R=2.0 sec)	Average Delay (sec/veh):	245.3
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	0 1	0	0 1	0 1	0	0 1	1 0	1	0 1	1 0	1	0 1
Volume Module:												
Base Vol:	61	18	61	12	28	256	287	872	77	17	664	13
Growth Adj:	1.22 1.22	1.22	1.22	1.22 1.22	1.22	1.22	1.22 1.22	1.22	1.22	1.22 1.22	1.22	1.22
Initial Bse:	74	22	74	15	34	312	350	1064	94	21	810	16
Added Vol:	0	0	0	16	0	79	81	294	0	0	215	13
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	74	22	74	31	34	391	431	1358	94	21	1025	29
User Adj:	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00
PHF Adj:	0.97 0.97	0.97	0.97	0.97 0.97	0.97	0.97	0.97 0.97	0.97	0.97	0.97 0.97	0.97	0.97
PHF Volume:	77	23	77	32	35	404	445	1403	97	21	1059	30
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	77	23	77	32	35	404	445	1403	97	21	1059	30
PCE Adj:	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00
MLF Adj:	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00
FinalVolume:	77	23	77	32	35	404	445	1403	97	21	1059	30
Saturation Flow Module:												
Sat/Lane:	1800 1800	1800	1800	1800 1800	1800	1800	1800 1800	1800	1800	1800 1800	1800	1800
Adjustment:	0.94 1.00	1.00	0.94	1.00 1.00	1.00	0.94	1.00 1.00	1.00	0.94	1.00 1.00	1.00	0.94
Lanes:	0.78 0.22	1.00	0.49	0.51 1.00	1.00	0.49	1.00 1.00	1.00	0.51	1.00 1.00	1.00	0.51
Final Sat.:	1329 392	1800	828	923 1800	1800	828	1700 1800	1800	923	1700 1800	1800	923
Capacity Analysis Module:												
Vol/Sat:	0.06 0.06	0.04	0.04	0.04 0.04	0.22	0.04	0.26 0.78	0.05	0.11	0.01 0.59	0.02	0.11
Crit Moves:	****				****		****			****		
Green/Cycle:	0.18 0.18	0.18	0.18	0.18 0.18	0.18	0.18	0.18 0.49	0.49	0.49	0.08 0.39	0.39	0.39
Volume/Cap:	0.31 0.31	0.23	0.21	0.21 1.22	1.49	0.21	1.49 1.58	0.11	0.23	0.16 1.49	0.04	0.28
Delay/Veh:	48.4 48.4	46.8	46.4	46.4 174.8	292.8	46.4	293 14.0	58.8	265	22.0		
User DelAdj:	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00
AdjDel/Veh:	48.4 48.4	46.8	46.4	46.4 174.8	292.8	46.4	293 14.0	58.8	265	22.0		
LOS by Move:	D	D	D	D	D	F	F	F	B	E	F	C
HCM2kAvgQ:	4	4	3	2	2	28	39	118	1	1	85	1

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	80	Critical Vol./Cap.(X):	0.891
Loss Time (sec):	6 (Y+R=2.0 sec)	Average Delay (sec/veh):	32.5
Optimal Cycle:	82	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	1 0	0 1	0	1 0	0 1	0	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	61	18	61	12	28	256	287	872	77	17	664	13
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	74	22	74	15	34	312	350	1064	94	21	810	16
Added Vol:	0	0	0	16	0	79	81	294	0	0	215	13
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	74	22	74	31	34	391	431	1358	94	21	1025	29
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	77	23	77	32	35	404	445	1403	97	21	1059	30
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	77	23	77	32	35	404	445	1403	97	21	1059	30
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.05	1.05
FinalVolume:	77	23	77	32	35	404	445	1473	102	21	1112	31
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.23	0.77	1.00	0.08	0.92	1.00	1.87	0.13	1.00	1.95	0.05
Final Sat.:	1700	410	1390	1700	145	1655	1700	3367	233	1700	3501	99
Capacity Analysis Module:												
Vol/Sat:	0.05	0.06	0.06	0.02	0.24	0.24	0.26	0.44	0.44	0.01	0.32	0.32
Crit Moves:					****		****				****	
Green/Cycle:	0.30	0.30	0.30	0.30	0.30	0.30	0.28	0.49	0.49	0.14	0.34	0.34
Volume/Cap:	0.15	0.18	0.18	0.06	0.81	0.81	0.93	0.90	0.90	0.09	0.93	0.93
Delay/Veh:	20.9	21.2	21.2	19.9	38.2	38.2	54.3	22.7	22.7	30.8	37.3	37.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.9	21.2	21.2	19.9	38.2	38.2	54.3	22.7	22.7	30.8	37.3	37.3
LOS by Move:	C	C	C	B	D	D	D	C	C	C	D	D
HCM2kAvgQ:	1	2	2	1	12	12	16	21	21	1	18	18

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #104 Site Driveway #1 (NS)/ North Shore (SR-38) (EW)

****

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: B[11.1]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			0 0 1! 0 0			0 1 0 0 0			0 0 0 1 0		
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	144	0	0	112	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	0	0	0	0	0	0	0	176	0	0	137	0
Added Vol:	0	0	0	5	0	2	3	91	0	0	59	8
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	5	0	2	3	267	0	0	196	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	5	0	2	3	281	0	0	206	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	5	0	2	3	281	0	0	206	8
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	497	497	210	214	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	536	477	835	1368	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	535	476	835	1368	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.01	0.00	0.00	0.00	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	596	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.0	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	11.1	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			11.1			xxxxxx			xxxxxx		
ApproachLOS:	*			B			*			*		

****

Note: Queue reported is the number of cars per lane.

****

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #105 Site Driveway #2 (NS)/ North Shore (SR-38) (EW)

****

Average Delay (sec/veh): 0.4 Worst Case Level Of Service: B[11.2]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0	0 0		0 0 1!	0 0		0 1	0 0 0		0 0	0 1	0
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	144	0	0	112	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	0	0	0	0	0	0	0	176	0	0	137	0
Added Vol:	0	0	0	9	0	4	6	89	0	0	63	14
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	9	0	4	6	265	0	0	200	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	9	0	4	6	279	0	0	210	15
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	9	0	4	6	279	0	0	210	15
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	509	509	218	225	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	528	470	827	1356	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	526	468	827	1356	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.02	0.00	0.01	0.00	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	592	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	11.2	xxxxx	7.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			11.2			xxxxxx			xxxxxx		
ApproachLOS:	*			B			*			*		

****

Note: Queue reported is the number of cars per lane.

****

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

Average Delay (sec/veh): OVERFLOW Worst Case Level Of Service: F[xxxxx]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Channel			Include		
Lanes:	0 0 1!	0	0	0 0 0	0	0	0 0 1	0	1	1 0 1	0	0
Volume Module:												
Base Vol:	40	0	94	0	0	0	0	958	33	67	411	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	49	0	115	0	0	0	0	1169	40	82	501	0
Added Vol:	226	0	3	0	0	0	0	87	314	2	51	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	275	0	118	0	0	0	0	1256	354	84	552	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	301	0	129	0	0	0	0	1377	388	92	606	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	301	0	129	0	0	0	0	1377	388	92	606	0
Critical Gap Module:												
Critical Gp:	4.1 xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	6.5	6.2	7.1	6.5	xxxxx	
FollowUpTim:	2.2 xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.0	3.3	3.5	4.0	xxxxx	
Capacity Module:												
Cnflict Vol:	0 xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	732	0	1356	667	xxxxx	
Potent Cap.:	900 xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	351	900	128	382	xxxxx	
Move Cap.:	900 xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	210	900	0	228	xxxxx	
Volume/Cap:	0.33 xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	6.56	0.43	xxxx	2.65	xxxx	
Level Of Service Module:												
2Way95thQ:	1.5 xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	149	2.2	xxxx	51.6	xxxxx	
Control Del:	11.0 xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	2546	12.0	xxxxx	788	xxxxx	
LOS by Move:	B	*	*	*	*	*	*	F	B	*	F	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	
SharedQueue:	xxxxx xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	
Shrd ConDel:	xxxxx xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			1988.3			xxxxxx		
ApproachLOS:	*			*			F			F		

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

Cycle (sec):	60	Critical Vol./Cap.(X):	0.703
Loss Time (sec):	6 (Y+R=4.0 sec)	Average Delay (sec/veh):	22.1
Optimal Cycle:	47	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	17	0	17	0	0	0	0	12	12	12	12	0
Lanes:	1 0	0	0 1	0	0 0	0 0	0	0 2	0 1	1 0	1	0 0
Volume Module:												
Base Vol:	40	0	94	0	0	0	0	958	33	67	411	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	49	0	115	0	0	0	0	1169	40	82	501	0
Added Vol:	226	0	3	0	0	0	0	87	314	2	51	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	275	0	118	0	0	0	0	1256	354	84	552	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	301	0	129	0	0	0	0	1377	388	92	606	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	301	0	129	0	0	0	0	1377	388	92	606	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.00	1.00	1.00
FinalVolume:	301	0	129	0	0	0	0	1446	388	92	606	0
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	2.00	1.00	1.00	1.00	0.00
Final Sat.:	1700	0	1800	0	0	0	0	3600	1800	1700	1800	0
Capacity Analysis Module:												
Vol/Sat:	0.18	0.00	0.07	0.00	0.00	0.00	0.00	0.40	0.22	0.05	0.34	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.28	0.00	0.28	0.00	0.00	0.00	0.00	0.42	0.42	0.20	0.62	0.00
Volume/Cap:	0.63	0.00	0.25	0.00	0.00	0.00	0.00	0.96	0.52	0.27	0.55	0.00
Delay/Veh:	24.7	0.0	17.8	0.0	0.0	0.0	0.0	31.0	14.0	22.2	5.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	24.7	0.0	17.8	0.0	0.0	0.0	0.0	31.0	14.0	22.2	5.5	0.0
LOS by Move:	C	A	B	A	A	A	A	C	B	C	A	A
HCM2kAvgQ:	6	0	2	0	0	0	0	19	5	2	4	0

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

****

Average Delay (sec/veh): 99.4 Worst Case Level Of Service: F[263.2]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	110	4	174	8	6	6	4	80	120	177	84	6
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	134	5	212	10	7	7	5	98	146	216	102	7
Added Vol:	46	0	43	0	0	0	0	40	55	38	25	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	180	5	255	10	7	7	5	138	201	254	127	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	195	5	277	11	8	8	5	149	218	275	138	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	195	5	277	11	8	8	5	149	218	275	138	8
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	969	965	258	1102	1070	142	146	xxxx	xxxxx	367	xxxx	xxxxx
Potent Cap.:	235	257	785	191	223	911	1448	xxxx	xxxxx	1202	xxxx	xxxxx
Move Cap.:	177	187	785	96	162	911	1448	xxxx	xxxxx	1202	xxxx	xxxxx
Volume/Cap:	1.10	0.03	0.35	0.11	0.05	0.01	0.00	xxxx	xxxx	0.23	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.9	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	8.9	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	322	xxxxx	xxxx	157	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	26.2	xxxxx	xxxxx	0.6	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	263	xxxxx	xxxxx	32.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	F	*	*	D	*	*	*	*	*	*	*
ApproachDel:	263.2			32.5			xxxxxx			xxxxxx		
ApproachLOS:	F			D			*			*		

****

Note: Queue reported is the number of cars per lane.

****

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

****

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

****

Cycle (sec): 60 Critical Vol./Cap.(X): 0.610
Loss Time (sec): 8 (Y+R=4.0 sec) Average Delay (sec/veh): 31.5
Optimal Cycle: 54 Level Of Service: C

****

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Protected						Protected						Protected						Protected					
Rights:	Include						Include						Include						Include					
Min. Green:	10		13		13		10		13		13		10		13		13		10		13		13	
Lanes:	1	0	0	1	0		1	0	0	1	0		1	0	0	1	0		1	0	0	1	0	
Volume Module:																								
Base Vol:	110	4	174				8	6	6				4	80	120				177	84	6			
Growth Adj:	1.22	1.22	1.22				1.22	1.22	1.22				1.22	1.22	1.22				1.22	1.22	1.22			
Initial Bse:	134	5	212				10	7	7				5	98	146				216	102	7			
Added Vol:	46	0	43				0	0	0				0	40	55				38	25	0			
PasserByVol:	0	0	0				0	0	0				0	0	0				0	0	0			
Initial Fut:	180	5	255				10	7	7				5	138	201				254	127	7			
User Adj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
PHF Adj:	0.92	0.92	0.92				0.92	0.92	0.92				0.92	0.92	0.92				0.92	0.92	0.92			
PHF Volume:	195	5	277				11	8	8				5	149	218				275	138	8			
Reduct Vol:	0	0	0				0	0	0				0	0	0				0	0	0			
Reduced Vol:	195	5	277				11	8	8				5	149	218				275	138	8			
PCE Adj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
MLF Adj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
FinalVolume:	195	5	277				11	8	8				5	149	218				275	138	8			
Saturation Flow Module:																								
Sat/Lane:	1800	1800	1800				1800	1800	1800				1800	1800	1800				1800	1800	1800			
Adjustment:	0.94	1.00	1.00				0.94	1.00	1.00				0.94	1.00	1.00				0.94	1.00	1.00			
Lanes:	1.00	0.02	0.98				1.00	0.50	0.50				1.00	0.41	0.59				1.00	0.95	0.05			
Final Sat.:	1700	34	1766				1700	900	900				1700	731	1069				1700	1702	98			
Capacity Analysis Module:																								
Vol/Sat:	0.11	0.16	0.16				0.01	0.01	0.01				0.00	0.20	0.20				0.16	0.08	0.08			
Crit Moves:		****					****							****					****					
Green/Cycle:	0.17	0.22	0.22				0.17	0.22	0.22				0.21	0.27	0.27				0.21	0.27	0.27			
Volume/Cap:	0.69	0.72	0.72				0.04	0.04	0.04				0.01	0.76	0.76				0.76	0.30	0.30			
Delay/Veh:	36.4	32.9	32.9				21.2	18.8	18.8				18.9	30.7	30.7				35.8	18.8	18.8			
User DelAdj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
AdjDel/Veh:	36.4	32.9	32.9				21.2	18.8	18.8				18.9	30.7	30.7				35.8	18.8	18.8			
LOS by Move:	D		C		C		C		B		B		B		C		C		D		B		B	
HCM2kAvgQ:	5		6		6		0		0		0		0		8		8		7		2		2	

****

Note: Queue reported is the number of cars per lane.

****

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	130	Critical Vol./Cap.(X):	1.143
Loss Time (sec):	8 (Y+R=2.0 sec)	Average Delay (sec/veh):	210.8
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	0 1	0	0 1	0 1	0	0 1	1 0	1	0 1	1 0	1	0 1
Volume Module:												
Base Vol:	63	40	69	21	34	265	230	807	49	37	635	22
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	77	49	84	26	41	323	281	985	60	45	775	27
Added Vol:	0	0	0	14	0	78	80	294	0	0	215	9
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	77	49	84	40	41	401	361	1279	60	45	990	36
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	80	51	88	41	43	417	375	1329	62	47	1029	37
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	80	51	88	41	43	417	375	1329	62	47	1029	37
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	80	51	88	41	43	417	375	1329	62	47	1029	37
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	0.63	0.37	1.00	0.50	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1063	675	1800	855	895	1800	1700	1800	1800	1700	1800	1800
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.05	0.05	0.05	0.23	0.22	0.74	0.03	0.03	0.57	0.02
Crit Moves:		****				****		****		****		
Green/Cycle:	0.18	0.18	0.18	0.18	0.18	0.18	0.16	0.49	0.49	0.08	0.41	0.41
Volume/Cap:	0.41	0.41	0.26	0.26	0.26	1.26	1.39	1.50	0.07	0.36	1.39	0.05
Delay/Veh:	50.5	50.5	47.3	47.4	47.4	190.2	252.1	257	13.7	64.5	218	20.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	50.5	50.5	47.3	47.4	47.4	190.2	252.1	257	13.7	64.5	218	20.5
LOS by Move:	D	D	D	D	D	F	F	F	B	E	F	C
HCM2kAvgQ:	5	5	3	3	3	29	31	106	1	2	77	1

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	80	Critical Vol./Cap.(X):	0.745
Loss Time (sec):	6 (Y+R=2.0 sec)	Average Delay (sec/veh):	27.6
Optimal Cycle:	58	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	1 0	0 1	0	1 0	0 1	0	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	63	40	69	21	34	265	230	807	49	37	635	22
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	77	49	84	26	41	323	281	985	60	45	775	27
Added Vol:	0	0	0	14	0	78	80	294	0	0	215	9
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	77	49	84	40	41	401	361	1279	60	45	990	36
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	80	51	88	41	43	417	375	1329	62	47	1029	37
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	80	51	88	41	43	417	375	1329	62	47	1029	37
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.05	1.05
FinalVolume:	80	51	88	41	43	417	375	1395	65	47	1080	39
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	1.00
Lanes:	1.00	0.37	0.63	1.00	0.09	0.91	1.00	1.91	0.09	1.00	1.93	0.07
Final Sat.:	1700	661	1139	1700	169	1631	1700	3439	161	1700	3474	126
Capacity Analysis Module:												
Vol/Sat:	0.05	0.08	0.08	0.02	0.26	0.26	0.22	0.41	0.41	0.03	0.31	0.31
Crit Moves:					****			****		****		
Green/Cycle:	0.31	0.31	0.31	0.31	0.31	0.31	0.26	0.49	0.49	0.13	0.36	0.36
Volume/Cap:	0.15	0.25	0.25	0.08	0.83	0.83	0.86	0.83	0.83	0.22	0.86	0.86
Delay/Veh:	20.2	21.3	21.3	19.4	38.3	38.3	48.2	18.2	18.2	33.9	30.0	30.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.2	21.3	21.3	19.4	38.3	38.3	48.2	18.2	18.2	33.9	30.0	30.0
LOS by Move:	C	C	C	B	D	D	D	B	B	C	C	C
HCM2kAvgQ:	1	2	2	1	13	13	12	16	16	1	16	16

Note: Queue reported is the number of cars per lane.

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #104 Site Driveway #1 (NS)/ North Shore (SR-38) (EW)

****

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: B[12.0]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			0 0 1! 0 0			0 1 0 0 0			0 0 0 1 0		
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	204	0	0	200	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	0	0	0	0	0	0	0	249	0	0	244	0
Added Vol:	0	0	0	3	0	3	6	95	0	0	61	5
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	3	0	3	6	344	0	0	305	5
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	3	0	3	6	362	0	0	321	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	3	0	3	6	362	0	0	321	5
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	698	698	324	326	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	409	367	722	1245	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	408	365	722	1245	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.01	0.00	0.00	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	521	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.0	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	12.0	xxxxx	7.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			12.0			xxxxxx			xxxxxx		
ApproachLOS:	*			B			*			*		

****

Note: Queue reported is the number of cars per lane.

****

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MOON CAMP (TT 16136) TRAFFIC IMPACT ANALYSIS (JN 04409)
2010 With Project Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #105 Site Driveway #2 (NS)/ North Shore (SR-38) (EW)

****

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: B[12.1]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			0 0 1! 0 0			0 1 0 0 0			0 0 0 1 0		
Volume Module:												
Base Vol:	0	0	0	0	0	0	0	204	0	0	200	0
Growth Adj:	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Initial Bse:	0	0	0	0	0	0	0	249	0	0	244	0
Added Vol:	0	0	0	6	0	6	10	88	0	0	60	11
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	6	0	6	10	337	0	0	304	11
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	6	0	6	11	355	0	0	320	12
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	6	0	6	11	355	0	0	320	12
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	701	701	326	332	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	408	365	720	1239	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	405	362	720	1239	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.02	0.00	0.01	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	518	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	12.1	xxxxx	7.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			12.1			xxxxxx			xxxxxx		
ApproachLOS:	*			B			*			*		

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Note: Queue reported is the number of cars per lane.

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APPENDIX G

POST PROCESSING SHEETS

Project: MOONCAMP
Scenario: Year 2030 with Project (Sunday MD)

Job #: 4409
Analyst: JS
Date: 4/1/07

LOCATION: Big Bear (NS) / North Shore Drive (SR-38) (EW)
FORECAST YEAR: 2030

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		SUNDAY MD PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	IY 2010 VOLUME	GP BUILDOUT VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	275	410	135	49%	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	118	339	221	187%	0	0	0	#DIV/0!
	NB Total	393	749	356	91%	0	0	0	#DIV/0!
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	1,256	1,382	126	10%	0	0	0	#DIV/0!
	Right	354	582	228	64%	0	0	0	#DIV/0!
	EB Total	1,610	1,964	354	22%	0	0	0	#DIV/0!
WEST BOUND	Left	84	238	154	183%	0	0	0	#DIV/0!
	Through	552	607	55	10%	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	636	845	209	33%	0	0	0	#DIV/0!
TOTAL ENTERING VOLUME		2,639	3,558	919	35%	0	0	0	#DIV/0!

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		SUN MD	PM	SUN MD	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
South Leg	Inbound	749	0			
South Leg	Outbound	820	0			
South Leg	**TOTAL**	**1,569**	**0**	**8%**	**0%**	**19,000**
East Leg	Inbound	845	0			
East Leg	Outbound	1,721	0			
East Leg	**TOTAL**	**2,566**	**0**	**10%**	**0%**	**27,000**
West Leg	Inbound	1,964	0			
West Leg	Outbound	1,017	0			
West Leg	**TOTAL**	**2,981**	**0**	**9%**	**0%**	**32,200**
OVERALL TOTAL		***7,116***	**-**	**9%**	***0%***	***78,200***

S:\Carlsbad_Jobs_04400\04409\POSTPROCESSING\SUNDAY\[Big Bear_North Shore.xls]Output (3)

Project: MOONCAMP
Scenario: Year 2030 with Project (Sunday MD)

Job #: 4409
Analyst: JS
Date: 4/1/07

LOCATION: Stanfield Cutoff (NS) / North Shore Drive (SR-38) (EW)
FORECAST YEAR: 2030

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		SUNDAY MD PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	IY 2010 VOLUME	GP BUILDOUT VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	180	301	121	67%	0	0	0	#DIV/0!
	Through	5	6	1	20%	0	0	0	#DIV/0!
	Right	255	281	26	10%	0	0	0	#DIV/0!
	NB Total	440	588	148	34%	0	0	0	#DIV/0!
SOUTH BOUND	Left	10	10	0	0%	0	0	0	#DIV/0!
	Through	7	8	1	14%	0	0	0	#DIV/0!
	Right	7	16	9	129%	0	0	0	#DIV/0!
	SB Total	24	34	10	42%	0	0	0	#DIV/0!
EAST BOUND	Left	5	11	6	120%	0	0	0	#DIV/0!
	Through	138	314	176	128%	0	0	0	#DIV/0!
	Right	201	325	124	62%	0	0	0	#DIV/0!
	EB Total	344	650	306	89%	0	0	0	#DIV/0!
WEST BOUND	Left	254	279	25	10%	0	0	0	#DIV/0!
	Through	127	274	147	116%	0	0	0	#DIV/0!
	Right	7	8	1	14%	0	0	0	#DIV/0!
	WB Total	388	561	173	45%	0	0	0	#DIV/0!
TOTAL ENTERING VOLUME		1,196	1,833	637	53%	0	0	0	#DIV/0!

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		SUN MD	PM	SUN MD	PM	ADT
North Leg	Inbound	34	0			
North Leg	Outbound	25	0			
North Leg	**TOTAL**	**59**	**0**	**8%**	**0%**	**700**
South Leg	Inbound	588	0			
South Leg	Outbound	612	0			
South Leg	**TOTAL**	**1,200**	**0**	**10%**	**0%**	**12,000**
East Leg	Inbound	561	0			
East Leg	Outbound	605	0			
East Leg	**TOTAL**	**1,166**	**0**	**11%**	**0%**	**11,000**
West Leg	Inbound	650	0			
West Leg	Outbound	591	0			
West Leg	**TOTAL**	**1,241**	**0**	**8%**	**0%**	**15,000**
OVERALL TOTAL		***3,666***	***-***	**9%**	***0%***	***38,700***

S:\Carlsbad_Jobs_04400\04409\POSTPROCESSING\SUNDAY\[Stanfield_North Shore.xls]Output (3)

Project: MOON CAMP
Scenario: Year 2030 with Project (Sunday MD)

Job #: 4409
Analyst: JS
Date: 4/1/07

LOCATION: Stanfield Cutoff (NS) / Big Bear Boulevard (EW)
FORECAST YEAR: 2030

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		SUNDAY MD PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	IY 2010 VOLUME	GP BUILDOUT VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	77	85	8	10%	0	0	0	#DIV/0!
	Through	49	55	6	12%	0	0	0	#DIV/0!
	Right	84	96	12	14%	0	0	0	#DIV/0!
	NB Total	210	236	26	12%	0	0	0	#DIV/0!
SOUTH BOUND	Left	40	48	8	20%	0	0	0	#DIV/0!
	Through	41	46	5	12%	0	0	0	#DIV/0!
	Right	401	440	39	10%	0	0	0	#DIV/0!
	SB Total	482	534	52	11%	0	0	0	#DIV/0!
EAST BOUND	Left	361	397	36	10%	0	0	0	#DIV/0!
	Through	1,279	1,426	147	11%	0	0	0	#DIV/0!
	Right	60	63	3	5%	0	0	0	#DIV/0!
	EB Total	1,700	1,886	186	11%	0	0	0	#DIV/0!
WEST BOUND	Left	45	51	6	13%	0	0	0	#DIV/0!
	Through	990	1,085	95	10%	0	0	0	#DIV/0!
	Right	36	43	7	19%	0	0	0	#DIV/0!
	WB Total	1,071	1,179	108	10%	0	0	0	#DIV/0!
TOTAL ENTERING VOLUME		3,463	3,835	372	11%	0	0	0	#DIV/0!

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		SUN MD	PM	SUN MD	PM	ADT
North Leg	Inbound	534	0			
North Leg	Outbound	495	0			
North Leg	**TOTAL**	**1,029**	**0**	**8%**	**0%**	**12,300**
South Leg	Inbound	236	0			
South Leg	Outbound	160	0			
South Leg	**TOTAL**	**396**	**0**	**8%**	**0%**	**4,800**
East Leg	Inbound	1,179	0			
East Leg	Outbound	1,570	0			
East Leg	**TOTAL**	**2,749**	**0**	**8%**	**0%**	**32,700**
West Leg	Inbound	1,886	0			
West Leg	Outbound	1,610	0			
West Leg	**TOTAL**	**3,496**	**0**	**8%**	**0%**	**41,800**
OVERALL TOTAL		***7,670***	**-**	**8%**	***0%***	***91,600***

S:\Carlsbad_Jobs_04400\04409\POSTPROCESSING\SUNDAY\[Stanfield_Big Bear.xls]Output (3)

Project: MOONCAMP
Scenario: Year 2030 with Project (Friday PM)

Job #: 4409
Analyst: JS
Date: 4/1/07

LOCATION: Northshore (NS) / Big Bear Boulevard (EW)
FORECAST YEAR: 2030

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		FRI PM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	IY 2010 VOLUME	GP BUILDOUT VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	269	383	114	42%	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	39	246	207	531%	0	0	0	#DIV/0!
	NB Total	308	629	321	104%	0	0	0	#DIV/0!
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	470	544	74	16%	0	0	0	#DIV/0!
	Right	353	417	64	18%	0	0	0	#DIV/0!
	EB Total	823	961	138	17%	0	0	0	#DIV/0!
WEST BOUND	Left	110	553	443	403%	0	0	0	#DIV/0!
	Through	411	457	46	11%	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	521	1,010	489	94%	0	0	0	#DIV/0!
TOTAL ENTERING VOLUME		1,652	2,600	948	57%	0	0	0	#DIV/0!

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		FRI PM	PM	FRI PM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
South Leg	Inbound	629	0			
South Leg	Outbound	970	0			
South Leg	**TOTAL**	**1,599**	**0**	**8%**	**0%**	**19,000**
East Leg	Inbound	1,010	0			
East Leg	Outbound	790	0			
East Leg	**TOTAL**	**1,800**	**0**	**9%**	**0%**	**19,000**
West Leg	Inbound	961	0			
West Leg	Outbound	840	0			
West Leg	**TOTAL**	**1,801**	**0**	**9%**	**0%**	**21,000**
OVERALL TOTAL		***5,200***	***-***	**9%**	***0%***	***59,000***

S:\Carlsbad_Jobs_04400\04409\POSTPROCESSING\FRIDAY\[NorthShore_Big Bear.xls]Output (3)

Project: MOONCAMP
Scenario: Year 2030 with Project (Friday PM)

Job #: 4409
Analyst: JS
Date: 7/5/06

LOCATION: Stanfield Cutoff (NS) / North Shore Drive (SR-38) (EW)
FORECAST YEAR: 2030

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		FRI PM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	IY 2010 VOLUME	GP BUILDOUT VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	123	445	322	262%	0	0	0	#DIV/0!
	Through	6	11	5	83%	0	0	0	#DIV/0!
	Right	301	331	30	10%	0	0	0	#DIV/0!
	NB Total	430	787	357	83%	0	0	0	#DIV/0!
SOUTH BOUND	Left	6	8	2	33%	0	0	0	#DIV/0!
	Through	12	17	5	42%	0	0	0	#DIV/0!
	Right	1	5	4	400%	0	0	0	#DIV/0!
	SB Total	19	30	11	58%	0	0	0	#DIV/0!
EAST BOUND	Left	1	6	5	500%	0	0	0	#DIV/0!
	Through	131	438	307	234%	0	0	0	#DIV/0!
	Right	144	505	361	251%	0	0	0	#DIV/0!
	EB Total	276	949	673	244%	0	0	0	#DIV/0!
WEST BOUND	Left	307	338	31	10%	0	0	0	#DIV/0!
	Through	93	320	227	244%	0	0	0	#DIV/0!
	Right	7	12	5	71%	0	0	0	#DIV/0!
	WB Total	407	670	263	65%	0	0	0	#DIV/0!
TOTAL ENTERING VOLUME		1,132	2,436	1304	115%	0	0	0	#DIV/0!

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		FRI PM	PM	FRI PM	PM	ADT
North Leg	Inbound	30	0			
North Leg	Outbound	29	0			
North Leg	**TOTAL**	**59**	**0**	**11%**	**0%**	**550**
South Leg	Inbound	787	0			
South Leg	Outbound	860	0			
South Leg	**TOTAL**	**1,647**	**0**	**9%**	**0%**	**18,000**
East Leg	Inbound	670	0			
East Leg	Outbound	777	0			
East Leg	**TOTAL**	**1,447**	**0**	**10%**	**0%**	**15,000**
West Leg	Inbound	949	0			
West Leg	Outbound	770	0			
West Leg	**TOTAL**	**1,719**	**0**	**9%**	**0%**	**20,000**
OVERALL TOTAL		***4,872***	**-**	**9%**	***0%***	***53,550***

S:\Carlsbad_Jobs_04400\04409\POSTPROCESSING\FRIDAY\[Stanfield_North Shore.xls]Output (3)

Project: MOONCAMP
Scenario: Year 2030 with Project (Friday PM)

Job #: 4409
Analyst: JS
Date: 4/12/07

LOCATION: Stanfield Cutoff (NS) / Big Bear Boulevard (EW)
FORECAST YEAR: 2030

INDIVIDUAL TURN VOLUME GROWTH REVIEW

APPROACH	TURNING MOVEMENT	FRI PM PEAK HOUR INPUT DATA: IY 2010 VOLUME	GP BUILDOUT VOLUME	DIFF-ERENCE	% CHANGE	PM PEAK HOUR INPUT DATA: EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	74	82	8	11%	0	0	0	#DIV/0!
	Through	22	40	18	82%	0	0	0	#DIV/0!
	Right	74	82	8	11%	0	0	0	#DIV/0!
	NB Total	170	204	34	20%	0	0	0	#DIV/0!
SOUTH BOUND	Left	31	56	25	81%	0	0	0	#DIV/0!
	Through	34	67	33	97%	0	0	0	#DIV/0!
	Right	396	607	211	53%	0	0	0	#DIV/0!
	SB Total	461	730	269	58%	0	0	0	#DIV/0!
EAST BOUND	Left	436	699	263	60%	0	0	0	#DIV/0!
	Through	1,367	1,504	137	10%	0	0	0	#DIV/0!
	Right	94	103	9	10%	0	0	0	#DIV/0!
	EB Total	1,897	2,306	409	22%	0	0	0	#DIV/0!
WEST BOUND	Left	21	34	13	62%	0	0	0	#DIV/0!
	Through	1,033	1,303	270	26%	0	0	0	#DIV/0!
	Right	29	71	42	145%	0	0	0	#DIV/0!
	WB Total	1,083	1,408	325	30%	0	0	0	#DIV/0!
TOTAL ENTERING VOLUME		3,611	4,648	1037	29%	0	0	0	#DIV/0!

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES: FRI PM	PM	PERCENT OF ADT: FRI PM	PM	ADT
North Leg	Inbound	730	0			
North Leg	Outbound	810	0			
North Leg	**TOTAL**	**1,540**	**0**	**9%**	**0%**	**18,100**
South Leg	Inbound	204	0			
South Leg	Outbound	204	0			
South Leg	**TOTAL**	**408**	**0**	**10%**	**0%**	**4,200**
East Leg	Inbound	1,408	0			
East Leg	Outbound	1,642	0			
East Leg	**TOTAL**	**3,050**	**0**	**9%**	**0%**	**34,000**
West Leg	Inbound	2,306	0			
West Leg	Outbound	1,992	0			
West Leg	**TOTAL**	**4,298**	**0**	**10%**	**0%**	**45,000**
OVERALL TOTAL		***9,296***	**-**	**9%**	***0%***	***101,300***

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APPENDIX H

GENERAL PLAN BUILDOUT WITH PROJECT (2030) CONDITIONS
INTERSECTION ANALYSIS

MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

Average Delay (sec/veh): OVERFLOW Worst Case Level Of Service: F[xxxxx]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1!	0	0	0 0 0	0	0	0 0 1	0	1	1 0 1	0	0
Volume Module:												
Base Vol:	383	0	246	0 0	0	0	0 544	417		553	457	0
Growth Adj:	1.00 1.00	1.00		1.00 1.00	1.00	1.00	1.00 1.00	1.00		1.00 1.00	1.00	
Initial Bse:	383	0	246	0 0	0	0	0 544	417		553	457	0
User Adj:	1.00 1.00	1.00		1.00 1.00	1.00	1.00	1.00 1.00	1.00		1.00 1.00	1.00	
PHF Adj:	0.95 0.95	0.95		0.95 0.95	0.95	0.95	0.95 0.95	0.95		0.95 0.95	0.95	
PHF Volume:	403	0	259	0 0	0	0	0 573	439		582	481	0
Reduct Vol:	0	0	0	0 0	0	0	0 0	0		0	0	0
FinalVolume:	403	0	259	0 0	0	0	0 573	439		582	481	0
Critical Gap Module:												
Critical Gp:	4.1 xxxx	xxxxx	xxxxx	xxxx xxxx	xxxxx	xxxxx	6.5	6.2		7.1	6.5	xxxxx
FollowUpTim:	2.2 xxxx	xxxxx	xxxxx	xxxx xxxx	xxxxx	xxxxx	4.0	3.3		3.5	4.0	xxxxx
Capacity Module:												
Cnflict Vol:	0 xxxx	xxxxx	xxxx	xxxx xxxx	xxxxx	xxxx	1065	0		1222	936	xxxxx
Potent Cap.:	900 xxxx	xxxxx	xxxx	xxxx xxxx	xxxxx	xxxx	224	900		158	267	xxxxx
Move Cap.:	900 xxxx	xxxxx	xxxx	xxxx xxxx	xxxxx	xxxx	95	900		0	113	xxxxx
Volume/Cap:	0.45 xxxx	xxxx	xxxx	xxxx xxxx	xxxx	xxxx	6.04	0.49		xxxx	4.26	xxxx
Level Of Service Module:												
2Way95thQ:	2.3 xxxx	xxxxx	xxxx	xxxx xxxx	xxxxx	xxxx	63.1	2.7		xxxx	49.6	xxxxx
Control Del:	12.2 xxxx	xxxxx	xxxxx	xxxx xxxx	xxxxx	xxxxx	2355	12.7		xxxxx	1544	xxxxx
LOS by Move:	B	*	*	*	*	*	*	F		B	*	F
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx xxxx	xxxxx		xxxx xxxx	xxxxx		xxxx xxxx	xxxxx		xxxx xxxx	xxxxx	
SharedQueue:	xxxxx xxxx	xxxxx		xxxxx xxxx	xxxxx		xxxxx xxxx	xxxxx		xxxxx xxxx	xxxxx	
Shrd ConDel:	xxxxx xxxx	xxxxx		xxxxx xxxx	xxxxx		xxxxx xxxx	xxxxx		xxxxx xxxx	xxxxx	
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			1338.5			xxxxxx		
ApproachLOS:	*			*			F			F		

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

Cycle (sec): 65 Critical Vol./Cap.(X): 0.769
Loss Time (sec): 6 (Y+R=4.0 sec) Average Delay (sec/veh): 20.4
Optimal Cycle: 48 Level Of Service: C

Approach:	North Bound			South Bound			East Bound						West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Split Phase			Split Phase			Protected						Protected					
Rights:	Include			Include			Ovl						Include					
Min. Green:	17	0	17	0	0	0	0	12	12				12	12	0			
Lanes:	1	0	0	0	1	0	0	0	0	0	0	0	2	0	1	1	0	1	0	0
Volume Module:																				
Base Vol:	383	0	246	0	0	0	0	544	417				553	457	0			
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00			
Initial Bse:	383	0	246	0	0	0	0	544	417				553	457	0			
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00			
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95			
PHF Volume:	403	0	259	0	0	0	0	573	439				582	481	0			
Reduct Vol:	0	0	0	0	0	0	0	0	0				0	0	0			
Reduced Vol:	403	0	259	0	0	0	0	573	439				582	481	0			
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00			
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00			
FinalVolume:	403	0	259	0	0	0	0	573	439				582	481	0			
Saturation Flow Module:																		
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900				1900	1900	1900			
Adjustment:	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00				0.95	1.00	1.00			
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	2.00	1.00				1.00	1.00	0.00			
Final Sat.:	1800	0	1900	0	0	0	0	3800	1900				1800	1900	0			
Capacity Analysis Module:																		
Vol/Sat:	0.22	0.00	0.14	0.00	0.00	0.00	0.00	0.15	0.23				0.32	0.25	0.00			
Crit Moves:	****							****					****					
Green/Cycle:	0.29	0.00	0.29	0.00	0.00	0.00	0.00	0.20	0.49				0.42	0.62	0.00			
Volume/Cap:	0.77	0.00	0.47	0.00	0.00	0.00	0.00	0.77	0.47				0.77	0.41	0.00			
Delay/Veh:	31.3	0.0	21.6	0.0	0.0	0.0	0.0	32.2	10.5				21.5	4.5	0.0			
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00			
AdjDel/Veh:	31.3	0.0	21.6	0.0	0.0	0.0	0.0	32.2	10.5				21.5	4.5	0.0			
LOS by Move:	C	A	C	A	A	A	A	C	B				C	A	A			
HCM2kAvgQ:	10	0	4	0	0	0	0	7	5				12	3	0			

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

Average Delay (sec/veh): 7869.9 Worst Case Level Of Service: F[24333.0]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1!	0	0	0 0 1!	0	0	0 1	0	1 0	0 0 1!	0	0
Volume Module:												
Base Vol:	445	11	331	8	17	5	6	438	505	338	320	12
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	445	11	331	8	17	5	6	438	505	338	320	12
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	468	12	348	8	18	5	6	461	532	356	337	13
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	468	12	348	8	18	5	6	461	532	356	337	13
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1806	1801	496	1304	2060	343	349	xxxx	xxxxx	993	xxxx	xxxxx
Potent Cap.:	62	81	578	139	56	704	1221	xxxx	xxxxx	705	xxxx	xxxxx
Move Cap.:	9	30	578	20	20	704	1221	xxxx	xxxxx	705	xxxx	xxxxx
Volume/Cap:	53.02	0.39	0.60	0.42	0.87	0.01	0.01	xxxx	xxxx	0.50	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	2.9	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.0	xxxx	xxxxx	15.2	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	C	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	15	xxxxx	xxxx	24	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	105	xxxxx	xxxxx	3.9	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	527	xxxxx	8.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	F	*	*	F	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			526.9			xxxxxx			xxxxxx		
ApproachLOS:	F			F			*			*		

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

****

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

****

Cycle (sec):	65	Critical Vol./Cap.(X):	0.724
Loss Time (sec):	8 (Y+R=4.0 sec)	Average Delay (sec/veh):	34.2
Optimal Cycle:	52	Level Of Service:	C

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ovl			Include		
Min. Green:	10	12	12	10	12	12	10	12	12	10	12	12
Lanes:	2 0	0 1	0	1 0	0 1	0	1 0	1 0	1	1 0	0 1	0
Volume Module:												
Base Vol:	445	11	331	8	17	5	6	438	505	338	320	12
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	445	11	331	8	17	5	6	438	505	338	320	12
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	468	12	348	8	18	5	6	461	532	356	337	13
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	468	12	348	8	18	5	6	461	532	356	337	13
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	468	12	348	8	18	5	6	461	532	356	337	13
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.89	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Lanes:	2.00	0.03	0.97	1.00	0.77	0.23	1.00	1.00	1.00	1.00	0.96	0.04
Final Sat.:	3378	61	1839	1800	1468	432	1800	1900	1900	1800	1831	69
Capacity Analysis Module:												
Vol/Sat:	0.14	0.19	0.19	0.00	0.01	0.01	0.00	0.24	0.28	0.20	0.18	0.18
Crit Moves:		****		****				****		****		
Green/Cycle:	0.17	0.22	0.22	0.15	0.20	0.20	0.23	0.28	0.45	0.23	0.28	0.28
Volume/Cap:	0.82	0.87	0.87	0.03	0.06	0.06	0.02	0.87	0.63	0.87	0.67	0.67
Delay/Veh:	38.6	46.0	46.0	23.6	21.2	21.2	19.4	39.9	15.0	45.9	27.5	27.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	38.6	46.0	46.0	23.6	21.2	21.2	19.4	39.9	15.0	45.9	27.5	27.5
LOS by Move:	D	D	D	C	C	C	B	D	B	D	C	C
HCM2kAvgQ:	8	10	10	0	0	0	0	12	8	11	7	7

****

Note: Queue reported is the number of cars per lane.

****

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	180	Critical Vol./Cap.(X):	1.579
Loss Time (sec):	8 (Y+R=2.0 sec)	Average Delay (sec/veh):	303.8
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	0 1	0	0 1	0 1	0	0 1	1 0	1	0 1	1 0	1	0 1
Volume Module:												
Base Vol:	82	40	82	56	67	607	699	1504	103	34	1303	71
Growth Adj:	1.00 1.00	1.00		1.00 1.00	1.00		1.00 1.00	1.00		1.00 1.00	1.00	
Initial Bse:	82	40	82	56	67	607	699	1504	103	34	1303	71
User Adj:	1.00 1.00	1.00		1.00 1.00	1.00		1.00 1.00	1.00		1.00 1.00	1.00	
PHF Adj:	0.97 0.97	0.97		0.97 0.97	0.97		0.97 0.97	0.97		0.97 0.97	0.97	
PHF Volume:	85	41	85	58	69	627	722	1554	106	35	1346	73
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	85	41	85	58	69	627	722	1554	106	35	1346	73
PCE Adj:	1.00 1.00	1.00		1.00 1.00	1.00		1.00 1.00	1.00		1.00 1.00	1.00	
MLF Adj:	1.00 1.00	1.00		1.00 1.00	1.00		1.00 1.00	1.00		1.00 1.00	1.00	
FinalVolume:	85	41	85	58	69	627	722	1554	106	35	1346	73
Saturation Flow Module:												
Sat/Lane:	1900 1900	1900		1900 1900	1900		1900 1900	1900		1900 1900	1900	
Adjustment:	0.95 1.00	1.00		0.95 1.00	1.00		0.95 1.00	1.00		0.95 1.00	1.00	
Lanes:	0.68 0.32	1.00		0.47 0.53	1.00		1.00 1.00	1.00		1.00 1.00	1.00	
Final Sat.:	1231 601	1900		844 1009	1900		1800 1900	1900		1800 1900	1900	
Capacity Analysis Module:												
Vol/Sat:	0.07 0.07	0.04		0.07 0.07	0.33		0.40 0.82	0.06		0.02 0.71	0.04	
Crit Moves:	****				****		****				****	
Green/Cycle:	0.13 0.13	0.13		0.19 0.19	0.19		0.23 0.58	0.58		0.06 0.40	0.40	
Volume/Cap:	0.52 0.52	0.33		0.36 0.36	1.75		1.75 1.41	0.10		0.35 1.75	0.10	
Delay/Veh:	80.2 80.2	74.3		66.5 66.5	422.3		417.2 216	10.8		91.3 391	29.8	
User DelAdj:	1.00 1.00	1.00		1.00 1.00	1.00		1.00 1.00	1.00		1.00 1.00	1.00	
AdjDel/Veh:	80.2 80.2	74.3		66.5 66.5	422.3		417.2 216	10.8		91.3 391	29.8	
LOS by Move:	F	F	E	E	E	F	F	F	B	F	F	C
HCM2kAvgQ:	7	7	4	6	6	67	81	138	1	2	142	2

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	120	Critical Vol./Cap.(X):	0.865
Loss Time (sec):	6 (Y+R=2.0 sec)	Average Delay (sec/veh):	31.7
Optimal Cycle:	81	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound				West Bound			
Movement:	L	T	R	L	T	R	L	T	R		L	T	R	
Control:	Permitted			Permitted			Protected				Protected			
Rights:	Include			Ovl			Include				Include			
Min. Green:	10	20	20	10	20	20	14	14	14		14	14	14	
Lanes:	1 0	0 1	0	1 0	1 0	1	1 0	1	1 0		1 0	2 0	1	
Volume Module:														
Base Vol:	82	40	82	56	67	607	699	1504	103		34	1303	71	
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	82	40	82	56	67	607	699	1504	103		34	1303	71	
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97		0.97	0.97	0.97	
PHF Volume:	85	41	85	58	69	627	722	1554	106		35	1346	73	
Reduct Vol:	0	0	0	0	0	0	0	0	0		0	0	0	
Reduced Vol:	85	41	85	58	69	627	722	1554	106		35	1346	73	
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	85	41	85	58	69	627	722	1554	106		35	1346	73	
Saturation Flow Module:														
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900		1900	1900	1900	
Adjustment:	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Lanes:	1.00	0.33	0.67	1.00	1.00	1.00	1.00	1.87	0.13		1.00	2.00	1.00	
Final Sat.:	1800	623	1277	1800	1900	1900	1800	3556	244		1800	3800	1900	
Capacity Analysis Module:														
Vol/Sat:	0.05	0.07	0.07	0.03	0.04	0.33	0.40	0.44	0.44		0.02	0.35	0.04	
Crit Moves:		****					****					****		
Green/Cycle:	0.17	0.17	0.17	0.17	0.17	0.58	0.42	0.62	0.62		0.17	0.37	0.37	
Volume/Cap:	0.28	0.40	0.40	0.19	0.22	0.57	0.96	0.71	0.71		0.12	0.96	0.11	
Delay/Veh:	46.1	48.3	48.3	44.5	44.8	11.7	55.2	10.0	10.0		43.5	51.4	23.5	
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
AdjDel/Veh:	46.1	48.3	48.3	44.5	44.8	11.7	55.2	10.0	10.0		43.5	51.4	23.5	
LOS by Move:	D	D	D	D	D	B	E	B	B		D	D	C	
HCM2kAvgQ:	3	4	4	2	2	10	32	14	14		1	29	1	

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #104 Site Driveway #1 (NS)/ North Shore (SR-38) (EW)

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: E[39.5]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			1 0 0 0 1			0 1 0 0 0			0 0 0 1 0		
Volume Module:												
Base Vol:	0	0	0	5	0	2	3	949	0	0	770	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	5	0	2	3	949	0	0	770	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	5	0	2	3	999	0	0	811	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	5	0	2	3	999	0	0	811	8
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1820	xxxx	815	819	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	86	xxxx	381	818	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	86	xxxx	381	818	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.06	xxxx	0.01	0.00	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.2	xxxx	0.0	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	49.5	xxxx	14.5	9.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	E	*	B	A	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			39.5			xxxxxx			xxxxxx		
ApproachLOS:	*			E			*			*		

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #104 Site Driveway #1 (NS)/ North Shore (SR-38) (EW)

****

Average Delay (sec/veh): 0.1 Worst Case Level Of Service: C[23.1]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0	0 0		0 0 1!	0 0		1 0 2	0 0		0 0 0	1 0	
Volume Module:												
Base Vol:	0	0	0	5	0	2	3	949	0	0	770	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	5	0	2	3	949	0	0	770	8
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	5	0	2	3	949	0	0	770	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	5	0	2	3	999	0	0	811	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	5	0	2	3	999	0	0	811	8
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1321	1820	815	819	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	175	78	381	818	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	174	78	381	818	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.03	0.00	0.01	0.00	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	206	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	23.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	C	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			23.1			xxxxxx			xxxxxx		
ApproachLOS:	*			C			*			*		

****

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #105 Site Driveway #2 (NS)/ North Shore (SR-38) (EW)

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: E[41.9]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	0	0 0	0 0	1! 0	0	0 1	0	0 0	0 0	0	1 0
Volume Module:												
Base Vol:	0	0	0	9	0	4	6	949	0	0	770	14
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	9	0	4	6	949	0	0	770	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	9	0	4	6	999	0	0	811	15
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	9	0	4	6	999	0	0	811	15
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1829	1829	818	825	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	85	77	379	814	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	85	77	379	814	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.11	0.00	0.01	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	111	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.4	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	41.9	xxxxx	9.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	E	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			41.9			xxxxxx			xxxxxx		
ApproachLOS:	*			E			*			*		

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions With Improvements
FRIDAY PM PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #105 Site Driveway #2 (NS)/ North Shore (SR-38) (EW)

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: C[23.6]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0	0 0	0	0 0	1! 0	0	1 0	2 0	0	0 0	0 1	0
Volume Module:												
Base Vol:	0	0	0	9	0	4	6	949	0	0	770	5
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	9	0	4	6	949	0	0	770	5
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	9	0	4	6	949	0	0	770	5
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	9	0	4	6	999	0	0	811	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	9	0	4	6	999	0	0	811	5
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1325	1825	813	816	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	173	78	381	821	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	172	77	381	821	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.05	0.00	0.01	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	207	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.2	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	23.6	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	C	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			23.6			xxxxxx			xxxxxx		
ApproachLOS:	*			C			*			*		

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

****

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

****

Average Delay (sec/veh): OVERFLOW Worst Case Level Of Service: F[xxxxx]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1!	0 0		0 0 0	0 0		0 0 1	0 1		1 0	1 0	0
Volume Module:												
Base Vol:	410	0	339	0	0	0	0	1382	582	238	607	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	410	0	339	0	0	0	0	1382	582	238	607	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	432	0	357	0	0	0	0	1455	613	251	639	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	432	0	357	0	0	0	0	1455	613	251	639	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	6.5	6.2	7.1	6.5	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.0	3.3	3.5	4.0	xxxxx
Capacity Module:												
Cnflict Vol:	0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	1220	0	1769	1042	xxxxx
Potent Cap.:	900	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	182	900	66	232	xxxxx
Move Cap.:	900	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	67	900	0	86	xxxxx
Volume/Cap:	0.48	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	21.69	0.68	xxxx	7.47	xxxx
Level Of Service Module:												
2Way95thQ:	2.6	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	177	5.5	xxxx	72.5	xxxxx
Control Del:	12.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	9426	17.1	xxxxx	3007	xxxxx
LOS by Move:	B	*	*	*	*	*	*	F	C	*	F	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			6637.8			xxxxxx		
ApproachLOS:	*			*			F			F		

****

Note: Queue reported is the number of cars per lane.

****

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #101 Big Bear Blvd (NS)/ North Shore (SR-38) (EW)

Cycle (sec):	65	Critical Vol./Cap.(X):	0.839
Loss Time (sec):	6 (Y+R=4.0 sec)	Average Delay (sec/veh):	18.6
Optimal Cycle:	60	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Ovl			Include		
Min. Green:	17	0	17	0	0	0	0	12	12	12	12	0
Lanes:	1 0	0	0 1	0	0 0	0 0	0	0 2	0 1	1	0 1	0 0
Volume Module:												
Base Vol:	410	0	339	0	0	0	0	1382	582	238	607	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	410	0	339	0	0	0	0	1382	582	238	607	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	432	0	357	0	0	0	0	1455	613	251	639	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	432	0	357	0	0	0	0	1455	613	251	639	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	432	0	357	0	0	0	0	1455	613	251	639	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	2.00	1.00	1.00	1.00	0.00
Final Sat.:	1800	0	1900	0	0	0	0	3800	1900	1800	1900	0
Capacity Analysis Module:												
Vol/Sat:	0.24	0.00	0.19	0.00	0.00	0.00	0.00	0.38	0.32	0.14	0.34	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.28	0.00	0.28	0.00	0.00	0.00	0.00	0.44	0.72	0.18	0.63	0.00
Volume/Cap:	0.86	0.00	0.67	0.00	0.00	0.00	0.00	0.86	0.45	0.75	0.53	0.00
Delay/Veh:	39.7	0.0	27.6	0.0	0.0	0.0	0.0	19.7	1.6	39.8	5.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.7	0.0	27.6	0.0	0.0	0.0	0.0	19.7	1.6	39.8	5.1	0.0
LOS by Move:	D	A	C	A	A	A	A	B	A	D	A	A
HCM2kAvgQ:	12	0	7	0	0	0	0	16	1	7	5	0

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

****

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

****

Average Delay (sec/veh): 583.9 Worst Case Level Of Service: F[1812.4]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1!	0	0	0 0 1!	0	0	0 1	0	1 0	0 0 1!	0	0
Volume Module:												
Base Vol:	301	6	281	10	8	16	11	314	325	279	274	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	301	6	281	10	8	16	11	314	325	279	274	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	317	6	296	11	8	17	12	331	342	294	288	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	317	6	296	11	8	17	12	331	342	294	288	8
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1417	1409	336	1072	1576	293	297	xxxx	xxxxx	673	xxxx	xxxxx
Potent Cap.:	116	140	710	200	111	751	1276	xxxx	xxxxx	928	xxxx	xxxxx
Move Cap.:	72	86	710	77	68	751	1276	xxxx	xxxxx	928	xxxx	xxxxx
Volume/Cap:	4.39	0.07	0.42	0.14	0.12	0.02	0.01	xxxx	xxxx	0.32	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	1.4	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.8	xxxx	xxxxx	10.7	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	B	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	127	xxxxx	xxxx	127	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	65.1	xxxxx	xxxxx	1.1	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	1812	xxxxx	xxxxx	44.1	xxxxx	7.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	F	*	*	E	*	A	*	*	*	*	*
ApproachDel:	1812.4			44.1			xxxxxx			xxxxxx		
ApproachLOS:	F			E			*			*		

****

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #102 Stanfield Cut Off (NS) / North Shore Dr. (EW)

Cycle (sec):	65	Critical Vol./Cap.(X):	0.572
Loss Time (sec):	8 (Y+R=4.0 sec)	Average Delay (sec/veh):	26.0
Optimal Cycle:	52	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ovl			Include		
Min. Green:	10	12	12	10	12	12	10	12	12	10	12	12
Lanes:	2 0	0 1	0	1 0	0 1	0	1 0	1 0	1	1 0	0 1	0
Volume Module:												
Base Vol:	301	6	281	10	8	16	11	314	325	279	274	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	301	6	281	10	8	16	11	314	325	279	274	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	317	6	296	11	8	17	12	331	342	294	288	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	317	6	296	11	8	17	12	331	342	294	288	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	317	6	296	11	8	17	12	331	342	294	288	8
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.89	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Lanes:	2.00	0.02	0.98	1.00	0.33	0.67	1.00	1.00	1.00	1.00	0.97	0.03
Final Sat.:	3378	40	1860	1800	633	1267	1800	1900	1900	1800	1846	54
Capacity Analysis Module:												
Vol/Sat:	0.09	0.16	0.16	0.01	0.01	0.01	0.01	0.17	0.18	0.16	0.16	0.16
Crit Moves:		****		****				****		****		
Green/Cycle:	0.18	0.23	0.23	0.15	0.21	0.21	0.22	0.25	0.43	0.24	0.27	0.27
Volume/Cap:	0.54	0.69	0.69	0.04	0.06	0.06	0.03	0.69	0.42	0.69	0.58	0.58
Delay/Veh:	27.8	31.2	31.2	23.7	20.8	20.8	19.9	29.7	12.7	31.2	25.5	25.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.8	31.2	31.2	23.7	20.8	20.8	19.9	29.7	12.7	31.2	25.5	25.5
LOS by Move:	C	C	C	C	C	C	B	C	B	C	C	C
HCM2kAvgQ:	4	7	7	0	0	0	0	7	4	7	6	6

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	180	Critical Vol./Cap.(X):	1.182
Loss Time (sec):	8 (Y+R=2.0 sec)	Average Delay (sec/veh):	175.0
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	24	24	24	24	24	24	10	18	18	10	18	18
Lanes:	0 1	0 0	1	0 1	0 0	1	1 0	1 0	1	1 0	1 0	1
Volume Module:												
Base Vol:	85	55	96	48	46	440	397	1426	63	51	1085	43
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	85	55	96	48	46	440	397	1426	63	51	1085	43
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	88	57	100	50	48	457	413	1482	65	53	1128	45
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	88	57	100	50	48	457	413	1482	65	53	1128	45
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	88	57	100	50	48	457	413	1482	65	53	1128	45
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Lanes:	0.62	0.38	1.00	0.52	0.48	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1116	722	1900	943	904	1900	1800	1900	1900	1800	1900	1900
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.05	0.05	0.05	0.24	0.23	0.78	0.03	0.03	0.59	0.02
Crit Moves:		****				****		****		****		
Green/Cycle:	0.13	0.13	0.13	0.18	0.18	0.18	0.18	0.59	0.59	0.06	0.46	0.46
Volume/Cap:	0.59	0.59	0.39	0.29	0.29	1.33	1.28	1.33	0.06	0.53	1.28	0.05
Delay/Veh:	83.6	83.6	75.9	66.0	66.0	241.7	222.9	178	9.8	101.4	176	21.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	83.6	83.6	75.9	66.0	66.0	241.7	222.9	178	9.8	101.4	176	21.9
LOS by Move:	F	F	E	E	E	F	F	F	A	F	F	C
HCM2kAvgQ:	8	8	5	5	5	40	37	124	1	4	91	1

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #103 Stanfield Cut Off (NS) / Big Bear Blvd. (SR-18) (EW)

Cycle (sec):	120	Critical Vol./Cap.(X):	0.641
Loss Time (sec):	6 (Y+R=2.0 sec)	Average Delay (sec/veh):	21.5
Optimal Cycle:	54	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	10	20	20	10	20	20	14	14	14	14	14	14
Lanes:	1 0	0 1	0	1 0	1 0	1	1 0	1 1	0	1 0	2 0	1
Volume Module:												
Base Vol:	85	55	96	48	46	440	397	1426	63	51	1085	43
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	85	55	96	48	46	440	397	1426	63	51	1085	43
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	88	57	100	50	48	457	413	1482	65	53	1128	45
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	88	57	100	50	48	457	413	1482	65	53	1128	45
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	88	57	100	50	48	457	413	1482	65	53	1128	45
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Lanes:	1.00	0.36	0.64	1.00	1.00	1.00	1.00	1.92	0.08	1.00	2.00	1.00
Final Sat.:	1800	692	1208	1800	1900	1900	1800	3639	161	1800	3800	1900
Capacity Analysis Module:												
Vol/Sat:	0.05	0.08	0.08	0.03	0.03	0.24	0.23	0.41	0.41	0.03	0.30	0.02
Crit Moves:		****					****				****	
Green/Cycle:	0.17	0.17	0.17	0.17	0.17	0.51	0.34	0.61	0.61	0.17	0.44	0.44
Volume/Cap:	0.29	0.50	0.50	0.17	0.15	0.47	0.67	0.67	0.67	0.17	0.67	0.05
Delay/Veh:	46.3	50.9	50.9	44.0	43.8	16.1	37.9	10.1	10.1	43.3	24.7	16.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	46.3	50.9	50.9	44.0	43.8	16.1	37.9	10.1	10.1	43.3	24.7	16.3
LOS by Move:	D	D	D	D	D	B	D	B	B	D	C	B
HCM2kAvgQ:	3	6	6	2	1	8	13	13	13	2	15	1

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

****

Intersection #104 Site Driveway #1 (NS)/ North Shore (SR-38) (EW)

****

Average Delay (sec/veh): 0.1 Worst Case Level Of Service: C[18.2]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			1 0 0 0 1			0 1 0 0 0			0 0 0 1 0		
Volume Module:												
Base Vol:	0	0	0	3	0	3	6	650	0	0	591	5
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	3	0	3	6	650	0	0	591	5
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	3	0	3	6	650	0	0	591	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	3	0	3	6	650	0	0	591	5
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1256	xxxx	594	596	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	191	xxxx	509	990	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	190	xxxx	509	990	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.02	xxxx	0.01	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.0	xxxx	0.0	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	24.2	xxxx	12.1	8.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	C	*	B	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			18.2			xxxxxx			xxxxxx		
ApproachLOS:	*			C			*			*		

****

Note: Queue reported is the number of cars per lane.

****

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #104 Site Driveway #1 (NS)/ North Shore (SR-38) (EW)

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: C[15.7]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0	0 0	0	0 0	1! 0	0	1 0	2 0	0	0 0	0 1	0
Volume Module:												
Base Vol:	0	0	0	6	0	6	10	650	0	0	591	11
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	6	0	6	10	650	0	0	591	11
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	6	0	6	10	650	0	0	591	11
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	6	0	6	11	684	0	0	622	12
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	6	0	6	11	684	0	0	622	12
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	991	1333	628	634	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	275	155	487	959	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	273	154	487	959	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.02	0.00	0.01	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	350	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	15.7	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	C	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			15.7			xxxxxx			xxxxxx		
ApproachLOS:	*			C			*			*		

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #105 Site Driveway #2 (NS)/ North Shore (SR-38) (EW)

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: C[18.8]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			0 0 1! 0 0			0 1 0 0 0			0 0 0 1 0		
Volume Module:												
Base Vol:	0	0	0	6	0	6	10	650	0	0	591	11
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	6	0	6	10	650	0	0	591	11
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	6	0	6	10	650	0	0	591	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	6	0	6	10	650	0	0	591	11
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1267	1267	597	602	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	188	170	507	985	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	187	169	507	985	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.03	0.00	0.01	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	273	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	18.8	xxxxx	8.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	C	*	A	*	*	*	*	*
ApproachDel:	xxxxxx			18.8			xxxxxx			xxxxxx		
ApproachLOS:	*			C			*			*		

Note: Queue reported is the number of cars per lane.

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MOONCAMP TRAFFIC IMPACT ANALYSIS (JN 04409)
General Plan Buildout Conditions With Improvements
SUNDAY MID-DAY PEAK HOUR

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #105 Site Driveway #2 (NS)/ North Shore (SR-38) (EW)

****

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: C[15.7]

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0	0 0	0	0 0	1! 0	0	1 0	2 0	0	0 0	0 1	0
Volume Module:												
Base Vol:	0	0	0	6	0	6	10	650	0	0	591	11
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	6	0	6	10	650	0	0	591	11
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	6	0	6	10	650	0	0	591	11
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	0	0	6	0	6	11	684	0	0	622	12
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	6	0	6	11	684	0	0	622	12
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	991	1333	628	634	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	275	155	487	959	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	273	154	487	959	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.02	0.00	0.01	0.01	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	350	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	15.7	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	C	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			15.7			xxxxxx			xxxxxx		
ApproachLOS:	*			C			*			*		

****

Note: Queue reported is the number of cars per lane.

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APPENDIX I

COST ESTIMATE FOR ROADWAY IMPROVEMENTS

Local Interchange Improvements CONT...		
2.	Reconstruct Existing Interchange	
	Realign and widen existing ramps (to 2 lanes)	$750,000/Each Ramp
	Construct Loop on – ramps (Does not include realigning existing ramp)	$700,000/Each Ramp
	Upgrade existing Diamond IC to Partial – Cloverleaf	$6,000,000
3.	Improve Existing Interchange	
	Widen ramps (From one to two lanes)	$350,000/Each Ramp
	Widen existing OC structure	$110/Sq. Ft.
	Signalize ramp intersection	$90,000/Location
	Upgrade existing signal at ramp terminal	$75,000/Intersection
	Upgrade existing signal at ramp terminal (Add lights only)	$25,000/Each
4.	Ramp Metering System	$60,000/Each location
Intersection Improvements		
1.	Signalization of local intersection (with some roadwork)	$250,000
2.	Upgrade existing intersection signalization	$75,000
3.	Upgrade existing Traffic Controller/Assembles	$40,000/Each
4.	Install new signal	$90,000/location
5.	Add signal heads	$25,000/Intersection
6.	Construct left – turn lane (240' long)	$50,000/Each Location
7.	Street widening (12' wide) (Pavement only)	$180,000/Mile
8.	Curb and gutter (Type A2-8)	$15/LF

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Appendix F:
Applicable Fire Code Requirements

CHAPTER 82.13 FIRE SAFETY (FS) OVERLAY

Sections:

82.13.010 Purpose
82.13.020 Location Requirements
82.13.030 Fire Safety Areas
82.13.040 Application Requirements
82.13.050 General Development Standards
82.13.060 FS1, FS2, and FS3 Development Standards
82.13.070 FS1 Additional Development Standards
82.13.080 Soil Erosion and Sediment Control Plans/Permits
82.13.090 Alternate Hazard Protection Measures

82.13.010 Purpose

The Fire Safety (FS) Overlay established by Sections 82.01.020 (Land Use Plan and Land Use Zoning Districts) and 82.01.030 (Overlays) is created to provide greater public safety in areas prone to wildland brush fires, by establishing additional development standards for these areas.

Adopted 4011 (2007)

82.13.020 Location Requirements

The FS Overlay shall be designated in high fire hazard areas as mapped on the General Plan Hazards Maps with the locations derived from the California Department of Forestry, U.S. Forest Service, and the County Fire Department.

Adopted 4011 (2007)

82.13.030 Fire Safety Areas

The FS Overlay is divided into three fire safety areas to correspond to distinct geographic areas and the associated wildland fire hazard. The requirements applicable to each fire safety area are found in Section 82.13.050 (General Development Standards), Section 82.13.060 (FS1, FS2, and FS3 Development Standards), and 82.13.070 (FS1 Additional Development Standards).

(a) Fire Safety Area 1 (FS1). Fire Safety Area 1 (FS1) includes areas within the mountains and valley foothills. It includes all the land generally within the San Bernardino National Forest boundary and is characterized by areas with moderate and steep terrain and moderate to heavy fuel loading contributing to high fire hazard conditions.

(b) Fire Safety Area 2 (FS2). Fire Safety Area 2 (FS2) includes those lands just to the north and east of the mountain FS1 area in the mountain-desert interface. These areas have gentle to moderate sloping terrain and contain light to moderate fuel loading. These areas

are periodically subject to high wind conditions that have the potential of dramatically spreading wildland fires.

(c) Fire Safety Area 3 (FS3). Fire Safety Area 3 (FS3) includes lands just to the south of the mountain FS1 area. These lands are primarily within the wildland-urban interface of the Valley Region and consist of varying terrain from relatively flat to steeply sloping hillside areas. Present and future development within FS3 is exposed to the impacts of wildland fires and other natural hazards primarily due to its proximity to FS1. These areas are subject to Santa Ana wind conditions that have the potential of dramatically spreading wildland fires during extreme fire behavior conditions.

Adopted 4011 (2007)

82.13.040 Application Requirements

(a) Notice of application or permit. A notice of each land use application and/or development permit that would lead to the construction of one or more structures or the subdivision of land within the FS Overlay shall be filed with the responsible Fire Authority by the Department.

(b) Review authorities. Each proposed land use application that would lead to the construction or expansion of a structure or the subdivision of land shall be submitted to the responsible fire authority and the appropriate Natural Resource Conservation Service Office for review and recommendation. Any recommendations received shall be indicated in any staff report and/or presentation for the proposed development and shall be incorporated into project conditions of approval where possible.

(c) Pre-application conference. Every development project application submitted to the Department shall be reviewed by Department staff through a pre-application conference with the project proponent before the acceptance of the application for filing.

(d) Density bonus. A residential density bonus, if any, shall only be allowed through the approval of a Planned Development Permit in compliance with Chapter 85.10 (Planned Development Permits).

(e) Subdivisions. When 25 percent or more of a subdivision project site involving five or more lots is located on natural slopes greater than 30 percent, the subdivision application shall be submitted concurrently with a Planned Development application to evaluate appropriate project design in consideration of topographic limitations of the site. This provision shall not apply if all of the areas on the site with natural ungraded slopes over 30 percent are permanently restricted from structural development.

(f) Application requirements. Each land use and other project application shall include the following information and materials, in addition to what is required by Section 85.03.060 (Application Forms and Information Packets).

(1) Slope analysis. Each project application shall include a slope analysis. The slope analysis shall include the following information:

(A) A topographic map of the proposed project area and all adjoining properties within 150 feet at a scale of not less than one-inch to 200 feet. The contour interval shall not be more than two feet except that the contour interval may be five feet if the general natural ungraded slope is more than 10 percent. Contour lines shall be obtained by aerial or field survey, done under the supervision of a licensed Land Surveyor or Registered Engineer.

(B) The natural, ungraded, slope categories to be computed are zero percent to less than 15 percent, 15 percent to less than 30 percent, and 30 percent or greater. The minimum area (polygon) used for slope calculation shall be 5,000 square feet.

(C) The area, in acres, shall be tabulated for each category.

(2) Preliminary grading plan. Each project application shall include a preliminary grading plan, except that preliminary grading plan requirements may be waived by the Director if it is determined through the required preapplication conference that this requirement is unnecessary due to site specific soils, topographic or other physical conditions, or due to the specific design of the project. The preliminary grading plan shall include the following information.

(A) A topographic map of the proposed project area and all adjoining properties within 150 feet at a scale of not less than one inch to 200 feet. The contour interval shall not be more than two feet except that the contour interval may be five feet if the natural ungraded slope is more than 10 percent. Contour lines shall be obtained by aerial or field survey, done under the supervision of a licensed Land Surveyor or Registered Engineer.

(B) Contours of the finished graded slope shown at intervals similar to that on the topographic base map.

(C) Street grades, slope ratios, flow lines, pad elevations, maximum elevation of top and minimum elevation of toe of finished slopes over five feet in vertical height, the maximum heights of those slopes and approximate total cubic yards of cut and fill shown on the preliminary grading plan.

(D) Compliance with the current edition of the California Building Code, as adopted by the County, is required.

(E) In the event no grading is proposed, a statement to that effect shall be placed on the required topographic map described in Subsection (f)1.a, above, and the map shall delineate the boundary of an adequately sized building pad, driveway and septic system (if proposed) for each proposed parcel.

(3) Fuel modification plan. Each project application shall include a fuel modification plan describing the fuel modification area required in Subsection 82.15.060.(b) 6, below. The plan may be submitted as a preliminary and final plan. A preliminary and/or final plan shall be submitted concurrently with the development application to the Department for review in conjunction with the project design review. Final plans shall be reviewed and approved by the responsible Fire Authority in conjunction with the County Fire Marshall. The fuel modification plan shall address the standards in Subsection 82.15.060.(b) 6, below, and the following factors:

(A) The natural ungraded slope of the land within the project and in the areas adjacent to the project;

(B) Fuel loading;

(C) Access to the project and access directly to the fuel modified area;

(D) The on-site availability of water that can be used for fire fighting purposes;

(E) The continual maintenance of the fuel modified areas;

(F) The soil erosion and sediment control measures to alleviate permanent scarring and accelerated erosion; and

(G) A list of recommended landscape plant materials that are fire resistant.

Adopted 4011 (2007)

82.13.050 General Development Standards

Each proposed development shall comply with all applicable requirements of this Chapter, as follows.

(a) All phases. The requirements of this Chapter shall apply to all phases of a development project.

(b) Fire Authority standards. All proposed development shall comply with all other applicable standards required by the responsible Fire Authority.

(c) Applicability of land use zoning district standards and overlay standards. The development standards established by a land use zoning district and any applicable overlay shall apply, except as modified by this Chapter.

(d) Additions, alterations, enlargements, or reconstructions. Any addition, alteration, enlargement or reconstruction of a structure shall comply with the provisions of this Chapter. When an addition, alteration, enlargement or reconstruction of a structure equals or exceeds 50 percent of the existing structure, or 25 percent of the roof for roofing requirements only, the provisions of Section 82.13.060(c) (FS1, FS2, and FS3 Development Standards - Building separation standards), Section 82.13.060(d) (FS1, FS2, and FS3 Development Standards - Building construction requirements), and Section 82.13.070 (FS1 Additional Development Standards) regarding construction requirements shall apply to the entire structure and/or the whole roof as applicable. The structures and/or roofs shall be entirely retrofitted to comply with the requirements of this Chapter.

Adopted 4011 (2007)

82.13.060 FS1, FS2, and FS3 Development Standards

Development proposed in the FS1, FS2, or FS3 Overlays shall comply with all applicable requirements of this Section. Development proposed in the FS1 Overlay shall also comply with the requirements of Section 82.13.070 (FS1 Additional Development Standards).

(a) Residential density. In order to reduce fire hazards, prevent erosion, and to preserve the existing vegetation and visual quality, the density of development for any Tentative Parcel Map or Tentative Tract Map in sloping hillside areas shall be in compliance with the following criteria:

(1) One to four dwelling units per gross acre on slopes of zero to less than fifteen percent (0-<15%);

(2) Two dwelling units per gross acre on slopes of 15 to less than 30 percent (15-<30%);

(3) One dwelling unit per three gross acres on slopes of greater than 30 percent gradient;

(4) In the Rancho Cucamonga Sphere of Influence, zero density is allowed for any portion of a proposed Tentative Parcel Map or Tentative Tract Map on slopes of greater than 30 percent gradient.

(b) Site development requirements.

(1) Site and emergency access. Each development project and each development project phase, except for a development project located exclusively on a cul-de-sac, shall have a minimum of two points of vehicular ingress and egress, designed to County road standards, with a minimum width of 26 feet of all-weather surface as defined in the Uniform Fire Code, from existing and surrounding streets. The Department may authorize one point of vehicular access to be an emergency access route with an all-weather surface if the Department first makes each of the following findings:

(A) Two points of nonemergency access are physically infeasible;

(B) Provisions have been made to reasonably ensure that the emergency access will be maintained; and

(C) Based on the review and consideration of the Fire Authority's recommendation, the emergency access route will provide adequate vehicular ingress and egress during emergencies.

(2) Private driveways or access roadways. Private driveways or access roadways for residential units shall not exceed 150 feet in length, unless approved by the Fire Authority in compliance with Section 10.207 of the Uniform Fire Code.

(3) Fences.

(A) Where wood or vinyl fencing is used, there shall be a minimum five-foot separation between the wood or vinyl fencing and the wall of the nearest structure except on those properties where previous construction occurred in compliance with a previous code. Fencing within the five-foot separation area shall be of noncombustible material or modified one-hour fire-resistance-rated construction.

(B) Fences or walls required adjacent to fuel modification areas or wildland areas as conditions of approval for a development project shall be constructed of noncombustible materials as defined in the California Building Code. All other fences, including those on the interior of a development project, are not subject to this requirement, except as required in subparagraph a, above.

(4) Water supply. Each development project shall provide six-inch or larger circulating (loop) water mains as required by the Uniform Fire Code, proper hydrant location and spacing, and have sufficient water storage capacity to provide the minimum fire flow duration requirements [gallons per minute (GPM) for a minimum number of hours or portions thereof] as specified by the minimum system standards established by the Fire Authority. Circulating (loop) mains are not required for cul-de-sacs and are not required for subdivisions that exclusively take all access from cul-de-sacs. In areas not served by water purveyors, on-site fire flow and water storage requirements shall be as specified by the Uniform Fire Code.

(5) Access to water supplies. There shall be vehicular access, at least 12 feet in width, to within at least 10 feet of each static water source, including ponds, lakes, swimming pools, reservoirs and water storage tanks. Access shall be either to a plumbed outlet with two-and-one-half-inch National Hose Thread Fitting, or directly to the source. This requirement shall be waived if the Fire Authority determines that the water source is sufficiently below the elevation of existing or proposed roads or driveways to make drafting of water from the source through a plumbed outlet

infeasible, and that direct vehicular access to the water source would require an impractical extension of a road or driveway.

(6) Fuel modification areas.

(A) A permanent fuel modification area shall be required around a development project or portions thereof that are adjacent or exposed to hazardous fire areas for the purpose of fire protection. In no case shall this area be less than 100 feet in width as measured from the development perimeter. Where feasible, the area shall be designated as common open space rather than private open space. The recommended width of the fuel modification area shall be determined based on a fuel modification plan filed in compliance with Subsection 82.13.040.(f)3 (Application Requirements Fuel modification plans), above.

(B) When a development project is phased, individual phases may be required to provide temporary fuel modification areas, where the development perimeter of a phase is contiguous to a subsequent phase of a project, which in its undeveloped state is a hazardous fire area. The need for a temporary fuel modification area shall be determined by the responsible Fire Authority in conjunction with the County Fire Marshall and shall be based upon the same considerations described in Subparagraph a, above, for permanent fuel modification areas and the factors addressed in the required fuel modification plan.

(7) Setback requirements. Each proposed structure shall comply with the following setback requirements as applicable, in addition to the setbacks required by the applicable primary land use zoning district, and the building separation requirements in Subsection C. (Building separation), below.

(A) Firewood or flammable materials storage. Each area used for the storage of firewood, or other flammable materials, shall either be located at least 30 feet away from all structures, or wholly enclosed within a structure.

(B) Fuel tanks. Fuel tanks (e.g., liquefied petroleum tanks) shall be located at least 10 feet away from any structure and shall be in compliance with the standards in the Uniform Fire Code, Section 83.02.080 (Allowed Projections into Setbacks), and Section 83.01.060 (Fire Hazards). The tanks shall be secured to the ground.

(C) National Forest boundary. Each structure on a lot that was created after April 12, 2007 and abuts a boundary of the San Bernardino National Forest shall be set back at least 100 feet from the boundary.

(D) Sloping site setbacks or fuel modification. Each structure proposed in an area with slopes exceeding 30 percent and 30 feet in height shall comply with the following requirements:

(I) Where a structure is proposed or within 200 feet of a slope that is greater than 30 percent before grading and where the slope is at least 30 feet in height, the vegetation on the slopes shall be treated in a manner so that it becomes a fuel modified area. The fuel-modified area shall be maintained for either the entire slope, or 100 feet, or to the property line, whichever distance is less for existing parcels or the distance prescribed by a fuel modification plan for new development.

(II) Where grading is utilized that does not conform to the natural slope and the graded area is adjacent to natural ungraded slopes that are greater than 30 percent in gradient and greater than 30 feet in height, each structure shall be set back at least 30 feet from the edges of the graded area adjacent to the natural ungraded slopes.

(8) Street name signs. All public or private streets within or bordering a development project shall have noncombustible and reflective street name signs designed to County standards and visible at all street intersections.

(9) Fire hydrant identification. Each fire hydrant shall be identified by a method specified by the Fire Authority.

(10) Erosion and sediment control. Each development project, building permit, grading and any other significant land disturbing activity shall include the installation of erosion control measures in compliance with this Development Code.

(c) Building separation standards. The intent of the following exterior wall separation standards is to reduce the exposure and risk from adjacent structural fires and to reduce the potential spread of fire from structure to structure.

(1) Building separation standards in FS1 and FS2 areas. In FS1 and FS2 areas, the following shall apply:

(A) Each building on a parcel shall have exterior wall separations of at least 30 feet.

(B) Residential structures shall have interior side yard setbacks of 20 percent of the lot width, provided that these interior side yards shall not be less than five feet and need not exceed 15 feet. In no case shall exterior wall separations be less than 10 feet for all buildings, including those on adjoining parcels. Eaves shall be permitted to project into the required setback no more than two feet. No other projections shall be allowed in the required setbacks unless a variance is obtained.

(C) When the exterior walls of residential and accessory buildings or portions thereof are within 15 feet of interior side or rear lot lines, or the exterior wall separation is less than 30 feet, the outside of each exterior wall or portion

thereof shall be constructed with the modified one-hour construction. Modified one-hour construction shall be defined by the Building Official. Where building separations are less than 10 feet, additional mitigation measures may be required by the responsible Fire Authority;

(D) In compliance with Section 82.13.090 (Alternate Hazard Protection Measures), and dependent upon site specific conditions, the following measures or combinations of measures may be substituted for the exterior wall separation requirements for all structures in FS1 and FS2 areas:

(I) The expansion of fuel modified areas around the perimeter of the development project beyond that required by this Section or other requirement of the County Code.

(II) A substantial transfer of density from steeper slopes, including areas with slopes less than 30 percent if they exist on-site, to less steep areas within the development project.

(III) Clustering of structures away from the development perimeter and away from fire hazard areas.

(IV) Other alternate measures (e.g., sprinklers, etc.) if approved by the Department in compliance with Section 82.13.090 (Alternate Hazard Protection Measures).

(2) Building separation standards in FS3 areas. In FS3 areas, exterior walls shall be constructed of noncombustible materials or shall provide the equivalent one-hour fire-resistance-rated construction on the exterior side. Interior side yards shall not be less than five feet in width. Within the Mountain Region, building separation and side yard setbacks shall be as described in Paragraph 1, above.

(d) Building construction requirements.

(1) Eaves.

(A) In FS 1 and FS2 areas, eaves shall be boxed in perpendicular to the adjoining wall and shall be one-hour protected.

(B) In FS3 areas, eaves shall be enclosed with a minimum seven-eighth inch stucco or equivalent protection.

(2) Exterior doors. All exterior doors made of wood or wood portions shall be solid core wood. For exterior doors with inset windows, refer to Subparagraph 3.(A), below.

(3) Exterior glazing. Exterior glazing shall comply with the provisions of the California Building Code and with the following additional requirements:

(A) Exterior windows, window walls and glazed doors, and windows within exterior doors, shall be multi-layered glass panels (dual- or triple-paned), tempered glass, or other assemblies approved by the Building Official.

(B) Vinyl window frame assemblies shall be prohibited, except when they have all of the following characteristics:

(l) Frame and sash are comprised of vinyl material with welded corners;

(ll) Metal reinforcement in the interlock area;

(lll) Glazed with insulated glass or tempered;

(lV) Frame and sash profiles are certified in American Architectural Manufacturing Association (AAMA) Lineal Certification Program (verified with either an AAMA product label or Certified Products Directory); and

(V) Certified and labeled in compliance with American National Standards Institute (ANSI)/AAMA/National Wood Window and Door Association (NWWDA) structural requirements.

(4) Insulation. Paper-faced insulation shall be allowed in attics or ventilated spaces only if the paper is not exposed to the attic open space. Cellulose insulation is required to be fire retardant.

(5) Roof coverings. Roof coverings shall be either noncombustible or shall be fire retardant material not composed of organic fiber with a minimum Class A rating, as defined in the California Building Code. The tile shall be tight-fitting and the open ends of high-profile tile shall be capped with non-ignitable material to prevent birds' nests or other combustible material from accumulating. Gutters and downspouts shall be constructed of noncombustible material.

(6) Spark arresters. Each chimney used in conjunction with a fireplace, or other heating appliance in which solid or liquid fuel is used, shall be maintained with a spark arrester. An approved spark arrester shall mean a device constructed of stainless steel, copper or brass, woven galvanized wire mesh, 12 gauge minimum of three-eighths inch minimum to one-half inch maximum openings, mounted in or over all outside flue openings in a vertical and near vertical position, adequately supported to prevent movement and visible from the ground.

(7) Street address numbers. Each non-accessory building shall have internally illuminated non-combustible building address numbers legible from the street in compliance with the Uniform Fire Code.

(8) Vents and openings. Louvers, ventilators, or openings in walls, roofs, attics, and underfloor areas having headroom less than four feet in height that are not fitted with sash or doors, shall be covered with wire screen. The screen covering the openings shall be corrosion-resistant metal or other approved material that offers equivalent protection and shall have a maximum mesh of one-eighth inch. Eave-type attic ventilators and roof-mounted turbine vents are prohibited.

(9) Water faucets. A minimum of two, three-quarter-inch faucets with hose connections each served by a three-quarter-inch waterline and installed before any pressure-reducing device shall be available per habitable structure separated by at least one-third of the perimeter of the structure. The faucets shall be on the sides of a structure facing fire hazardous areas whenever possible.

(e) Perimeter access to fuel modified and fire hazard areas. Fire fighting vehicles shall have adequate access into areas between fire hazardous areas or fuel modified areas and the development perimeter, so that a wildland fire can be contained at the development perimeter and prevented from spreading to structures. Each development project shall provide adequate vehicular access for fire fighting vehicles to the development perimeter of the project along the portion of the development perimeter that is adjacent to either an existing or proposed fuel modified area, or a fire hazard area. Provisions shall be made and shall be required, where necessary, through conditions of approval for the development project for the continual maintenance of the areas intended to provide the access. Perimeter access shall be provided, through either of the following measures or through alternate measures in compliance with Section 82.13.090 (Alternate Hazard Protection Measures).

(1) The provision of an existing or proposed road along the development perimeter, or portion thereof that is exposed to a fire hazard or fuel modified area, and which is accessible to fire fighting equipment. The road shall be capable of supporting fire-fighting equipment, shall be at least 20 feet in width, and shall not exceed a grade of 14 percent. The conditions of approval for the development project shall require provisions to ensure that the roadway will be maintained, if it is not within the publicly maintained road system.

(2) Development projects shall provide access ways, at least 12 feet in width, with a grade not to exceed 14 percent, and capable of supporting fire fighting vehicles, between the development perimeter and proposed or existing streets. Access ways shall be spaced at intervals of no more than an average of 350 feet along each street. The conditions of approval for the development project shall require specific provisions to ensure that access ways will remain unobstructed and will be maintained. Where feasible, access ways may not be paved and shall be designed so as not to detract from the visual quality of the project.

(f) Length of cul-de-sacs. Cul-de-sacs shall not exceed 350 feet in length, except that they may be extended as allowed by this Subsection.

(1) Exception for parcels of less than five acres. A cul-de-sac may exceed 350 feet in length but shall not exceed 600 feet in length, if parcels that take access from the cul-de-sac are less than five acres, and:

(A) Alternate measures are utilized in compliance with Section 82.13.090 (Alternate Hazard Protection Measures); or

(B) Based upon consideration of the recommendation of the Fire Authority, the Department determines that the cul-de-sac is situated and designed so that each parcel taking access from it is not contiguous to or exposed to either undeveloped fuel modified areas along the development perimeter of the project or to fire hazard areas, and that the extension of the cul-de-sac will not increase the exposure of buildings to wildland fires.

(2) Exception for parcels larger than five acres. A cul-de-sac may exceed 600 feet in length if all parcels that take access from the cul-de-sac are five acres or greater in area and:

(A) The proposed cul-de-sac is not within or adjacent to areas that are zoned for or subdivided to parcels of five acres or less.

(B) Alternate measures are utilized in compliance with Section 82.13.090 (Alternate Hazard Protection Measures).

(3) Alternate measures. In compliance with Section 82.13.090 (Alternate Hazard Protection Measures) and dependent upon site specific conditions, one of the following measures or combination of measures may be used to mitigate the effect of creating cul-de-sacs up to 600 feet in length with parcels less than five acres in area:

(A) Limitation of the total number of dwelling units with access to the cul-de-sac to no more than 15, and restriction of further subdivision of parcels and construction of additional independent residential units which have access to the cul-de-sac. These restrictions shall be imposed through conditions of approval of the development project.

(B) A continuous perimeter access road at least 20 feet in width is provided along the portion of the cul-de-sac exposed to fire hazard or fuel modified areas such that it is drivable under normal conditions by fire fighting vehicles, provides adequate maneuvering space for the vehicles, and is designed so that at least one point of access to the perimeter access road is taken from roads other than the subject cul-de-sac.

(C) The cul-de-sac road will have a paved width of at least 40 feet with posted no parking for its entire length, and there is at least one area approximately at the midpoint of the cul-de-sac that serves the same function of a cul-de-sac bulb in allowing fire fighting vehicles adequate room to turn around. This measure may only be utilized if the expansion of the road width will not contribute to slope stability hazards either on-site or off-site.

(D) Other alternate measures approved by the Department in compliance with Section 82.13.090 (Alternate Hazard Protection Measures).

(g) Additional requirements. Dependent upon specific site conditions (e.g., building separation, fire flow, road conditions, slope, vegetation, etc.) or a combination of conditions, the responsible Fire Authority may require structures to meet more stringent construction standards (e.g., full perimeter exterior walls to be constructed to the modified or full one-hour construction standards, sprinklers, soffitted eaves, etc.) as additional mitigation to the fire threat.

Adopted 4011 (2007)

82.13.070 FS1 Additional Development Standards

The requirements of this Section apply only to the FS1 Overlay and are in addition to the requirements in Section 82.13.060 (FS1, FS2, and FS3 Development Standards).

(a) Concealed spaces. Unenclosed or projecting assemblies (e.g., cantilevered floors, bay windows, etc.) that contain concealed space shall be protected on the exposed surface with materials approved for the modified one-hour construction.

(b) Decks. Cantilevered or standard type decks shall be:

(1) Constructed with a minimum of at least one-and-one-half-inch wood decking; and/or

(2) Protected on the underside with materials approved for one hour fire resistive construction; and/or

(3) Composed of noncombustible materials, as defined in the California Building Code.

(c) Exposed piping. Exposed piping, except for plumbing vents above the roof, shall be noncombustible as defined in the California Building Code.

(d) Patio covers. Patio covers attached or within 10 feet of a residential structure with plastic, bamboo, straw or fiberglass or wood lathe lattice made of materials that are one-half-inch or less in width shall be prohibited.

Adopted 4011 (2007)

82.13.080 Soil Erosion and Sediment Control Plans/Permits

This Section provides regulations and procedures for project planning, preparation of Soil Erosion and Sediment Control Plans, runoff control, land clearing, and winter operations in order to control existing and potential conditions of human induced accelerated erosion.

(a) Applicability. The regulations in this Section apply to all areas within Fire Safety (FS) Overlays, except for ministerial projects within the FS2 and FS3 Areas that are located on parcels that are less than one acre and have a slope of less than 10 percent.

(b) Soil Erosion and Sediment Control Plans/Permits.

(1) Compliance of land clearing or grading activities with approved Plan. Land clearing or grading activities in Fire Safety (FS) Overlays shall comply with the provisions of an approved Soil Erosion and Sediment Control Plan, unless exempt as follows:

(A) Exempt in compliance with Section 88.02.030 (Exempt Activities); or

(B) Exempt as determined by the Building Official.

(2) Approval of Plan before issuance of permits. A Soil Erosion and Sediment Control Plan shall be submitted and approved before the issuance of the following:

(A) Building Permits.

(B) Grading Permits.

(C) Soil Erosion and Sediment Control Permits.

(D) Other permits where, in the opinion of the Building Official, erosion can reasonably be expected to occur.

(3) Plan contents. A Soil Erosion and Sediment Control Plan shall:

(A) Include the applicable measures required by this Chapter and other measures or modifications of proposed measures required by the Building Official.

(B) Identify building and access construction envelopes and identify areas that will not be disturbed by construction activity in order to minimize disturbance of erodible areas of a proposed development site.

(C) Preserve existing streams and drainage courses in their natural condition in order to retain their ability to accommodate runoff and water drainage with a minimum of erosion.

(4) Permit application requirements. The Building Official shall specify the following application requirements for Soil Erosion and Sediment Control Permits:

(A) Requirements for the submittal of plans and supporting data to accompany applications for Soil Erosion and Sediment Control Plans and Soil Erosion and Sediment Control Permits.

(B) Licensing and/or certification requirements for those preparing Soil Erosion and Sediment Control Plan and Permit submittals.

(C) The incorporation and coordination of Soil Erosion Control Plans and Permits with other plan requirements.

(D) Other data/materials identified by the Building Official.

(5) Additional permit requirements. For additional permit requirements, see Subsection 88.02.050(f)(2) (Winter operation measures Additional permit requirements).

(c) General erosion control requirements.

(1) Conditions causing accelerated erosion prohibited. No person shall cause, or allow the continued existence of, a condition on a site that is causing or is likely to cause accelerated erosion as determined by the Building Official.

(2) Notification to control erosion. Upon notification by the Building Official, the responsible person shall take appropriate measures to control erosion on the site within a reasonable period of time as determined by the Building Official.

(3) Plan/Permit approval. The Building Official may require that a property owner, whose property has been cited in compliance with Subsection (2) (Notification to control erosion), above, file and obtain approval of a Soil Erosion and Sediment Control Plan and Soil Erosion and Sediment Control Permit in compliance with Subsection (b) (Soil Erosion and Sediment Control Plans/Permits), above.

(4) Cessation of activities due to inclement weather. The Building Official may direct that a particular operation, process, or construction be stopped during periods of inclement weather if the Building Official determines that erosion problems are not adequately being controlled.

(5) Applicable laws and regulations. Land clearing and grading activities that comply with this Section shall also comply with all other applicable local, state, and Federal laws and regulations. Where there is a conflict with other preexisting County regulations, the conflict shall be resolved by using the least restrictive standard and shall be accomplished before the project is allowed to proceed.

(6) Appeals. A property owner, an aggrieved person, or a person whose interests are adversely affected by an action or determination of the Building Official may appeal the action or determination in compliance with Chapter 86.08 (Appeals).

(7) Variances. The Director may approve, conditionally approve, or deny a variance from the provisions of this Section, the permit conditions, or the plan specifications in compliance with Chapter 85.17 (Minor Variances). The Director may refer a variance request to the Commission in compliance with Section 85.17 (Variances).

(d) Runoff control measures. Activities subject to a development permit (e.g. Conditional Use Permit, Grading Permit, Planned Development Permit, Site Plan Permit, Temporary Use Permit, etc.) shall implement measures to control runoff in order to prevent erosion. Measures shall be adequate to control runoff from a 10-year storm.

(1) Prevention of sediment discharge. Erosion control and surface flow containment facilities shall be constructed and maintained to prevent discharge of sediment to surface waters or storm drainage systems.

(2) Permeability rate.

(A) More than two inches per hour. Where soils have a permeability rate of more than two inches per hour, runoff in excess of predevelopment levels shall be retained on the site by methods and in quantities approved by the Building Official. This may be accomplished through the use of infiltration basins, percolation pits or trenches, or other suitable means. This requirement may be waived where the Building Official determines that high groundwater, slope stability problems, etc., would inhibit or be aggravated by onsite retention, or where retention will provide no benefits for groundwater recharge or erosion control.

(B) Two inches per hour or less. Where soils have a permeability rate of two inches per hour or less and onsite percolation is not feasible, runoff shall be detained or dispersed over nonerodible vegetated surfaces so that the runoff rate does not exceed the predevelopment level. When the runoff rate must exceed the predevelopment level, the runoff water shall be discharged over nonerodible surfaces or at a velocity that will not erode. The Building Official shall require onsite detention unless the applicant shows that the runoff will not contribute to downstream erosion, flooding, or sedimentation.

(3) Onsite percolation devices. Concentrated runoff that cannot be effectively dispersed over nonerodible channels or conduits to the nearest drainage course shall be contained within onsite percolation devices.

(4) Energy dissipaters at point of discharge. Where water will be discharged to natural ground or channels, appropriate energy dissipaters shall be installed to prevent erosion at the point of discharge.

(5) Detention or filtration mechanisms. Runoff from disturbed areas shall be detained or filtered by berms, vegetated filter strips, catch basins, or other means necessary to prevent the escape of sediment from the disturbed area.

(6) Deposition of earth or materials prohibited. No earth, organic, or construction material shall be deposited in or placed where it may be directly carried into a stream, lake, marsh, slough, lagoon, or body of water.

(7) Buffer zone along land/water margin. Where land disturbing activities are in proximity to lakes or natural watercourses, a buffer zone shall be required along the land/water margin of sufficient width to confine visible siltation within 25 percent of the buffer zone nearest the land disturbing activities.

(e) Land clearing measures. Activities subject to a development permit (e.g. Conditional Use Permit, Grading Permit, Planned Development Permit, Site Plan Permit, Temporary Use Permit, etc.) shall provide the following land clearing measures:

(1) Approval of Plan/Permit required before commencement of activities. No land clearing activities, except as otherwise allowed by this Section, shall take place before approval of the Soil Erosion and Sediment Control Plan and/or Permit.

(2) Limitations on land clearing and vegetation removal. Land clearing shall be kept to a minimum. Vegetation removal shall be limited to that amount necessary for building, access, fire protection and construction as shown on the approved Soil Erosion and Sediment Control Plan or as allowed by the Building Official through a Soil Erosion and Sediment Control Permit.

(3) Establishment of vegetation. Disturbed surfaces shall be prepared and maintained to control erosion and to establish vegetative growth compatible with the area. This control shall consist of any one or a combination of the following:

1. Effective temporary planting (e.g., rye grass, fast germinating native seed, etc.) and/or mulching with straw, pine needles, chippings, or other slope stabilization material.

2. Permanent planting of compatible drought resistant species of ground cover, shrubs, trees, or other vegetation.

3. Mulching, fertilizing, watering, or other methods necessary to establish new vegetation.

(4) Installation and maintenance of protection. The protection required by this Section shall be installed before calling for final approval of the project and at all times between October 15 and April 15. The protection shall be maintained for at least one year or until permanent protection is established.

(5) Vegetation removal between October 15 and April 15. Vegetation removal between October 15 and April 15 shall not precede subsequent grading or construction activities by more than 15 days. During this period, erosion and sediment control measures shall be in place.

(f) Winter operation measures.

(1) Winter operation erosion control measures. Land clearing and grading activities during the winter months (i.e., activities between October 15 and April 15) that are subject to a development permit (e.g. Conditional Use Permit, Grading Permit, Planned Development Permit, Site Plan Permit, Temporary Use Permit, etc.) shall implement the following winter operation measures to prevent accelerated erosion. The Building Official may require additional measures when determined to be necessary by field inspection.

(A) The Building Official shall authorize the following activities between October 15 and April 15 only if the Building Official determines that the activities comply with the provisions of, and are consistent with the purposes of, this Section:

(I) Contiguous land clearing operations involving greater than one acre in a one-year period of time.

(II) Major grading operations (greater than 100 cubic yards).

(B) Between October 15 and April 15, disturbed surfaces not involved in the immediate operation shall be protected by mulching or other effective means of soil protection.

(C) Roads and driveways shall have drainage facilities sufficient to prevent erosion on or adjacent to the roadway or on downhill properties. Erosion-resistant surfacing may include, but is not limited to, slag, crushed rock or natural soil when compacted to 90 percent of maximum density.

(D) Runoff from a site shall be detained or filtered by berms, vegetated filter strips, or catch basins to prevent the escape of sediment from the site. These drainage controls shall be maintained by the permittee or property owner as necessary to achieve their purpose throughout the life of the project.

(E) Erosion control measures shall be in place at the end of each day's work.

(2) Additional permit requirements. In addition to the requirements in Section 82.13.080, the following shall also apply:

(A) When construction will be delayed due to the limitation on winter operations, the date for expiration of the permit shall be extended by that amount of time that work is delayed by the requirements of this Section.

(B) The Building Official shall stamp or attach the following statement to all development permits and plans issued for projects subject to the provisions of this Section.

NOTICE: IF THE CONSTRUCTION ACTIVITY WILL EXTEND INTO THE WINTER OPERATIONS PERIOD (OCTOBER 15 THROUGH APRIL 15), ADDITIONAL SOIL EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED.

ANY DEVELOPMENT PROJECT WHICH IS REQUIRED TO IMPLEMENT AN APPROVED SOIL EROSION AND SEDIMENT CONTROL PLAN SHALL HAVE THE APPROVED PLAN AMENDED IF IT DOES NOT COMPLY WITH SUBSECTION 82.13.080 (f) (Winter Operation Measures) OF THE SAN BERNARDINO COUNTY DEVELOPMENT CODE. ALL REQUIRED WINTER OPERATION EROSION CONTROL DEVICES SHALL BE INSTALLED BEFORE OCTOBER 15 FOR ONGOING CONSTRUCTION PROJECTS AND BEFORE ANY CONSTRUCTION ACTIVITY FOR THOSE DEVELOPMENT PROJECTS COMMENCING BETWEEN OCTOBER 15 AND APRIL 15.

(g) Inspections.

(1) Types of inspections. The Building Official may perform the following inspections to ensure compliance with this Section:

(A) Pre-construction inspection. A pre-construction inspection to determine the potential for erosion resulting from the proposed project.

(B). Progress inspections. Periodic progress inspections to determine ongoing compliance with the Soil Erosion and Sediment Control Plan.

(C) Final inspection. A final inspection to determine compliance with the Soil Erosion and Sediment Control Plan and with other approved plans and specifications.

(2) Notification. The permittee shall provide the Building Official at least:

(A) Commencement of work. Twenty-four hours' advance notice before the commencement of authorized work.

(B) Inspection request. Nine business hours' advance notice of an inspection request.

(3) Right of entry. Filing an application for a development permit (e.g. Conditional Use Permit, Grading Permit, Planned Development Permit, Site Plan Permit, Temporary Use Permit, etc.) constitutes a grant of permission for the County to enter the permit area for the purpose of administering this Section from the date of the application filing to the termination of the erosion control maintenance period.

(h) Continued responsibility. The property owner and the permittee shall be responsible for ensuring that accelerated erosion does not occur from an activity during and after project construction. Additional measures, beyond those specified in an approved Soil Erosion and Sediment Control Plan, may be required by the Building Official as deemed necessary to control erosion after project completion.

(i) Post-approval procedures. The procedures and requirements in Division 6 (Development Code Administration), related to permit implementation, time limits, extensions, appeals, and revocations, shall apply following the decisions on Soil Erosion and Sediment Control Plans and Soil Erosion and Sediment Control Permits.

Adopted 4011 (2007)

82.13.090 Alternate Hazard Protection Measures

(a) Purpose. This Section allows greater design flexibility than would otherwise be permitted to more efficiently and effectively achieve the purposes of the FS Overlay. Design flexibility is provided by allowing the substitution of alternate measures for otherwise applicable requirements if it is found that they provide the same or a greater level of protection from wildland fires and other natural hazards, and that they will fulfill the same purpose as the established standard or requirement.

(b) Applicability.

(1) The provisions of this Section following shall apply only to the standards and requirements of:

(A) Subsection 82.13.060(c)2. (Building separation standards in FS1 and FS1 areas);

(B) Subsection 82.13.060(e) (Perimeter access to fuel modified and fire hazard areas); and

(C) Subsection 82.13.060(f) (Length of cul-de-sacs).

(2) Since these alternative measures apply to the standards and requirements that pertain to these three specific design elements, they are intended to be applied to development projects only and not to individual parcel conditions. Therefore, they do not apply to the determination of setbacks for residential construction on individual lots.

(c) Substitution of alternative measures for standards and requirements.

(1) If alternative measures are proposed, the Fire Authority shall determine, with specific consideration of the effect of the proposed alternative measures, whether the proposed development project has adequate provisions for fuel modification and management, including the ongoing maintenance of fuel modified areas.

(2) If the Fire Authority makes a positive determination in compliance with Paragraph 1, above, alternate measures may be substituted for the established standards and requirements if the Department, with consideration of the recommendation of the Fire Authority, finds and justifies all of the following:

(A) The approved alternative measures meet the intent of, and serve the same purpose as, the established standard or requirement.

(B) The approved alternative measures provide the same or a greater level of protection or are as effective as the established standard or requirement.

(C) There are clear and substantial reasons for utilizing the alternative measures because they provide for a more efficient and economic use of the site, or provide for a superior physical design, and are consistent with the intent of the FS Overlay.

Adopted 4011 (2007)

Appendix G:
Water and Sewer Feasibility Studies

G.1 - Sewer Feasibility Study for Mooncamp Project (San Bernardino County, April 2007)

SPECIAL DISTRICTS DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

WATER AND SANITATION DIVISION
12402 Industrial Blvd., Building D, Suite 6
Victorville, CA 92395
PO Box 5004 • Victorville, CA 92393
(760) 955-9885 • (800) 554-0565
Fax (760) 955-9685

CRESTLINE SANITATION DISTRICT
24516 Lake Drive
Crestline, CA 92325
PO Box 3395 • Crestline, CA 92325
(909) 338-1751
Fax (909) 338-5306

THOMAS L. SUTTON
Director

MANUEL M. BENITEZ
Deputy Chief

April 17, 2007

Michael Perry
P. O. Box 706
Big Bear City, CA 92314

Subject: Updated Sewer Feasibility Study
APN: 0304-091-12, 13, 21 & 0304-082-04 TTM 16136
RCK Properties, Inc./Moon Camp
County Service Area 53, Improvement Zone B

Dear Mr. Perry:

The District Engineer has completed the Updated Sewer Feasibility Study. The purpose of the study was to determine the equivalent dwelling unit (EDU) assignment, costs/fees and evaluate sewer service alternatives. The study indicates County Service Area 53, Improvement Zone B can serve the above referenced project.

The study is valid for one-year from the date of issue.

If you decide to move forward with the project or have questions, please contact this office.

Sincerely,

Diana S. Parra

For: James A. Oravets
Division Chief, Engineering

JAO:ce

cc: Kathy Whalen, District Manager

Enclosure: Updated Sewer Feasibility Study

MARK H. UFFER
County Administrative Officer

NORMAN A. KANOLD
Assistant County Administrator
Public and Support
Services Group

Board of Supervisors
BRAD MITZELFELT ..... First District
PAUL BIANE ..... Second District
JOSIE GONZALES ..... Fifth District
DENNIS HANSBERGER ..... Third District
GARY C. OVITT ..... Fourth District

So & Associates Engineers Inc.

16209 KAMANA RD., SUITE 200 • P.O. BOX 1712 • APPLE VALLEY, CA 92307 • PHONE (760) 242-2365 FAX (760) 242-3083

April 11, 2007

101.0110-359

County of San Bernardino
Special District Department
Water & Sanitation Division
12402 Industrial Blvd., Bldg. D, Suite 6
Victorville, CA 92392

Attention: Mr. Gary Martin
Interim Division Engineer

Reference: County Service Area 53, Improvement Zone B (CSA 53-B) Updated Sewer Feasibility Study for APN's 0304-091-12,13, 21 and 0304-082-04, TTM 16136 (RCK Properties, Inc./Moon Camp)

Dear Mr. Martin:

In accordance with CSA 53-B (District) authorization, we have completed the subject feasibility study for APN's 0304-091-12, 13 & 21 and 0304-082-04, TTM 16136 for connection to CSA 53-B sewer system. We are pleased to submit the FINAL feasibility study report for District's review and consideration.

A. Wastewater Flow From the Proposed Development

The proposed development is a housing development located within the portion of Northeast 1/4 of Section 13, Township 2 North and Range 1 West. The proposed project will consist of 50 single family housing as shown in Figure 1. The sewer capacity requirement of the proposed project will be calculated based on one equivalent dwelling unit (EDU's). For this study, average wastewater flow per EDU in the CSA 53 (Fawnskin) is typically estimated at 215 gpd (gallon per day). In this case, proposed project will be assigned a maximum occupancy of 50 EDU's with an average flow at 215 gpd/EDU x 50 = 10,750 gpd. For preliminary design purpose, a peaking factor of four will be used. The estimated peak wastewater flow for the proposed development will be 43,000 gpd (29.86 gallons per minute).

B. Existing Sewer System Capacity and Review and Buy-In Cost

The existing sewer system located to the southeast and southeast side of the project site should be capable of handling the wastewater flow from the proposed development based on estimated flows

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as discussed above. The internal collection sewer system design has been presented in Figure 1 based on the grading plans. The project developer (through its civil engineer) will be required to submit the proposed internal collection system to CSA 53B for review and approval.

County Service Area 53-B Local Sewer Cost: On September 15, 2005 the County Board of Supervisors adopted an Ordinance authorizing the Special Districts Department to implement increases in fees and charges. The study included recommendations on capital funds required to construct infrastructure to ensure adequate capacity in the District's respective water and sewer systems. The local connection fee approved for County Service Area 53-B (Fawnskin) is $ 1,358.72.

Local Connection Fee = $1,358.72/EDU x 50 EDU
= $ 67,936.00

C. Estimate Cost of System Improvements

On-Site Facilities: The proposed development will be entirely responsible for all costs of internal plumbing and sewer facilities including manholes and re-connection to the CSA 53-B system at location(s) approved by CSA 53B. All on-site gravity facilities must be minimum 8-inch diameter. The proposed project will be required to construct the onsite collector sewer as shown in Figure 1. All on-site facilities must meet CSA 53-B standards and specifications, and construction plans must be submitted for plan check and approval by District Engineer.

Off-Site Facilities: Based on the grading plan and sewer layout plan of the proposed development, the developer of TTM 16136 will be responsible for an offsite sewer extension of about 1,200 LF along North Shore Drive to connect to the existing 8-inch collector sewer to the southwest of the property. This improvement will be able to serve some of the lots of the project as shown in Figure 1. The proposed development will be able to convey part of the wastewater flow via gravity sewer to the existing Pump Station "B"(to the southeast of the property, refer Figure 1); and some of the subdivided lots may require additional on-site sewage lift stations(s). CSA 53-B staff and engineer will continue to monitor and upgrade the collection sewer system to ensure adequate capacity and reliable service to its customers.

D. Regional Connection Fee

Regional connection fees imposed by BBARWA (Big Bear Area Regional Wastewater Authority) for sewage treatment and disposal are presently assessed at $2,704.99 per equivalent dwelling unit

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(EDU) and an additional $ 100 fee for the Fawnskin area (CSA 53-B). The above connection fees are subject to adjustment each year. The exact connection fees for the proposed project will be reviewed at the time when application is made to connect to the District's sewer system, based on the most current project information. An estimate of the fee at this time would be as follows:

Regional Connection Fee	= $2,704.99/EDU x 50 EDU
	= $135,249.50

E. Plan Check/Inspection Fee

The sewer line design and connection details must be submitted through the Special Districts Department for plan check and approval. The District's current plan check fee is set per Board Resolution 97-95 and will be determined at a later date. Prior to start of construction, the property owner or the contractor must also deposit with the Special District's Department an inspection fee, again per District rules and regulations.

F. Monthly User Fee

The monthly user fee will be determined by the District's staff at the time the sewer connection application is made. Based on District's rules, regulations and the estimated number of EDUs. The current monthly user fee is $ 40.91/EDU.

G. Summary of Estimated Costs

Based on limited information provided by the developer's engineer, the following briefly summarizes the various sewering costs and connection fees:

• On-site collector sewer and lift stations(s)	=	Developer to pay for the costs
• Off-site sewer extensions	=	Developer to pay for the costs
• Local sewer connection fees	=	$ 67,936.00
• Regional connection fee	=	$135,249.50

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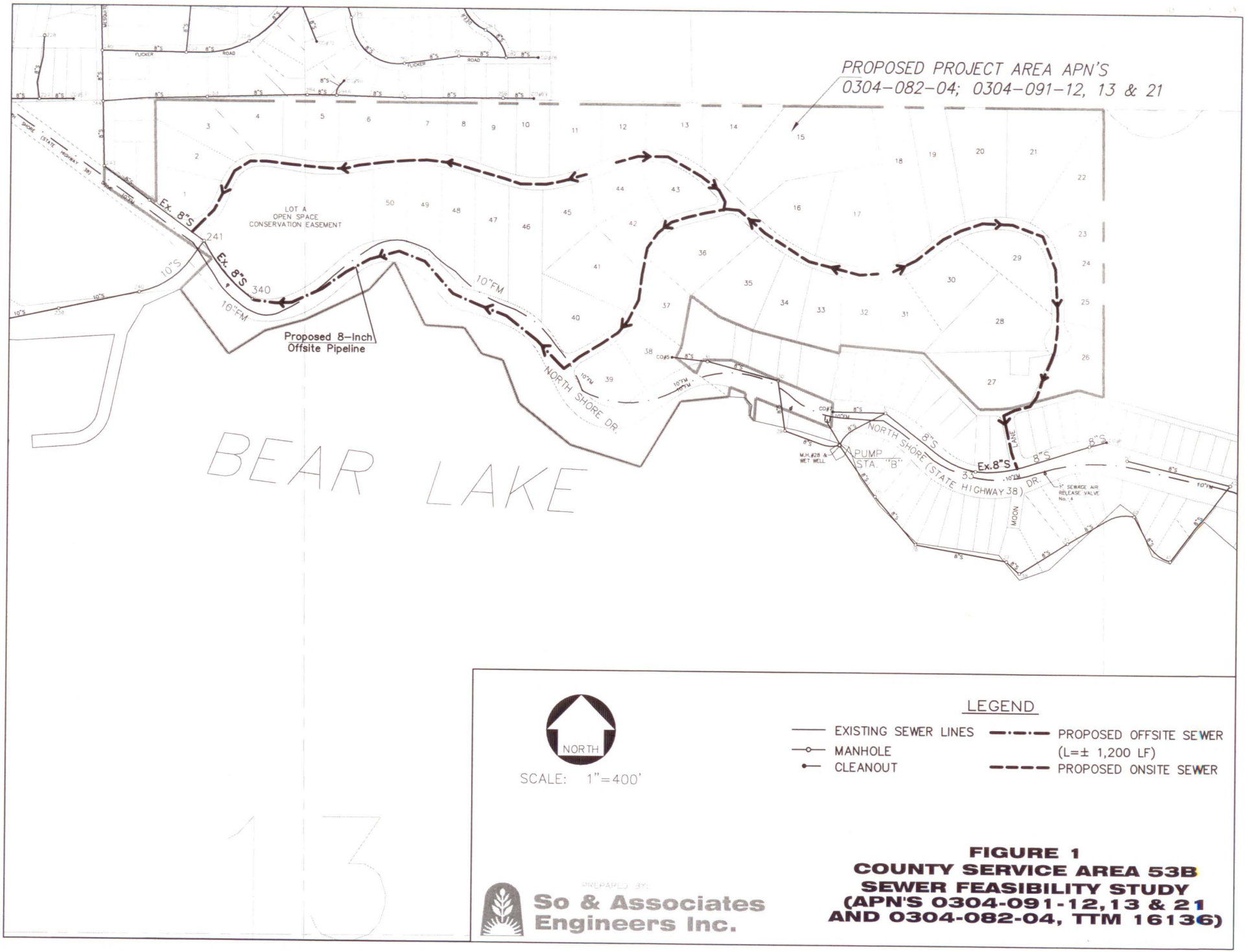
We trust that the information provided in this report will be helpful to the property owner and the Special District Department. Information provided in this letter report is valid for a period of one year from date of final report.

Very truly yours,

Wilson F. So, P.E.
District Engineer

Prepared By:

Kanchan Joshi



PREPARED BY:
So & Associates
Engineers Inc.

FIGURE 1
COUNTY SERVICE AREA 53B
SEWER FEASIBILITY STUDY
(APN'S 0304-091-12,13 & 21
AND 0304-082-04, TTM 16136)

G.2 - Final Water Feasibility Study (Alda Engineering, Inc. March 2007)

ALDA Engineering Inc.
9996 Orange Street
Alta Loma, CA 91737
Tel: 909-297-3741
Fax: 909-498-0423

March 6, 2007

Mr. Scott Heule, C.E.G./C.H.G., Assistant General Manager
City of Big Bear Lake
Department of Water & Power
41972 Garstin Drive
Big Bear Lake, CA 92315

Subject: **Final Feasibility Study to Serve the Proposed Moon Camp Residential Development** (Tentative Tract No. 16136)

Dear Mr. Heule:

Pursuant to your request, ALDA Engineering Inc. (ALDA) has conducted a feasibility study to determine the necessary system facilities to serve the above referenced development. This report summarizes the results of our investigation and recommendations. This report presents the project background, an assessment of demand and supply issues, the results of the system analysis, and the recommended improvements.

Project Background

The proposed Moon Camp development consists of 50 residential lots to be developed over approximately 62 acres of land. The proposed development is located along North Shore Drive, in the community of Fawnskin on the north side of Big Bear Lake, and ranges in elevation from approximately 6,750 ft. near the lake to approximately 6,950 ft. in the northeasterly quadrant. Individual lots range in size from approximately half an acre to well over two acres depending on location and are anticipated to be developed as single family residential units; average lot size is approximately one and a quarter acres. Because of its location and lot size, some of the residential units are anticipated to be fairly large and potentially exceed 4,000 square feet in size.

Water service to the proposed development will be provided off the Upper Fawnskin pressure zone as the Lower Fawnskin zone would not provide enough static head to provide the development adequate fire flow. DWP's closest pipeline off the Upper Fawnskin system is a single 6-inch diameter pipeline located near the intersection of Flicker Road and Chinook Road, approximately 2,000 ft away from the westerly boundary of the proposed development. Significant transmission improvements in the Fawnskin system are needed to provide fire flow to the proposed tract.

Currently, there are two groundwater production wells within the proposed residential tract. These wells are located in subarea A of the North Shore hydrologic subunit. It is our understanding that these wells will be deeded to the DWP at the time the tract map is recorded. The developer plans to equip the FP-2 well initially to meet the development projected water demands. The DWP will use excess capacity from this well to help reduce reliance on the leased North Shore Well No. 1. Groundwater production capacity from this well is estimated at approximately 100 gallons per minute. The second well (FP-3), located to the east of the FP-2 well, will not be initially equipped by DWP.

Pressure Zone Service Area

Based on the elevation range of the proposed development, 6,750 ft. to 6,950 ft., the development can be served off the Upper Fawnskin pressure zone. This pressure zone has an operating hydraulic grade of 7,113 ft. set by the high water level of the existing 0.25-million gallon Racoon Reservoir. Based on this hydraulic elevation, static pressures would range from a low of 71 psi at the highest point in Lot 18 to 157 psi near the lake. Individual pressure regulators would be required for all lots with static pressures exceeding 80 psi.

Water supply in the Fawnskin area is provided by two groundwater wells in the Lower Fawnskin pressure zone and by slant wells in the vicinity of the Racoon Reservoir. Excess groundwater production from the Lower Fawnskin pressure zone is conveyed to the Upper Fawnskin pressure zone through a booster station located at the Cline Miller Reservoir.

Water Demand

Projected water demand for the proposed development is based on the average consumption rate of 250 gallons per day per connection. Maximum day demand is estimated based on information provided in the recently completed water master plan and it is equivalent to 1.76 times the average day demand. Therefore, the average and maximum day demands for the proposed 50-lot subdivision are estimated as follows:

- Average Day Demand (ADD) = 12,500 gpd or 8.68 gpm
- Maximum Day Demand (MDD) = 15.27 gpm

Based on an estimated average day demand of 12,500 gallons, the annual water demand for the development is estimated at 4.56 million gallons or 14.00 ac-ft per year.

Water Supply

Water supply sources for this development must meet projected maximum day demands during the summer as well as annual demands. The existing on-site FP-2 well, when equipped by the developer, would be capable of meeting the projected maximum day demand for the proposed Tract 16136.

To meet the projected annual demand, the developer would have to participate in the Water Demand Offset Plan currently being implemented by DWP. This plan requires that any development that creates new lots must pay for the necessary facilities to reduce water demand somewhere else in the service area. The demand to be reduced is equivalent to one half of the average water demand for residential parcels in the service area, estimated at 250 gallons per day, for each new lot developed. Therefore, in the case of the proposed tract, a demand equivalent to 6,250 gallons per day (50 EDUs times 250 gallons per day per EDU times 50 percent) would need to be offset.

Fire Flow Requirements

Fire flow protection in the Fawnskin area is provided by the County of San Bernardino Fire Department. Information obtained from the Office of the Fire Marshall for the county indicates the following fire flow requirements for residential structures in the Fawnskin area:

- Structures less than 3,600 ft^2 - 1,000 gpm @ 20 psi with a two-hour duration
- Structures between 3,601 to 4,800 ft^2 - 1,750 gpm @ 20 psi with a two-hour duration
- Structures between 4,801 to 6,200 ft^2 - 2,000 gpm @ 20 psi with a two-hour duration

Additional information provided by the Office of the Fire Marshall indicates that fire flow requirements could be lowered if fire sprinklers are installed; however, actual requirements are determined individually based on the construction plans for individual residences.

For the purpose of this analysis and based on discussions held with DWP staff, a fire flow of 1,750 gpm @ 20 psi with a two-hour duration was used to size transmission, pumping, and storage facilities that would be needed to serve the proposed development.

Storage Requirements

Storage capacity for this development was sized to meet the operational, emergency and fire flow storage requirements. Operational storage is used to meet the hourly fluctuations in demand during maximum day conditions and has been established as 30 percent of maximum day. Emergency storage is used to meet demands during a power outage or other emergency situation when supply sources and boosting pumps may not be available; DWP requirements for emergency storage are equivalent to one day of maximum day demand.

Fire flow storage is equal to the fire flow capacity (1,750 gpm) times its duration (two-hours). Storage requirements for the proposed development are as follows:

■ Operational Storage = 30% of MDD (15.27 gpm):	6,600 gallons
■ Emergency Storage = 100% of MDD (15.27 gpm):	22,000 gallons
■ Fire Flow Storage for 1,750 gpm (based on 120 min):	210,000 gallons
Total storage requirement for indoor use:	238,600 gallons

According to the recently completed water master plan, DWP has sized its storage facilities to provide a maximum fire flow of 1,500 gpm with a two-hour duration for residential development. Additional storage to provide incremental fire flow requirements would be the responsibility of individual developers in each of the pressure zones impacted. In the case of Tract 16136, the incremental fire flow of 250 gpm (1,750 gpm – 1,500 gpm) results in an additional storage requirement of 30,000 gallons. Storage requirements for operational and emergency storage are provided by the DWP as part of the meter connection charges.

Existing storage facilities in the Upper Fawnskin pressure zone consist of a single 0.25 million gallon reservoir that is fed by a combination of slant wells, located in the vicinity of the reservoir site, and the Cline Miller booster station that supplies water from the Lower Fawsnkin pressure zone. The existing reservoir capacity is adequately sized to meet current storage requirements of existing users while providing fire flow protection for a flow rate of 1,500 gpm over a two-hour duration. Current storage requirements in this zone are estimated at approximately 225,000 gallons; this value is approximately 10 percent below existing storage capacity.

An additional storage of 30,000 gallons would be required in the Upper Fawnskin pressure zone to supply the recommended 1,750 gpm fire flow over a two-hour duration. This additional storage could be provided by either constructing a second reservoir adjacent to the existing Racoon Reservoir or conveying surplus storage capacity in the Lower Fawnskin pressure zone through the existing Cline Miller booster station. This booster station consists of two booster units with a combined capacity of approximately 190 gpm. To make surplus storage from the Lower Fawnskin pressure zone available during power outages, a backup generator at the Cline Miller booster station would be needed. In addition, the capacity of the existing booster station would need to be increased to pump 303 gpm. This flow rate represents a combination of a) estimated maximum day demand at full development in the Upper Fawnskin pressure zone of 38 gpm, b) estimated maximum day demand of 15 gpm from tract 16136, and c) 250 gpm of incremental fire flow into the Upper pressure zone.

Alternatives to Serve Proposed Tract 16136

Under average and peak summer demands, the proposed development could be served by simply extending existing facilities in the Upper Fawnskin pressure zone. The closest facility in this pressure zone that the development can be connected to consist of a 6-inch pipeline in the vicinity of Flicker Road and Chinook Road. However, existing distribution facilities would not be able to provide the required fire flow capacity needed to protect future residential development in the area. Existing system facilities consist of pipelines ranging in size from 2 to 8 inches in diameter with limited fire flow carrying capacity.

To provide the fire flow requirements indicated by the Office of the Fire Marshall, transmission improvements will be required in the Upper Fawnskin pressure zone. Two alternatives were evaluated to serve the proposed development; a brief description of these alternatives and the required facilities is presented below. Figure 1 illustrates the alignment of proposed transmission facilities for each alternative and the recommended pipelines within the proposed residential tract.

Facilities Common to Both Alternatives. Transmission facilities south of the intersection of Flicker Road and Mesquite Drive to the westerly boundary of the proposed tract are common to both alternatives and consist of approximately 700 ft of 12-inch diameter pipeline. The alignment of this pipeline is shown in Figure 1.

Alternative A. This alternative consists of serving the proposed tract by constructing a dedicated 12-inch transmission pipeline from the vicinity of the Cline Miller Reservoir to the proposed development site. This alternative would also require the construction of a fire booster station at the Cline Miller Reservoir site to augment the capacity of the existing booster units as they are not adequate to provide the recommended fire flow capacity into the Upper Fawnskin pressure zone. To assure that the fire booster unit is operational during power outages, the installation of a 200 kilowatt on-site electric generator is recommended.

The alignment of the recommended transmission pipeline between the Cline Miller Reservoir and the intersection of Flicker Road and Mesquite Drive is depicted in Figure 1. The estimated length of this pipeline is approximately 2,450 ft.

Alternative B. This alternative consists of serving the proposed development by gravity off the existing Racoon Reservoir. Transmission improvements in the Upper Fawnskin pressure zone would be required as existing distribution facilities have limited fire flow carrying capacity; they consist primarily of small pipelines ranging in size from 2 to 8 inches in diameter. Recommended improvements consist of a series of 12-inch segments between the reservoir site and the intersection of Flicker Road and Mesquite Drive as illustrated in Figure 1. The estimated combined length of proposed facilities is approximately 2,800 ft.

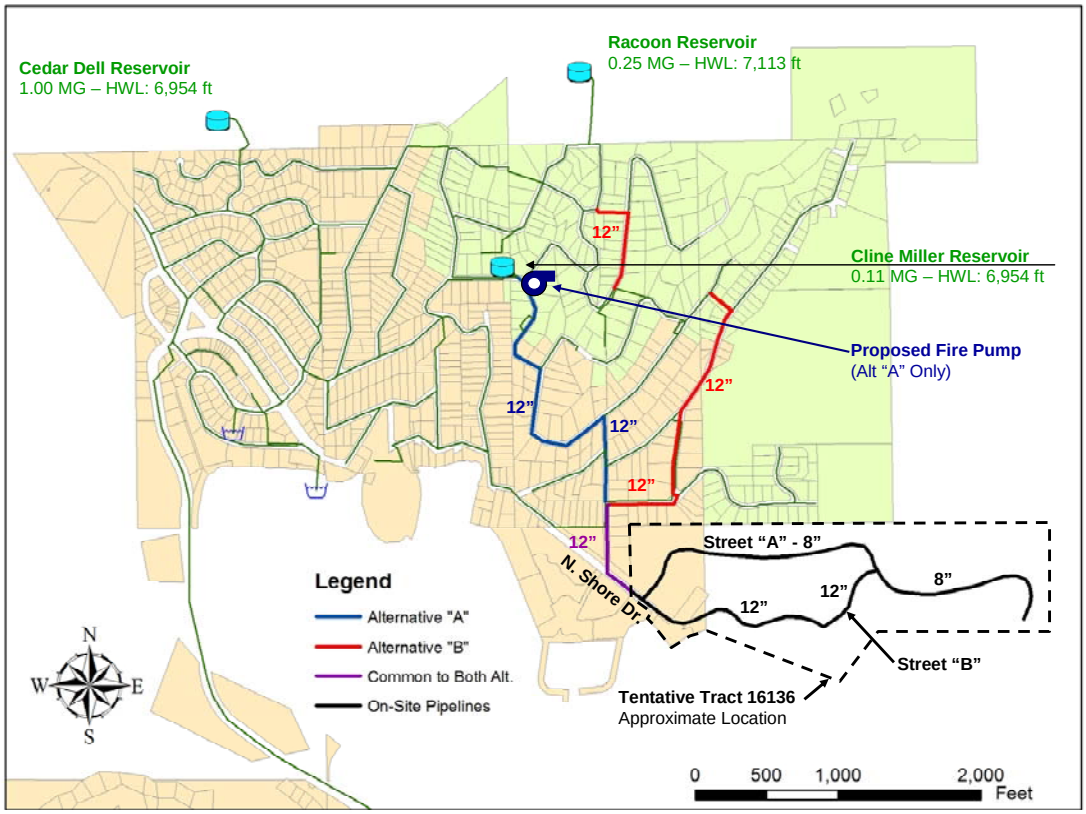


Figure 1
Tentative Tract 16136 - Recommended Facilities Both Alternatives

Alternative "B" would not require the construction of a fire pump at the Cline Miller Reservoir to pump from the Lower to the Upper Fawnskin pressure zone as the majority of the fire flow would be provided by gravity off the existing Racoon Reservoir. However, the existing Cline Miller booster station would have to be refurbished to increase its capacity to convey surplus storage from the Lower Fawnskin pressure zone during a fire flow event. The capacity of this booster station would be increased from its current capacity of 190 gpm to 303 gpm. In addition, an on-site generator would be required to operate the station during power outages. The enhancement of this booster station would eliminate the need to construct additional storage facilities in USFS lands, which are difficult to obtain approval for.

On-Site Facilities. The sizing of pipelines within the proposed tract is the same for both alternatives. Recommended pipeline diameters for the various street segments shown in Figure 1 are described as follows:

- North Shore Dr. from tract boundary to Street "A": 150 ft of 12-inch pipeline
- North Shore Dr. from Street "A" to Street "B": 1,600 ft of 12-inch pipeline
- Street "B" from North Shore Dr. to Street "A": 700 ft of 12-inch pipeline
- Street "A" from North Shore Dr. to Street "B": 2,000 ft of 8-inch pipeline
- Street "A" from Street "B" to end of Cul-de-sac: 1,500 ft of 8-inch pipeline

Estimated Cost of Improvements

The capital cost of proposed improvements was based on construction information provided by DWP and from other construction cost information available. The estimated cost of construction for pipelines is estimated at $15 per diameter inch; the cost for pump stations is estimated at $2,500 per horsepower. Construction contingencies are estimated at 20 percent while engineering cost is estimated at 15 percent.

It should be noted that estimated capital cost of proposed improvements shown here is for planning purposes only; actual cost of improvements may vary significantly depending on materials and labor cost at the time of construction.

Alternative "A" – Dedicated line from the Cline Miller Reservoir

■ 2,450 ft of 12-inch diameter off-site pipeline	$ 440,000
■ 700 ft of 12-inch diameter off-site – Common to both Alt.	$ 130,000
■ 175 Hp Cline Miller booster fire pump	$ 440,000
■ 200 KW on-site emergency generator (1)	$ 65,000
Sub-total:	$ 1,075,000
Contingency during construction – 20 percent	$ 215,000
Engineering, administration, inspection – 15 percent	$ 165,000
Overall construction cost for off-site improvements	$ 1,455,000

(1) Capital cost estimate includes cost of generator and transfer switch.

Alternative "B" – Gravity flow from the Racoon Reservoir

■ 2,800 ft of 12-inch diameter off-site pipeline	$ 505,000
■ 700 ft of 12-inch diameter off-site – Common to both Alt.	$ 130,000
■ Refurbishing of existing Cline Miller booster station	$ 100,000
■ 50 KW on-site emergency generator (1)	$ 35,000
Sub-total:	$ 770,000
Contingency during construction – 20 percent	$ 155,000
Engineering, administration, inspection – 15 percent	$ 115,000
Overall construction cost for off-site improvements	$ 1,030,000

(2) Capital cost estimate includes cost of generator and transfer switch.

Recommendations

The implementation of either alternative should provide the proposed development with the necessary facilities to meet the recommended fire flow protection of 1,750 gpm during maximum day demand conditions. However, Alternative "B" is preferred because it also enhances the distribution and fire flow capacity of the existing system in the Upper Fawskin pressure zone. In addition, the implementation of this alternative is approximately 29 percent less expensive than Alternative "A".

Disclaimer

This feasibility study is based on current system conditions and it is valid for a period of 12 months from the date of this letter. The feasibility of developing the Tract 16136 subdivision may need to be revised and/or reassessed if the project is delayed for a significant period of time. Revisions may result from changes in future water demands, system conditions, and construction cost of recommended facilities.

Should you have any questions, please contact us at 909-587-9916 during normal business hours.

Very truly yours

ALDA Engineering Inc.

F. Anibal Blandon, P.E.
Principal

G.3 - Results of Rehabilitation and Aquifer Testing Well FP-Z (California Collaborative Solutions, August 2008)

California Collaborative Solutions
Results of Rehabilitation and Aquifer Testing
Moon Camp Well FP-2

August 7, 2008

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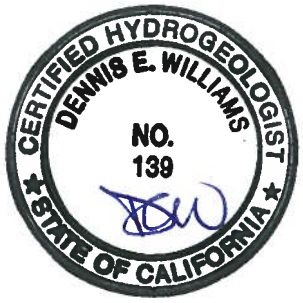
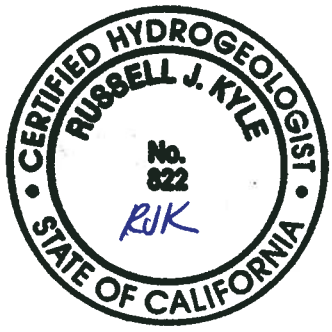


Dennis E. Williams, Ph.D., PG, CHG



Russell J. Kyle, PG, CHG

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CALIFORNIA COLLABORATIVE SOLUTIONS
RESULTS OF REHABILITATION AND AQUIFER TESTING
MOON CAMP WELL FP-2

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B	Water Quality Data
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CALIFORNIA COLLABORATIVE SOLUTIONS
RESULTS OF REHABILITATION AND AQUIFER TESTING
MOON CAMP WELL FP-2

1.0 INTRODUCTION

This report summarizes the results of rehabilitation and testing of Well FP-2, located in the vicinity of the proposed Moon Camp development, east of Fawnskin, California (see Figures 1 and 2). Well FP-2 is a potential water source for the development, however, prior to recent activities, it had not been pumped since its construction in 1987. In order to assess the suitability of the well for water supply, GEOSCIENCE developed and implemented a well rehabilitation and testing program.

1.1 Purpose and Scope

The purpose of rehabilitation and testing of Moon Camp Well FP-2 was to:

1) Assess the current condition of the well;

2) Develop a rehabilitation program adequate to restore the specific capacity of the well so that its potential yield and water quality could be evaluated;

3) Implement the rehabilitation and testing program; and

4) Collect and analyze the data necessary for evaluating aquifer characteristics including water quality, potential interference to nearby wells, and possible hydraulic continuity with Big Bear Lake.

The scope of work to address the objectives included:

1) Conducting a downhole video survey of the well;

2) Developing a rehabilitation and testing program and coordinating implementation of the program with a rehabilitation contractor;

3) Implementing the rehabilitation program;

4) Conducting a 72-hour aquifer pumping test;

5) Collecting ground water quality samples from the well and having them analyzed for full Title 22 suite and microscopic particulate analysis (MPA); and

6) Analysis of the data and preparation of the report.

1.2 Background

The Moon Camp Well FP-2 was drilled in 1987 by Howard Pump Company of Barstow, California, using the mud rotary drilling method. A 17-inch borehole was drilled to a depth of 50 ft below ground surface (bgs), below which a 15-inch borehole was drilled to the total depth of 385 ft bgs. Well casing and screen, consisting of 8 1/8-inch inside diameter (ID) mild steel with a 1/4-inch wall thickness was installed to a total depth of 380 ft bgs. The screened portion of the well consists of Johnson Hi-Cap, a type of wire-wrap, located at depths of 60 to 120, 156 to 176, 216 to 278, and 310 to 370 ft bgs. The well was equipped with a 2-inch sounding tube that attaches to the well casing just below the ground surface. The well was filter packed using an 8 x 16 Monterey Sand from the total borehole depth to 53 ft bgs. A 2-foot bentonite layer was placed above the filter pack from 51 to 53 ft bgs and a cement annular seal was placed above the bentonite layer from 51 ft bgs to the ground surface.

Following well construction, the well was developed by bailing and pumping. Following development, an 8-hour variable rate (step drawdown) test was performed. During this test, a maximum discharge rate of 100 gallons per minute (gpm) was achieved with a pumping water level of 26 ft bgs. The specific capacity calculated from data collected during this test was approximately 5 gpm per foot of drawdown.

2.0 DOWNHOLE VIDEO SURVEY

On May 2, 2008, Pacific Surveys, LLC, conducted a downhole video survey of Well FP-2. GEOSCIENCE personnel were on site to note observations made during the survey and to direct the operation of the camera as necessary.

At the time of the video survey, the depth to static ground water level was approximately 2 ft bgs. The camera reached a depth of approximately 376 ft bgs before visibility within the water column became so reduced (i.e. blackout conditions) as to warrant the removal of the camera.

The video survey showed that the blank well casing and screen was locally scaled and corroded although no obvious structural damage was observed. The blank well casing was coated with moderate to heavy scale, with encrustants occurring in localized patches, particularly along welded casing joints. Large mounds of encrustants became more frequent and larger with depth. The wire-wrapped screen sections showed minor to complete clogging with some localized patches of encrustants and tubercles. Where screens were open, no filter pack could be seen through the screen apertures. Some of the encrusting material was observed to be relatively fragile and brittle and became dislodged from contact with the video camera.

3.0 WELL REHABILITATION PROCEDURE

Based on review of the video log, GEOSCIENCE developed a chemical and mechanical rehabilitation program for Well FP-2[1]. Rehabilitation was performed by Roadrunner Drilling & Pump Company of Winnemucca, Nevada (Contractor). The rehabilitation program was initiated on June 27, 2008.

Initial rehabilitation of Well FP-2 included mechanical dislodging of encrusted material throughout the wetted portion of the well casing and screen using a spirally-wound nylon brush. Scale and debris were dislodged by gently raising and lowering the brush throughout the specified area. The Contractor brushed each wetted foot of blank well casing for one minute and each wetted foot of screen for two minutes, for a total of 10 hours brushing time. Following brushing, a bailer was used to remove material that had accumulated at the bottom of the well.

The well was disinfected through a combination of acidification and chlorination. Using a tremie pipe, acid was introduced throughout the length of the well. The acid was mixed into the screened portion by gently lifting and lowering a bailer tool. Once the pH of the well water had been lowered to approximately 4.5 pH units, a chlorine solution was added through the tremie pipe and worked into the screened portion of the well by lifting and lowering the bailer. Once the chlorine concentration of the water in the well exceeded 200 milligrams per liter (mg/L), the well was allowed to sit idle for 24 hours.

Following chlorination, the Contractor continued rehabilitation of Well FP-2 using a combination swab and airlift tool. Swabbing was accomplished by gently lifting and lowering the double-packer tool opposite 10-foot sections of the well screen, effectively dislodging any remaining biofilm and/or fine-grained sediment from the gravel pack and near well zone. Following several passes with the swab tool through a 10-foot screened interval, the interval was

[1] Letter to Michael Perry dated May 9, 2008

pumped (air lifted) using the tool until the discharged water was clear and free of sediment. The screened portion of the well was swabbed and airlifted for a total of 20 hours.

Following swabbing and airlifting, a submersible test pump was installed within the well for final development and testing. The test pump intake was installed at a depth of approximately 130 ft bgs. Initial pumping was performed at a relatively low flow rate (approximately 30 gpm) and was gradually increased as water clarity improved and sand production decreased. Pumping was periodically interrupted to surge the well, a process where water in the pump column is allowed to flow back into the screened section of the well. This process was repeated until the discharge water was clear and the sand content was less than 0.1 parts per million (ppm). The well was developed by pumping for approximately 11 hours. The maximum discharge rate during development was approximately 150 gpm with approximately 25 feet of drawdown.

4.0 AQUIFER PUMPING TEST

A 72-hour variable rate (step-drawdown) pumping test was conducted at Well FP-2 during the period from July 1 to 4, 2008. The well was pumped in 24-hour "steps" at average discharge rates of 35 gpm, 60 gpm and 105 gpm (see Figure 3). During the pumping test, the pumping water level, discharge rate, and sand content were closely monitored (see Appendix A). Ground water levels in a nearby private well, referred to as the Fujimoto Well (see Figure 2), were also monitored during the pumping test. The pumping test was followed by 4 hours of recovery measurements in both the pumping well and the observation well. The field procedure for the pumping test followed the American Society for Testing and Materials (ASTM, 1994), Standard Test Method D4050.

4.1 Pumping Test Methodology

4.1.1 Basic Assumptions Used in Analysis of Pumping Test Data

The purpose of a pumping test is to obtain field data, which when substituted into an equation or set of equations, will yield estimates of well and aquifer properties. As certain assumptions have been used to derive these equations, it is important to consider or control these factors during the test. These assumptions are:

- The aquifer material is assumed to consist of porous media, with flow velocities being laminar and obeying Darcy's law.
- The aquifer is considered to be homogeneous, isotropic, of infinite aerial extent, and of constant thickness throughout.
- Water is released from (or added to) internal aquifer storage instantaneously upon change in water level.

- No storage occurs in the semi-confining layers of leaky aquifers.
- The storage in the well is negligible.
- The pumping well penetrates the entire aquifer and receives water from the entire thickness by horizontal flow.
- The slope of the water table or piezometric surface is assumed to be flat during the test with no natural (or other) recharge occurring, which would affect test results.
- The pumping rate is assumed constant during the entire time period of pumping during a constant-rate test, and constant during each discharge step in a variable-rate test.

4.1.2 Theis Equation

Estimation of aquifer parameters from pumping test data is based on analytical solutions of the basic differential equation of ground water flow that can be derived from fundamental laws of physics. One of the most widely used solutions of this equation for non-steady radial flow to wells is the "Theis Equation":

$$s(r,t) = \frac{114.6Q}{T} W(u) \qquad \text{"Theis Equation"} \qquad (1)$$

where:

s(r,t) = Drawdown in the vicinity of an artesian well, [ft]

r = Distance from pumping well, [ft]

Q = Discharge rate of pumping well, [gpm]

T = Transmissivity of aquifer, [gpd/ft]

W(u) = "Well function of Theis"

$u = \frac{1.87r^2S}{Tt}$

where:

S = Storativity, [fraction]

t = Time after pumping started, [days]

4.1.3 Jacob's Straight-Line (Modified Theis Non-Equilibrium) Method

According to Jacob (1950), for small values of "u" (u < 0.05), the Theis equation may be approximated by Jacob's equation:

$$s(r,t) = \frac{264Q}{T}\log\left(\frac{0.3\,Tt}{r^2 S}\right) \qquad \text{"Jacob's Equation"} \qquad (2)$$

Jacob's equation is valid for use for most hydrogeologic problems of practical interest, is easier to use than the Theis equation, and involves a simple graphical procedure to estimate transmissivity and storativity. This method (D 4105) is summarized by ASTM (1994).

Transmissivity (T, in gpd/ft) can be estimated as:

$$T = \frac{264Q}{\Delta s} \qquad (3)$$

where:

Q = Pumping rate, [gpm]

Δs = Change in drawdown over one log cycle of time, [ft]

4.2 Pumping Well

Well FP-2 served as the pumping well for the 72-hour constant rate pumping test. The static ground water level in the well was measured to be approximately 6 ft bgs prior to the start of pumping. Ground water levels were measured during the pumping test and recovery phase using a downhole pressure transducer programmed to collect measurements at one-minute intervals. Additionally, an electric wireline sounder was used to manually collect ground water levels in FP-2 during the pumping and recovery phases.

The discharge rate was monitored with a flowmeter equipped with a totalizer and instantaneous rate gauge. During the course of the 72-hour pumping test, Well FP-2 pumped at average discharge rates of 35, 60, and 105 gpm (Steps 1, 2, and 3, respectively). The total volume of ground water pumped during testing was 289,350 gallons.

Ground water samples were collected during the 72-hour step test after approximately 44 hours of pumping (July 2, 2008). The samples were submitted to E.S. Babcock & Sons, Inc. of Riverside, California for analysis of constituents required by the State of California Code of Regulations Title 22 Rule as well as other selected constituents. A complete list of the constituents tested and their detection limits are provided in Table 1. Laboratory results of the water quality testing are presented in Appendix B.

A microscopic particulate analysis (MPA) was performed during the first 24 hours of the step drawdown test. After approximately 1,000 gallons of discharge water were run through a filtering apparatus, the filter was submitted to BioVir laboratories, Inc. of Benicia, California. The sample was analyzed according to EPA Method 910/9-92-029 including *Giardia* species and *Cryptosporidium*. Results of the MPA are presented in Appendix C.

4.3 Observation Well

Ground water levels were monitored before, during and after the pumping test in an observation well (a private well referred to as the Fujimoto Well) located approximately 910 ft east of Well FP-2. Water level measurements were collected and recorded in this well using a pressure transducer.

5.0 PUMPING TEST RESULTS

5.1 Production Well (FP-2)

As shown on Figure 3, Well FP-2 can be pumped at a rate of 35 gpm on a long-term basis with less than 10 ft of drawdown in the well. The well can also sustain a pumping rate of 105 gpm on a long-term basis although the rate of ground water level decline is greater. Analysis of the 105 gpm step using Jacob's straight-line interpretation shows an aquifer transmissivity of approximately 14,600 gallons per day per foot of drawdown (gpd/ft; see Figure 4). At a pumping rate of 105 gpm, the specific capacity of FP-2 is approximately 4.7 gpm/ft.

The specific capacity (the inverse of specific drawdown), of the well during Step 1 was less than the specific capacity measured during Steps 2 and 3. This results in a negative trendline when plotting specific drawdown with discharge rate, and thus, well efficiency cannot be calculated (see Figure 5).

Calculated recovery is a method of analysis whereby extrapolated drawdown data is compared to actual recovery data from the pumping well. It can be used to calculate transmissivity using Jacob's straight line interpretation in a similar manner as used with the pumping drawdown data. Results of the calculated recovery analysis for well FP-2 shows an aquifer transmissivity of approximately 8,900 gpd/ft (see Figure 6). Residual drawdown analysis, a method whereby residual drawdown (the difference between the static and recovering water level) is plotted with respect to the ratio between the time since pumping stopped and the time since pumping started, can also be used for calculating aquifer transmissivity using Jacob's straight line interpretation. Results of the residual drawdown analysis for Well FP-2 shows an aquifer transmissivity of approximately 9,600 gpd/ft (see Figure 7).

5.2 Observation Well

Ground water level data collected from the observation (Fujimoto) well, located approximately 910 ft east of Well FP-2, during the pumping test shows minor ground water pumping interference that can be attributed to pumping of Well FP-2. Given that the Fujimoto well was an actively pumping well that cycled on and off periodically during the pumping test, it was necessary to interpret pumping interference from Well FP-2 through the ground water level "noise" of the pumping observation well. To account for this, static ground water levels were used to interpret interference trends (see Figure 8). Interpretation of static ground water trends during the pumping test shows a decline of approximately 0.3 ft that can be attributed to interference from pumping Well FP-2 at a rate of 35 gpm.

5.3 Ground Water Quality

Ground water quality data from Well FP-2 indicate that water produced from the well is suitable for municipal supply. The water is of calcium-bicarbonate type (see Figure 9). The total dissolved solids (TDS) concentration was reported to be 300 mg/L, below the recommended California Department of Public Health (CDPH) secondary maximum contaminant level (MCL) of 500 mg/L. Toluene was detected at a concentration of 1.2 micrograms per liter (µg/L), below the CDPH primary MCL of 150 µg/L, and is likely from materials used during installation of the test pump. Chloroform was detected at a concentration of 0.98 µg/L, below the USEPA MCL of 80 µg/L for trihalomethanes, and is likely a by-product of the chlorine used during rehabilitation of the well casing and screen. All other detected constituents were below their respective MCLs or notification levels.

The results of the water quality analyses are summarized in the following table:

Water Quality Analytical Data – Moon Camp Well FP-2

		Analysis Result	Drinking Water Regulatory Standards
Aluminum	**[µg/L]**	< 50	200[2]/1,000[1]
Arsenic	**[µg/L]**	< 2.0	10[1]
Boron	**[µg/L]**	< 100	1,000[3]
Chloride	**[mg/L]**	2.7	250-500[2]
Chromium, Hexavalent	**[µg/L]**	< 1.0	50[1,4]
Chromium, Total	**[µg/L]**	1.1	50[1]
Color	**[Color Units]**	< 3.0	15[2]
Fluoride	**[mg/L]**	< 1.0	2.0[1]
Iron	**[µg/L]**	< 100	300[2]
Manganese	**[µg/L]**	< 20	50[2]
Nitrate (as NO_3^-)	**[mg/L]**	< 1.0	45[1]
Odor	**[TON]**	< 1.0	3[2]
Perchlorate	**[µg/L]**	< 4.0	6.0[1]
pH	**[pH Units]**	7.5	6.5 - 8.5[5]
Silica, Total	**[mg/L]**	25	NA[6]
Specific Conductance	**[µmhos/cm]**	510	900-1,600[2]
Sulfate (as SO_4)	**[mg/L]**	5.2	250-500[2]
Surfactants (MBAS)	**[mg/L]**	< 0.05	0.5[2]
Total Dissolved Solids (TDS)	**[mg/L]**	300	500 - 1,000[2]
Total Hardness	**[mg/L]**	270	NA[6]
Turbidity	**[NTU]**	0.39	5[2]
Vanadium	**[µg/L]**	< 3.0	50[3]
1,2,3-Trichloropropane	**[µg/L]**	< 0.005	0.005[3]
Gross Alpha	**[pCi/L]**	1.74 +/- 1.33	15[1]
Radon	**[pCi/L]**	447 +/- 43.1	300-4,000[7]
Volatile Organic Compounds (EPA Method 524.2) except as noted below:	**[µg/L]**	ND	Varies with Chemical[1]
Chloroform	**[µg/L]**	0.98	80[8]
Toluene	**[µg/L]**	1.2	150[1]

1 California Department of Public Health (CDPH) primary maximum contaminant level (MCL).
2 CDPH secondary MCL.
3 CDPH notification level for unregulated chemicals.
4 Chromium-6 (hexavalent chromium) is regulated by CDPH under the 50 µg/L total chromium MCL.
5 United States Environmental Protection Agency (USEPA) secondary standard for pH.
6 Not Applicable – no current MCL.
7 USEPA proposed MCL and alternative MCL
8 Chloroform is regulated under the 80 µg/L USEPA MCL for total trihalomethanes.
ND Not detected above laboratory detection limit.
BOLD Equal to or above current CDPH MCL or notification level.

5.4 Microscopic Particulate Analysis

Microscopic particulate analysis (MPA) did not show any primary or secondary particulates in the well discharge, with the exception of plant pollen. The plant pollen identified was determined to be pine pollen, and is likely an airborne contaminant that contacted the sampling apparatus during field set-up. Given this, there is no evidence from the MPA that the ground water produced by Well FP-2 is under the direct influence of surface water in Big Bear Lake. A copy of the complete MPA report is presented in Appendix C.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the data collected during this investigation, we have developed the following conclusions:

- Well FP-2 has successfully been rehabilitated and its specific capacity restored to near original levels;
- Extreme care should be exercised when equipping or redeveloping the well in the future to avoid damaging the wire-wrap screen. Although no clear damage was visible from the video survey, the screen design is fragile and can easily be damaged;
- Well FP-2 can yield up to 35 gpm on a long-term basis with less than 10 ft of drawdown;
- At the 35 gpm discharge rate, pumping interference with the closest private well is expected to be less than 0.3 ft;
- Ground water quality data from Well FP-2 indicates the water from the well is suitable for municipal supply;
- Microscopic particulate analysis of discharge water detected pine pollen on the sampling filter. However, the detection was likely the result of an airborne contaminant and not from ground water under the direct influence of surface water. Confirmation sampling and analysis may be necessary to verify this conclusion prior to permitting the well with the CDPH.

7.0 REFERENCES

American Society for Testing and Materials, 1994. ASTM Standards on Ground Water and Vadose Zone Investigations. 2nd Edition.

Jacob, C.E., 1950. Engineering Hydraulics. J. Wiley and Sons, New York.

Driscoll, Fletcher G., 1986. Groundwater and Wells. Second Edition. U.S. Filter/Johnson Screens, St Paul Minnesota.

FIGURES

CALIFORNIA COLLABORATIVE SOLUTIONS

RESULTS OF REHABILITATION AND AQUIFER TESTING MOON CAMP WELL FP-2

T.3 N.
T.2 N.

Grout Creek Subunit

Moon Camp Well FP-2

Fujimoto Well

North Shore Subunit

Gray's Landing

Village Subunit

Rathbone Subunit

Mill Creek Subunit

R.1 W. | R.1 E.

7-Aug-08

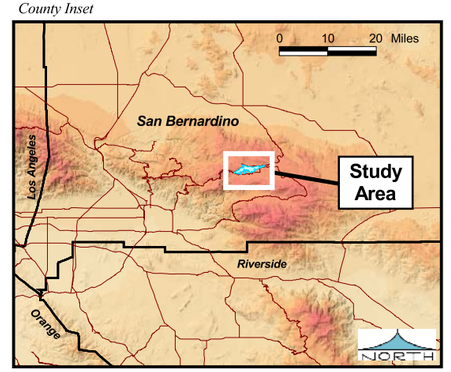
GENERAL LOCATION

EXPLANATION

Well Location

Hydrologic Subunit Boundary

County Inset



NORTH

0 2000 4000 Feet

Prepared by: DWB

Map Projection:
UTM Zone 11, NAD27
Central Meridian: -117 degrees

GEOSCIENCE

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Figure 1

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CALIFORNIA COLLABORATIVE SOLUTIONS

RESULTS OF REHABILITATION AND AQUIFER TESTING MOON CAMP WELL FP-2

DETAILED LOCATION

EXPLANATION

Moon Camp Well FP-2 and Fujimoto Well Locations

Well Classification

- Municipal
- Private
- Test Well

Well Status

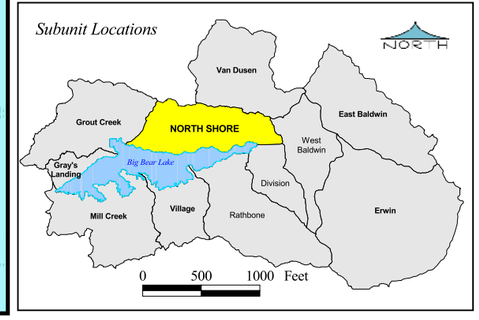
- Abandoned
- Destroyed
- Non-Pumping
- Pumping
- Unknown

Example: = Pumping Municipal Well

Hydrologic Subunit Boundary

Creek or Drainage Channel

Subunit Locations



7-Aug-08

Prepared by: DWB

Map Projection:
UTM 1927 (Zone 11)
Central Meridian: -117 degrees

Base Map from:
USGS 7 1/2 minute Big Bear City (1994)
and Moonridge (1994) Quadrangles.

NORTH
0 1000 2000 Feet

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Figure 2

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Step Drawdown Test
Moon Camp Well FP-2

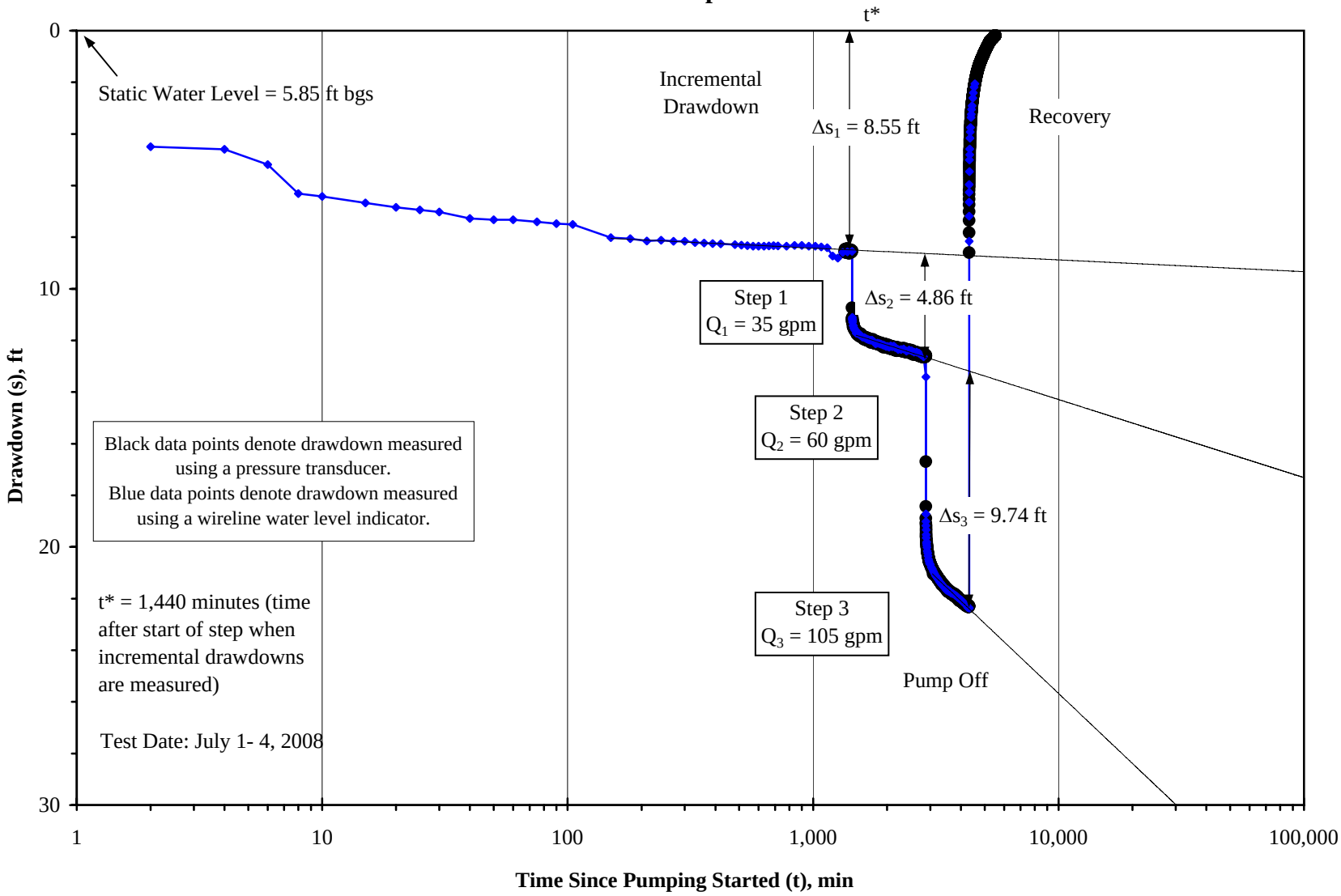


Figure 3

Step Drawdown Test - Step 3 (105 gpm)
Moon Camp Well FP-2

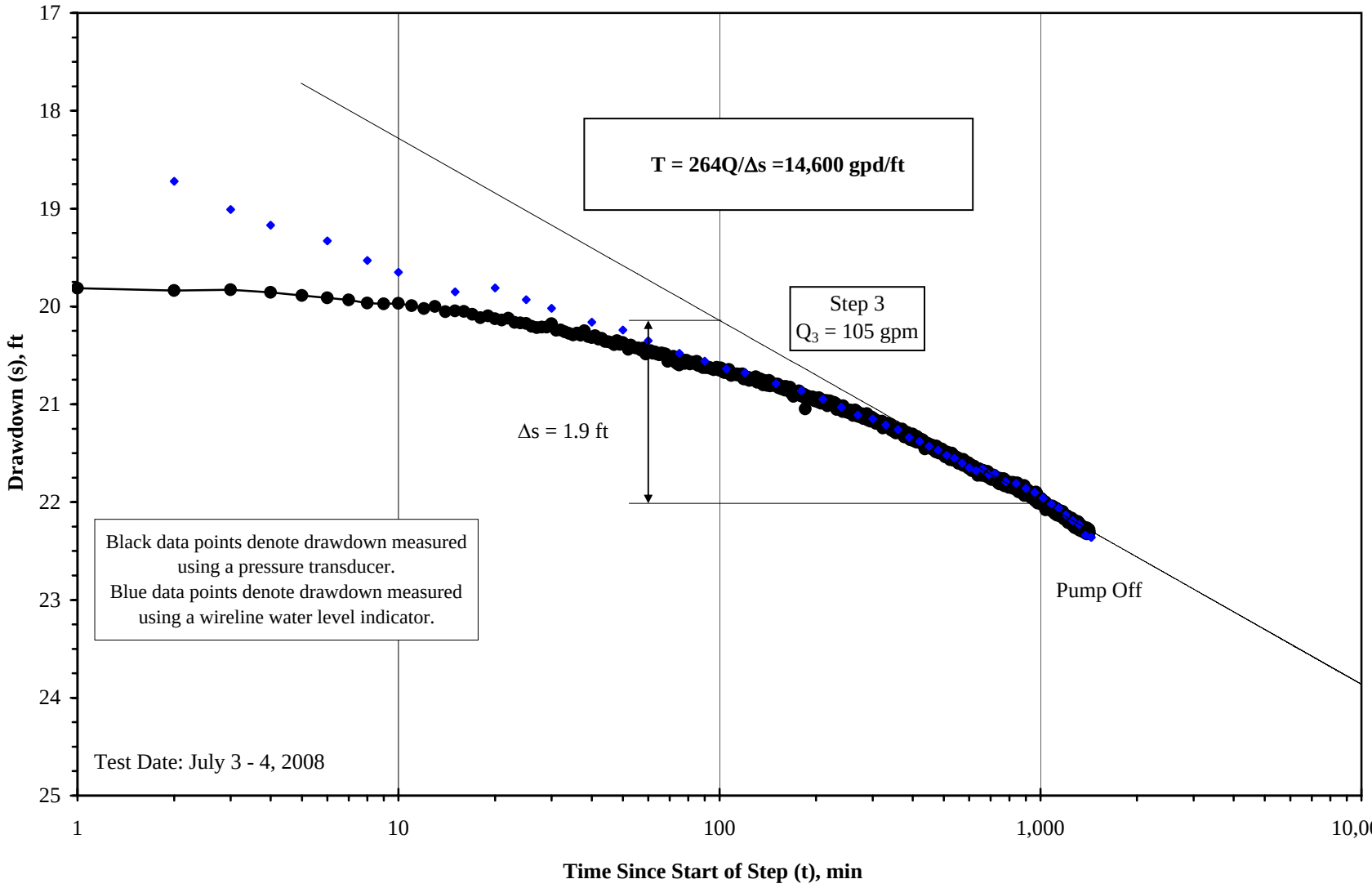


Figure 4

Specific Drawdown
Moon Camp Well FP-2

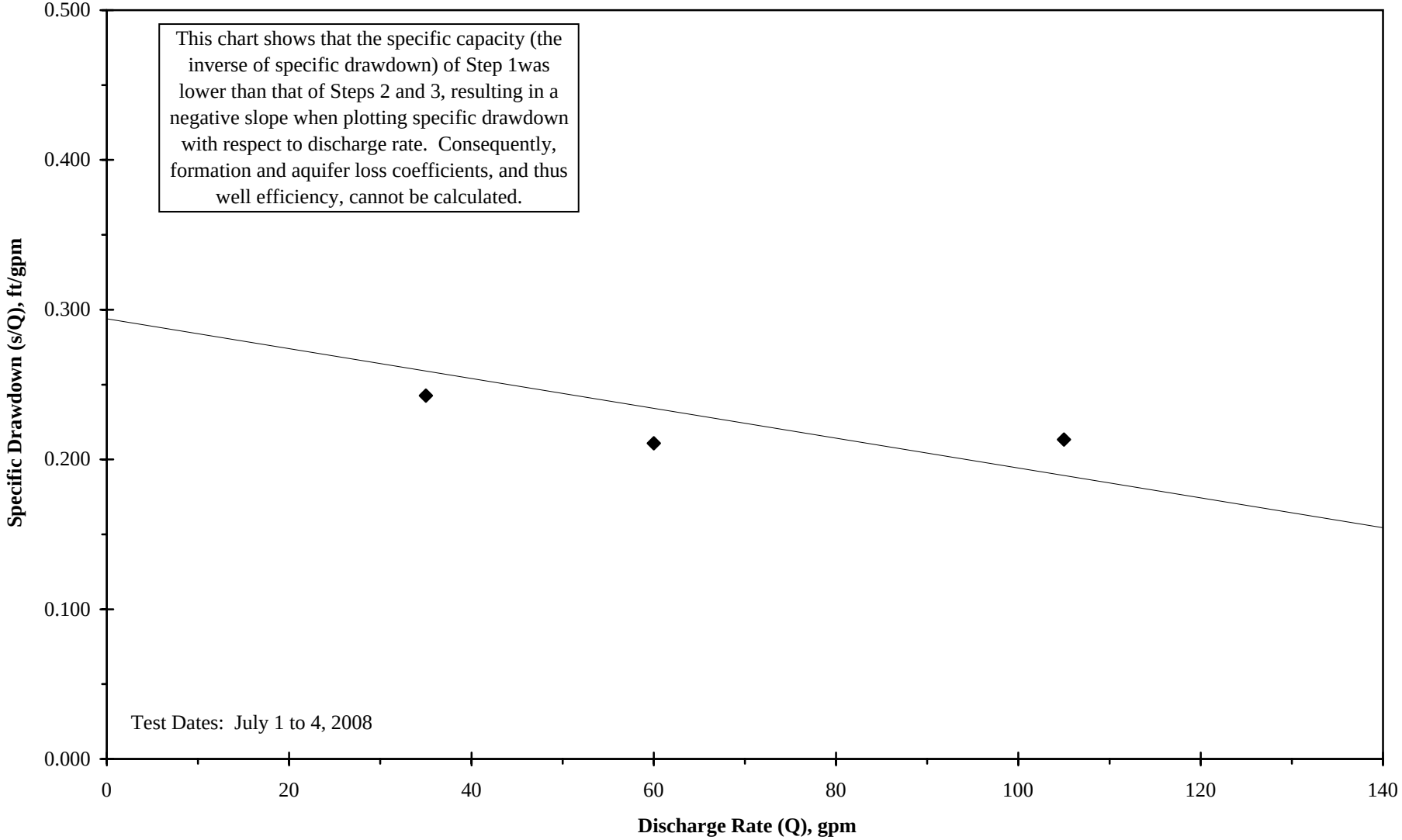


Figure 5

Calculated Recovery
Moon Camp Well FP-2

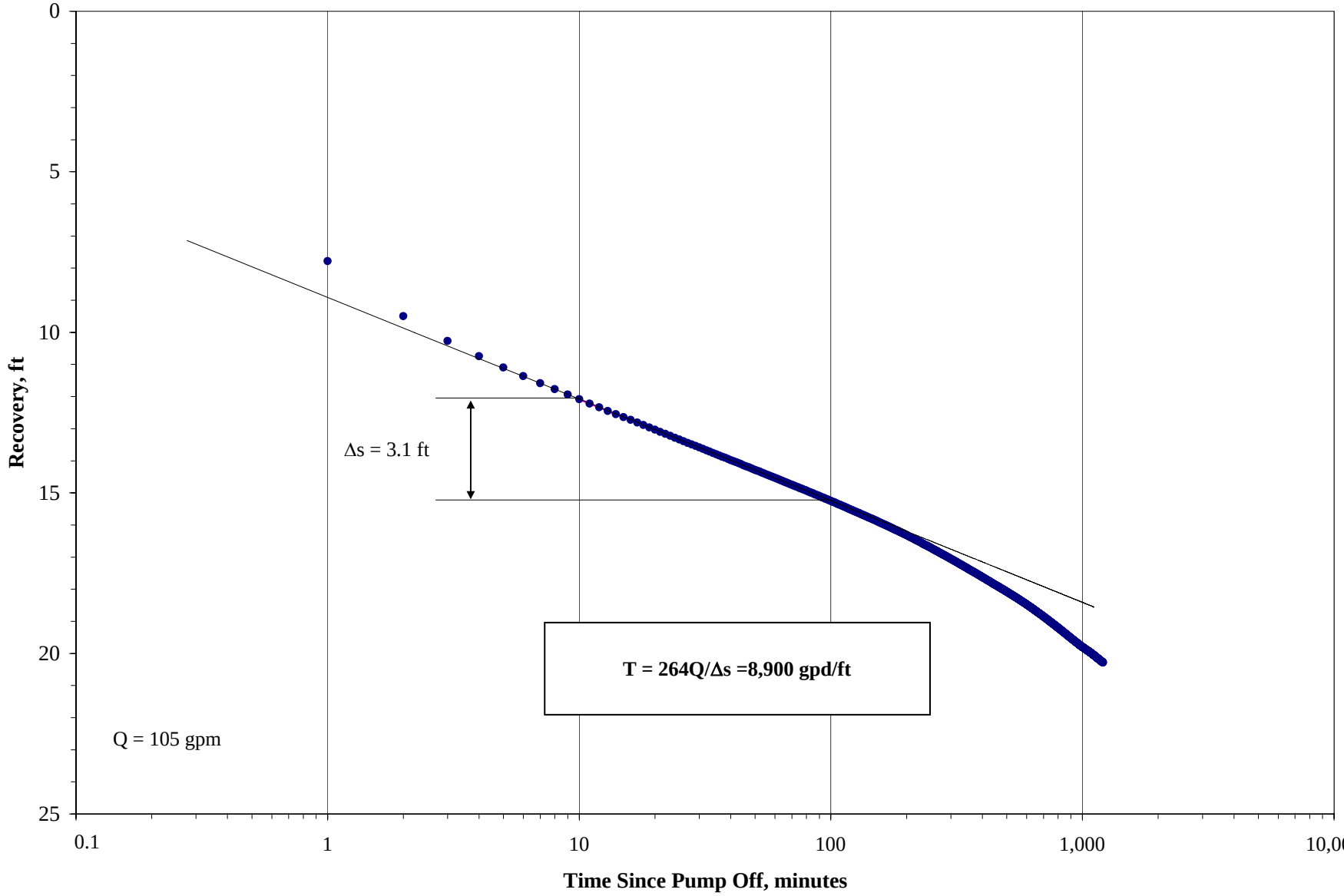


Figure 6

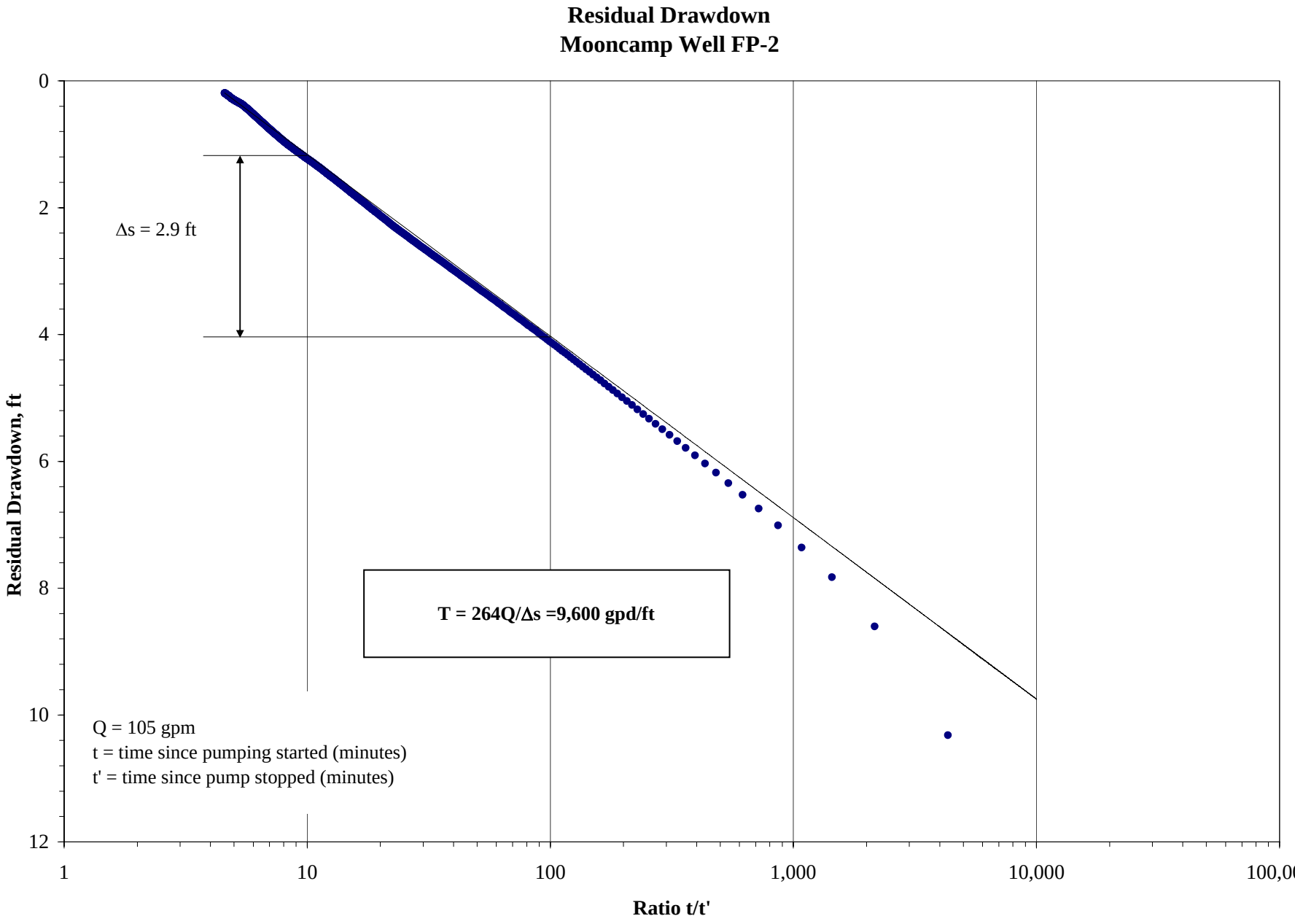

Residual Drawdown
Mooncamp Well FP-2
Residual Drawdown, ft
0
2
4
6
8
10
12
Δs = 2.9 ft
T = 264Q/Δs =9,600 gpd/ft
Q = 105 gpm
t = time since pumping started (minutes)
t' = time since pump stopped (minutes)
1
10
100
1,000
10,000
100,000
Ratio t/t'

Figure 7

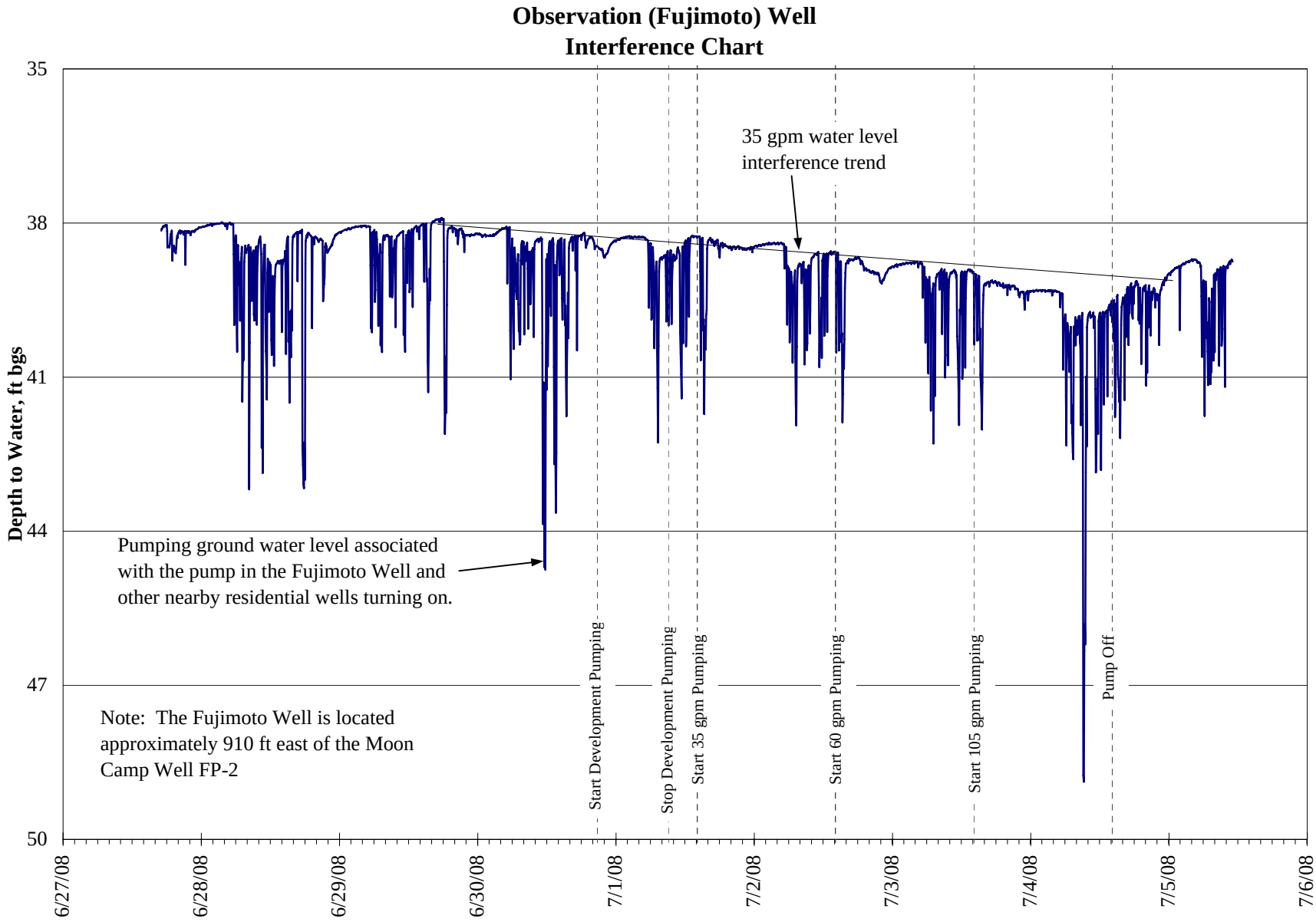
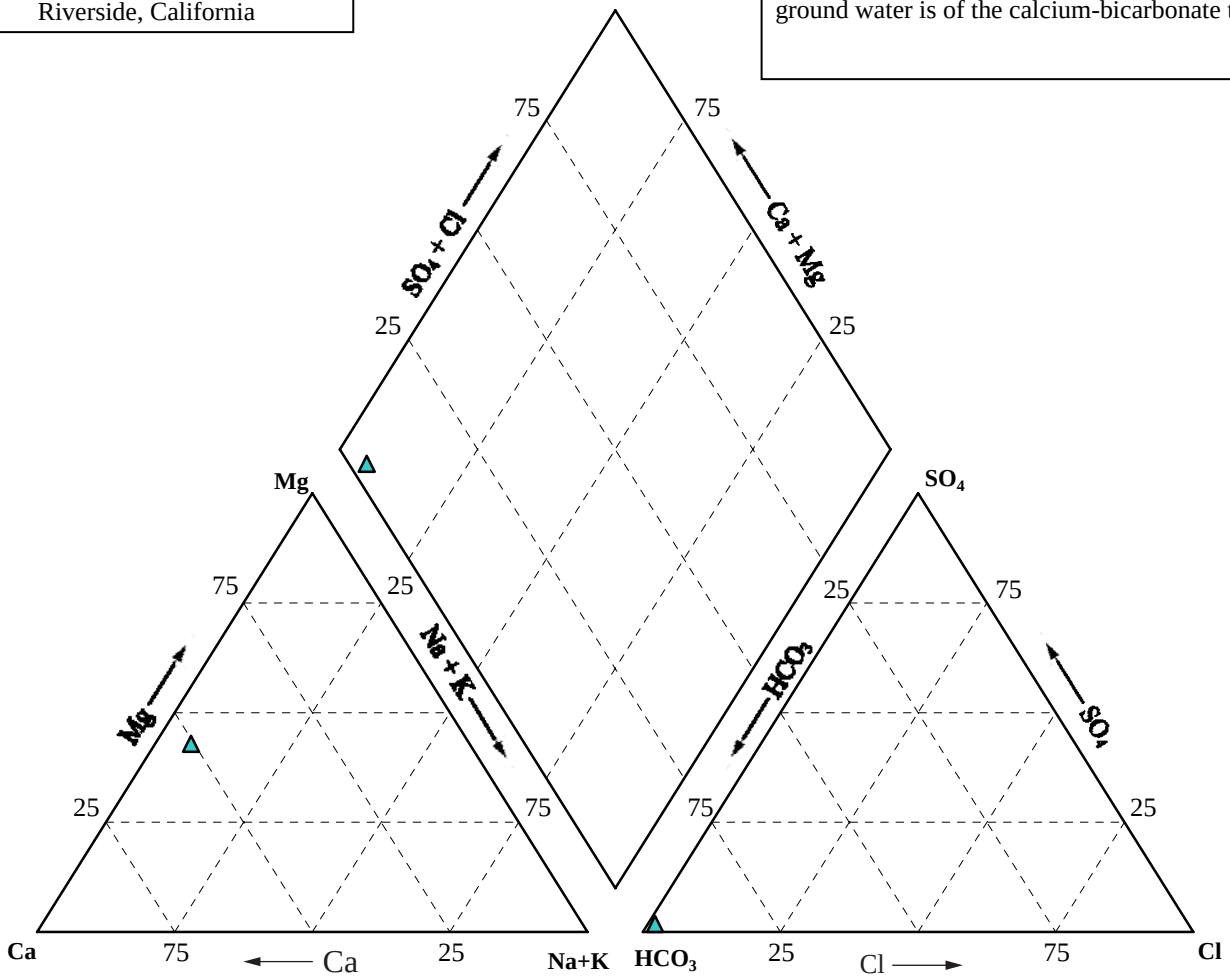

Observation (Fujimoto) Well
Interference Chart
Depth to Water, ft bgs
35
38
41
44
47
50
6/27/08
6/28/08
6/29/08
6/30/08
7/1/08
7/2/08
7/3/08
7/4/08
7/5/08
7/6/08
35 gpm water level
interference trend
Pumping ground water level associated
with the pump in the Fujimoto Well and
other nearby residential wells turning on.
Note: The Fujimoto Well is located
approximately 910 ft east of the Moon
Camp Well FP-2
Start Development Pumping
Stop Development Pumping
Start 35 gpm Pumping
Start 60 gpm Pumping
Start 105 gpm Pumping
Pump Off

Figure 8

Trilinear Diagram
Water Quality Data
Moon Camp Well FP-2

Water Quality Results from E.S. Babcock & Sons, Inc. of Riverside, California

Water Quality samples collected from the Moon Camp Well FP-2 on July 2, 2008 indicate that ground water is of the calcium-bicarbonate type.



TABLE

Summary of Required Water Quality Analyses

Constituent	Units	Detection Limit
General Physical Properties		
Color	Color unit	3
Odor	Odor unit	1
Turbidity	NTU[1]	0.2
MBAS	mg/L[2]	0.05
General Minerals		
Total Hardness	mg/L	3
Calcium	mg/L	1
Magnesium	mg/L	1
Sodium	mg/L	1
Potassium	mg/L	1
Total Alkalinity, as $CaCO_3$	mg/L	3
Hydroxide	mg/L	3
Carbonate	mg/L	3
Bicarbonate	mg/L	3
Sulfate	mg/L	0.5
Chloride	mg/L	1
pH	pH unit	1
Iron	µg/L	20.0
Zinc	µg/L	10.0
Manganese	µg/L	10.0
Copper	µg/L	10.0
Specific Conductance	umhos/cm[3]	1
Total Dissolved Solids (TDS)	mg/L	20
Aggressive Index	-	-
Langlier Index	-	-
Inorganic Chemicals		
Aluminum	µg/L[4]	50.0
Antimony	µg/L	6.0
Arsenic	µg/L	2.0
Barium	µg/L	100.0
Beryllium	µg/L	1.0
Cadmium	µg/L	1.0
Chromium (Total)	µg/L	1.0
Chromium, hexavalent (CrVI)	µg/L	1.0
Cyanide	mg/L	0.1
Fluoride	mg/L	0.1
Lead	µg/L	5.0
Mercury	µg/L	1.0
Nickel	µg/L	10.0
Nitrate, as NO_3	mg/L	1.0
Nitrate, as N	mg/L	0.2
Nitrite, as N	mg/L	0.1
Selenium	µg/L	5.0
Silver	µg/L	10.0
Thallium	µg/L	1.0

California Collaborative Solutions
Results of Rehabilitation and Aquifer Testing
Moon Camp Well FP-2

Table 1

Constituent	Units	Detection Limit
EPA Organic Methods		
Volatiles (EPA 524.2) - includes MTBE	µg/L	various
EDB and DBCP (EPA 504.1)	µg/L	various
Nitrogen & Phosphorus Pesticides (EPA 507)	µg/L	various
Chlorinated Pesticides & PCB's as DCP (EPA 508)	µg/L	various
Chlorinated Acid Herbicides (EPA 515.3)	µg/L	various
DEHP, DEHA, Benzo(EPA a)Pyrene (EPA 525.2)	µg/L	various
Carbamates (EPA 531.1)	µg/L	various
Glyphosate (EPA 547)	µg/L	25.0
Endothall (EPA 548.1)	µg/L	45.0
Diquat (EPA 549.1)	µg/L	4.0
Dioxin (2,3,7,8 TCDD) (EPA 1613)	µg/L	0.000005
Perchlorate (EPA 314.0)	µg/L	4.0
Unregulated Contaminant Monitoring Rule (State and Federal) not Covered Under EPA Organic Methods		
Vanadium	µg/L	3.0
Boron	µg/L	100.0
1,2,3-Trichloropropane (1,2,3-TCP)	µg/L	0.005
Additional Analysis		
Radioactivity (Gross Alpha)	pCi/L[5]	3
Uranium*	µg/L	1
Radium-226*	pCi/L	1
Radium-228**	pCi/L	1
Radon	pCi/L	10
Asbestos	MFL[6]	0.2
Silica (Total)	mg/L	1.0

[1] nephelometric turbidity units

[2] milligrams per liter

[3] micromhos per centimeter

[4] micrograms per liter

[5] picocuries per liter

[6] million fibers per liter

*Analysis for Uranium and Radium-226 should occur only if Gross Alpha is detected above 5 pCi/L

** Analysis for Radium 228 should occur only if Radium 226 is detected above 3 pCi/L

APPENDIX A

Pumping Test Data

GEOSCIENCE Support Services, Inc.
P.O. Box 220, Claremont, CA 91786
Tel: (909) 920-0707 Fax: (909) 920-0403
www.gssiwater.com

PUMPING TEST DATA

Test Date: July 1 - 4, 2008

Well Name/Number: Mooncamp Well FP-2

Circle Well Type: (Pumping) Observation (r = ft)

Circle Test Type: (Step Drawdown) Constant Rate Recovery Development

Static Water Level Depth: 5.85 ft bgs Reference Point Elevation: + 1.64 ft above ground surface

Time of Day	Time Step [min]	Time Total [min]	Depth to Water [ft]	Draw-down [ft]	Pumping Rate [gpm]	Sand Content [ppm]	Totalizer [gal x 10]	Remarks and Other Data
14:05	0	0	7.49	-	-	-	115,464.0	Pump on.
14:07	2	2	11.98	4.49	38	tr	115,471.5	
14:09	4	4	12.09	4.60	18	0	115,475.0	
14:11	6	6	12.68	5.19	20	0	115,479.0	
14:13	8	8	13.80	6.31	33	0	115,485.5	
14:15	10	10	13.91	6.42	33	0	115,492.0	
14:20	15	15	14.16	6.67	30	0	115,507.0	
14:25	20	20	14.33	6.84	31	0	115,522.5	
14:30	25	25	14.43	6.94	30	0	115,537.5	
14:35	30	30	14.51	7.02	31	0	115,553.0	
14:45	40	40	14.76	7.27	30	0	115,582.5	
14:55	50	50	14.81	7.32	29	0	115,611.5	
15:05	60	60	14.81	7.32	30	0	115,641.0	
15:20	75	75	14.89	7.40	29	-	115,684.5	
15:35	90	90	14.96	7.47	27	0	115,725.5	Totalizer briefly not spinning freely
15:45	100	100	-	-	28	0	115,753.0	
15:50	105	105	14.99	7.50	19	0	115,762.5	
16:05	120	120	16.45	8.96	42	0	115,825.0	
16:15	130	130	-	-	36	0	115,861.0	
16:35	150	150	15.51	8.02	33	0	115,926.5	
17:05	180	180	15.55	8.06	36	0	116,033.5	
17:35	210	210	15.64	8.15	35	0	116,139.0	
18:05	240	240	15.61	8.12	35	0	116,244.0	
18:35	270	270	15.65	8.16	36	0	116,352.0	
19:05	300	300	15.65	8.16	36	0	116,460.0	
19:35	330	330	15.70	8.21	36	0	116,568.0	
20:05	360	360	15.72	8.23	35	0	116,672.0	
20:35	390	390	15.74	8.25	36	0	116,779.0	
21:05	420	420	15.75	8.26	36	0	116,886.0	
22:05	480	480	15.78	8.29	36	0	117,100.5	
22:35	510	510	15.80	8.31	37	0	117,210.0	

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Test Date: July 1 - 4, 2008

Well Name/Number: Mooncamp Well FP-2

Circle Well Type: (Pumping) Observation (r = ft)

Circle Test Type: (Step Drawdown) Constant Rate Recovery Development

Static Water Level Depth: 5.85 ft bgs Reference Point Elevation: + 1.64 ft above ground surface

Time of Day	Time Step [min]	Time Total [min]	Depth to Water [ft]	Draw-down [ft]	Pumping Rate [gpm]	Sand Content [ppm]	Totalizer [gal x 10]	Remarks and Other Data
23:05	540	540	15.82	8.33	36	0	117,317.0	
23:35	570	570	15.84	8.35	34	0	117,420.0	
0:05	600	600	15.84	8.35	38	0	117,533.0	
0:35	630	630	15.84	8.35	35	0	117,639.0	
1:05	660	660	15.83	8.34	36	0	117,746.0	
1:35	690	690	15.82	8.33	37	0	117,856.0	
2:05	720	720	15.83	8.34	42	0	117,981.0	
3:05	780	780	15.84	8.35	31	0	118,169.0	
4:05	840	840	15.81	8.32	37	0	118,389.0	
5:05	900	900	15.81	8.32	36	0	118,604.0	
6:05	960	960	15.84	8.35	36	0	118,822.0	
7:05	1020	1020	15.84	8.35	36	0	119,037.0	
8:05	1080	1080	15.87	8.38	39	0	119,272.0	
9:05	1140	1140	15.90	8.41	35	0	119,480.0	
10:05	1200	1200	16.22	8.73	34	0	119,682.0	
11:05	1260	1260	16.30	8.81	36	0	119,896.0	
12:05	1320	1320	16.08	8.59	36	0	120,114.0	
13:05	1380	1380	16.06	8.57	34	0	120,319.0	Q_1 = 35 gpm, SC_1 = 4.1 gpm/ft
14:05	1440	1440	16.04	8.55	35	0	120,526.0	Adjust Q up.
14:07	2	1442	18.66	11.17	55	0	120,537.0	
14:09	4	1444	18.60	11.11	65	0	120,550.0	
14:11	6	1446	18.67	11.18	60	0	120,562.0	
14:13	8	1448	18.73	11.24	60	0	120,574.0	
14:15	10	1450	18.79	11.30	60	0	120,586.0	
14:20	15	1455	18.91	11.42	62	0	120,617.0	
14:25	20	1460	18.93	11.44	60	0	120,647.0	
14:30	25	1465	19.01	11.52	62	0	120,678.0	
14:35	30	1470	19.03	11.54	60	0	120,708.0	
14:45	40	1480	19.09	11.60	61	0	120,769.0	
14:50	45	1485	19.09	11.60	60	0	120,799.0	
14:55	50	1490	19.10	11.61	62	0	120,830.0	

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PUMPING TEST DATA

Test Date: July 1 - 4, 2008

Well Name/Number: Mooncamp Well FP-2

Circle Well Type: (Pumping) Observation (r = ft)

Circle Test Type: (Step Drawdown) Constant Rate Recovery Development

Static Water Level Depth: 5.85 ft bgs Reference Point Elevation: + 1.64 ft above ground surface

Time of Day	Time Step [min]	Time Total [min]	Depth to Water [ft]	Draw-down [ft]	Pumping Rate [gpm]	Sand Content [ppm]	Totalizer [gal x 10]	Remarks and Other Data
15:05	60	1500	19.21	11.72	61	0	120,890.5	
15:20	75	1515	19.21	11.72	60	0	120,980.0	
15:35	90	1530	19.24	11.75	60	0	121,070.5	
15:50	105	1545	19.26	11.77	61	0	121,162.5	
16:05	120	1560	19.30	11.81	59	0	121,251.5	
16:35	150	1590	19.36	11.87	60	0	121,432.0	
17:05	180	1620	19.38	11.89	61	0	121,614.0	
17:35	210	1650	19.43	11.94	61	0	121,798.0	
18:05	240	1680	19.46	11.97	60	0	121,978.0	
18:35	270	1710	19.48	11.99	61	0	122,160.0	
19:05	300	1740	19.48	11.99	61	0	122,343.0	
19:35	330	1770	19.54	12.05	61	0	122,526.0	
20:05	360	1800	19.62	12.13	61	0	122,709.0	
20:35	390	1830	19.59	12.10	61	0	122,892.0	
21:05	420	1860	19.61	12.12	61	0	123,074.0	
21:35	450	1890	19.63	12.14	61	0	123,256.0	
22:05	480	1920	19.66	12.17	61	0	123,438.0	
22:35	510	1950	19.68	12.19	60	0	123,619.0	
23:05	540	1980	19.72	12.23	61	0	123,801.0	
23:35	570	2010	19.72	12.23	60	0	123,982.0	
0:05	600	2040	19.75	12.26	60	0	124,163.0	
0:35	630	2070	19.70	12.21	53	0	124,322.0	
1:05	660	2100	19.73	12.24	61	0	124,506.0	
1:35	690	2130	19.71	12.22	61	0	124,689.0	
2:05	720	2160	19.76	12.27	57	0	124,860.0	
3:05	780	2220	19.84	12.35	64	0	125,245.0	
4:05	840	2280	19.84	12.35	59	0	125,598.0	
5:05	900	2340	19.82	12.33	59	0	125,950.0	
6:05	960	2400	19.90	12.41	61	0	126,318.0	
7:05	1020	2460	19.86	12.37	59	0	126,671.0	
8:05	1080	2520	19.89	12.40	61	0	127,035.0	

GEOSCIENCE Support Services, Inc.
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PUMPING TEST DATA

Test Date: July 1 - 4, 2008

Well Name/Number: Mooncamp Well FP-2

Circle Well Type: (Pumping) Observation (r = ft)

Circle Test Type: (Step Drawdown) Constant Rate Recovery Development

Static Water Level Depth: 5.85 ft bgs Reference Point Elevation: + 1.64 ft above ground surface

Time of Day	Time Step [min]	Time Total [min]	Depth to Water [ft]	Draw-down [ft]	Pumping Rate [gpm]	Sand Content [ppm]	Totalizer [gal x 10]	Remarks and Other Data
9:05	1140	2580	19.94	12.45	61	0	127,399.0	
10:05	1200	2640	19.94	12.45	62	0	127,771.0	
11:05	1260	2700	19.98	12.49	61	0	128,135.0	
12:05	1320	2760	20.05	12.56	62	0	128,504.5	
13:05	1380	2820	20.12	12.63	60	0	128,865.0	Q_2 = 60 gpm, SC_2 = 4.5 gpm/ft
14:05	1440	2880	20.90	13.41	60	0	129,226.0	Adjust Q up.
14:07	2	2882	26.21	18.72	100	0	129,246.0	
14:08	3	2883	26.50	19.01	105	0	129,256.5	
14:09	4	2884	26.66	19.17	110	0	129,267.5	
14:11	6	2886	26.82	19.33	108	0	129,289.0	
14:13	8	2888	27.02	19.53	105	0	129,310.0	
14:15	10	2890	27.14	19.65	108	0	129,331.5	
14:20	15	2895	27.34	19.85	105	0	129,384.0	
14:25	20	2900	27.30	19.81	104	0	129,436.0	
14:30	25	2905	27.42	19.93	106	0	129,489.0	
14:35	30	2910	27.51	20.02	105	0	129,541.5	
14:45	40	2920	27.65	20.16	104	0	129,645.5	
14:55	50	2930	27.73	20.24	105	0	129,750.5	
15:05	60	2940	27.84	20.35	105	0	129,855.0	
15:20	75	2955	27.97	20.48	100	0	130,005.0	
15:35	90	2970	28.05	20.56	110	0	130,170.0	
15:50	105	2985	28.13	20.64	104	0	130,326.5	
16:05	120	3000	28.17	20.68	106	0	130,485.0	
16:35	150	3030	28.28	20.79	105	0	130,799.0	
17:05	180	3060	28.35	20.86	105	0	131,112.5	
17:35	210	3090	28.44	20.95	105	0	131,426.0	
18:05	240	3120	28.52	21.03	101	0	131,730.0	
18:35	270	3150	28.60	21.11	108	0	132,054.0	
19:05	300	3180	28.64	21.15	104	0	132,367.0	
19:35	330	3210	28.70	21.21	104	0	132,680.0	
20:05	360	3240	28.75	21.26	105	0	132,994.0	

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PUMPING TEST DATA

Test Date: July 1 - 4, 2008

Well Name/Number: Mooncamp Well FP-2

Circle Well Type: (Pumping) Observation (r = ft)

Circle Test Type: (Step Drawdown) Constant Rate Recovery Development

Static Water Level Depth: 5.85 ft bgs Reference Point Elevation: + 1.64 ft above ground surface

Time of Day	Time Step [min]	Time Total [min]	Depth to Water [ft]	Draw-down [ft]	Pumping Rate [gpm]	Sand Content [ppm]	Totalizer [gal x 10]	Remarks and Other Data
20:35	390	3270	28.83	21.34	104	0	133,307.0	
21:05	420	3300	28.87	21.38	104	0	133,620.0	
21:35	450	3330	28.92	21.43	105	0	133,934.0	
22:05	480	3360	28.96	21.47	104	0	134,247.0	
22:35	510	3390	29.01	21.52	104	0	134,560.0	
23:05	540	3420	29.04	21.55	105	0	134,873.5	
23:35	570	3450	29.09	21.60	105	0	135,187.0	
0:05	600	3480	29.14	21.65	104	0	135,500.0	
0:35	630	3510	29.17	21.68	105	0	135,814.0	
1:05	660	3540	29.15	21.66	109	0	136,140.0	
1:35	690	3570	29.21	21.72	105	0	136,455.0	
2:05	720	3600	29.20	21.71	103	0	136,764.0	
3:05	780	3660	29.28	21.79	107	0	137,405.0	
4:05	840	3720	29.30	21.81	105	0	138,037.0	
5:05	900	3780	29.35	21.86	107	0	138,678.0	
6:05	960	3840	29.39	21.90	106	0	139,312.0	
7:05	1020	3900	29.45	21.96	104	0	139,938.0	
8:05	1080	3960	29.51	22.02	105	0	140,567.0	
9:05	1140	4020	29.55	22.06	108	0	141,215.0	
10:05	1200	4080	29.62	22.13	104	0	141,838.0	
11:05	1260	4140	29.68	22.19	107	0	142,480.0	
12:05	1320	4200	29.72	22.23	109	0	143,132.0	
13:05	1380	4260	29.83	22.34	105	0	143,762.5	Q_3 = 105 gpm, SC_3 = 4.7 gpm/ft
14:05	1440	4320	29.85	22.36	106	0	144,399.5	Pump off.

GEOSCIENCE

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PUMPING TEST DATA

Test Date: July 4, 2008

Well Name/Number: Mooncamp Well FP-2

Circle Well Type: (Pumping) Observation (r = ft)

Circle Test Type: Step Drawdown Constant Rate (Recovery) Development

Static Water Level Depth: 5.85 ft bgs Reference Point Elevation: + 1.64 ft above ground surface

Time of Day	Time Step [min]	Time Total [min]	Depth to Water [ft]	Draw-down [ft]	Pumping Rate [gpm]	Sand Content [ppm]	Totalizer [kgal]	Remarks and Other Data
2:05 PM	0	4,320	29.85	22.36	-	-	144,399.5	Pump off.
2:07 PM	2	4,322	15.65	8.16	-	-	-	
2:09 PM	4	4,324	14.67	7.18	-	-	-	
2:11 PM	6	4,326	14.13	6.64	-	-	-	
2:13 PM	8	4,328	13.75	6.26	-	-	-	
2:15 PM	10	4,330	13.45	5.96	-	-	-	
2:20 PM	15	4,335	12.95	5.46	-	-	-	
2:25 PM	20	4,340	12.50	5.01	-	-	-	
2:30 PM	25	4,345	12.30	4.81	-	-	-	
2:35 PM	30	4,350	12.08	4.59	-	-	-	
2:45 PM	40	4,360	11.65	4.16	-	-	-	
2:55 PM	50	4,370	11.41	3.92	-	-	-	
3:05 PM	60	4,380	11.24	3.75	-	-	-	
3:26 PM	81	4,401	10.85	3.36	-	-	-	
3:36 PM	91	4,411	10.73	3.24	-	-	-	
3:50 PM	105	4,425	10.54	3.05	-	-	-	
4:05 PM	120	4,440	10.40	2.91	-	-	-	
4:35 PM	150	4,470	10.10	2.61	-	-	-	
5:05 PM	180	4,500	9.90	2.41	-	-	-	
5:35 PM	210	4,530	9.68	2.19	-	-	-	
6:05 PM	240	4,560	9.55	2.06	-	-	-	

APPENDIX B

Water Quality Data

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name: Geoscience Support Services Inc.
Contact: Diane Smith
Address: P.O. Box 220
Claremont, CA 91711

Report Date: 16-Jul-2008

Analytical Report: Page 1 of 9
Project Name: Geo - Well Testing
Project Number: [none]

Work Order Number: A8G0246

Received on Ice (Y/N): Yes Temp: 6 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
A8G0246-01	Moon Camp Well FP2, Fawnskin CA	Water	07/02/08 10:00	Christofer Coppinger	07/02/08 14:50	Nathan Reynolds

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Riverside, CA 92502-0432

location
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NELAP no. 02101CA
CA ELAP no. 1156
EPA no. CA00102

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name: Geoscience Support Services Inc.
Contact: Diane Smith
Address: P.O. Box 220
Claremont, CA 91711

Report Date: 16-Jul-2008

Analytical Report: Page 2 of 9
Project Name: Geo - Well Testing
Project Number: [none]

Work Order Number: A8G0246

Received on Ice (Y/N): Yes Temp: 6 °C

Laboratory Reference Number
A8G0246-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Moon Camp Well FP2, Fawnskin CA	Water	07/02/08 10:00	07/02/08 14:50

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	270	3.0	mg/L	SM 3120B	07/08/08 15:17	lmt	
Calcium	58	1.0	mg/L	EPA 200.7	07/08/08 15:17	lmt	
Magnesium	30	1.0	mg/L	EPA 200.7	07/08/08 15:17	lmt	
Sodium	7.6	1.0	mg/L	EPA 200.7	07/08/08 15:17	lmt	
Potassium	1.6	1.0	mg/L	EPA 200.7	07/08/08 15:17	lmt	
Total Cations	5.8	0.05	me/L	Calculation			
Anions							
Total Alkalinity	280	3.0	mg/L	SM 2320B	07/11/08 13:38	ctl	
Hydroxide	ND	3.0	mg/L	SM 2320B	07/11/08 13:38	ctl	
Carbonate	ND	3.0	mg/L	SM 2320B	07/11/08 13:38	ctl	
Bicarbonate	340	3.0	mg/L	SM 2320B	07/11/08 13:38	ctl	
Chloride	2.7	1.0	mg/L	EPA 300.0	07/02/08 23:44	JC	
Sulfate	5.2	0.50	mg/L	EPA 300.0	07/02/08 23:44	JC	
Nitrate as N	0.20	0.20	mg/L	EPA 300.0	07/02/08 23:44	JC	
Fluoride	ND	0.1	mg/L	SM 4500F C	07/11/08 14:20	hga	
Nitrate	ND	1.0	mg/L	EPA 300.0	07/02/08 23:44	JC	
Total Anions	5.80	0.05	me/L	Calculation			
Aggregate Properties							
pH	7.5	1.0	pH Units	SM 4500H+ B	07/02/08 20:08	sbd	
Specific Conductance	510	1.0	umhos/cm	SM 2510 B	07/02/08 20:08	sbd	
Aggressive Index	12.2	1.0	N/A	Calculation			
Langlier Index @ Site Temp.	0.30		N/A	SM 2330 B	07/03/08 12:37	saf	

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NELAP no. 02101CA
CA ELAP no. 1156
EPA no. CA00102

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name: Geoscience Support Services Inc.
Contact: Diane Smith
Address: P.O. Box 220
Claremont, CA 91711

Report Date: 16-Jul-2008

Analytical Report: Page 3 of 9
Project Name: Geo - Well Testing
Project Number: [none]

Work Order Number: A8G0246

Received on Ice (Y/N): Yes Temp: 6 °C

Laboratory Reference Number
A8G0246-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Moon Camp Well FP2, Fawnskin CA	Water	07/02/08 10:00	07/02/08 14:50

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Solids							
Total Dissolved Solids	300	20	mg/L	SM 2540C	07/08/08 14:45	hga	
General Physical							
Color	ND	3.0	Color Units	SM 2120B	07/03/08 19:17	sbd	
Odor	ND	1.0	T.O.N.*	SM 2150	07/03/08 19:17	sbd	
Turbidity	0.39	0.20	NTU	SM 2130 B	07/03/08 19:17	sbd	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/03/08 11:28	ctl	
General Inorganics							
Cyanide	ND	100	ug/L	SM 4500CN E	07/09/08 14:19	mds	N_pScr
Perchlorate	ND	4.0	ug/L	EPA 314.0	07/11/08 19:32	cth	
Nutrients							
Nitrite as N	ND	100	ug/L	SM 4500NO2 B	07/03/08 17:00	adb	
Metals and Metalloids							
Aluminum	ND	50	ug/L	EPA 200.7	07/08/08 15:17	lmt	
Antimony	ND	6.0	ug/L	EPA 200.8	07/09/08 17:17	ap	
Arsenic	ND	2.0	ug/L	EPA 200.8	07/09/08 17:17	ap	
Barium	ND	100	ug/L	EPA 200.8	07/09/08 17:17	ap	
Beryllium	ND	1.0	ug/L	EPA 200.8	07/09/08 17:17	ap	
Boron	ND	100	ug/L	EPA 200.7	07/08/08 15:17	lmt	
Cadmium	ND	1.0	ug/L	EPA 200.8	07/09/08 17:17	ap	
Total Chromium	1.1	1.0	ug/L	EPA 200.8	07/08/08 10:15	krv	
Hexavalent Chromium	ND	1.0	ug/L	EPA 218.6	07/08/08 18:42	jc	N_pFilt
Copper	ND	50	ug/L	EPA 200.8	07/09/08 17:17	ap	
Iron	ND	100	ug/L	EPA 200.7	07/08/08 15:17	lmt	
Lead	ND	5.0	ug/L	EPA 200.8	07/09/08 17:17	ap	
Manganese	ND	20	ug/L	EPA 200.8	07/09/08 17:17	ap	

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NELAP no. 02101CA
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EPA no. CA00102

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Environmental Laboratories est 1906

Client Name: Geoscience Support Services Inc.
Contact: Diane Smith
Address: P.O. Box 220
Claremont, CA 91711

Report Date: 16-Jul-2008

Analytical Report: Page 4 of 9
Project Name: Geo - Well Testing
Project Number: [none]

Work Order Number: A8G0246

Received on Ice (Y/N): Yes Temp: 6 °C

Laboratory Reference Number
A8G0246-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Moon Camp Well FP2, Fawnskin CA	Water	07/02/08 10:00	07/02/08 14:50

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Mercury	ND	1.0	ug/L	EPA 200.8	07/09/08 17:17	ap	
Nickel	ND	10	ug/L	EPA 200.8	07/09/08 17:17	ap	
Selenium	ND	5.0	ug/L	EPA 200.8	07/09/08 17:17	ap	
Total Silica	25	5.0	mg/L	EPA 200.7	07/08/08 15:17	lmt	
Silver	ND	10	ug/L	EPA 200.8	07/09/08 17:17	ap	
Thallium	ND	1.0	ug/L	EPA 200.8	07/09/08 17:17	ap	
Vanadium	ND	3.0	ug/L	EPA 200.8	07/08/08 10:15	krv	
Zinc	ND	50	ug/L	EPA 200.8	07/09/08 17:17	ap	
EDB and DBCP by EPA 504							
Ethylene dibromide	ND	0.020	ug/L	EPA 504.1	07/03/08 18:23	cya	
Dibromochloropropane	ND	0.010	ug/L	EPA 504.1	07/03/08 18:23	cya	
Nitrogen-Phosphorus Pesticides by EPA 507							
Alachlor	ND	1.0	ug/L	EPA 507	07/07/08 20:52	kos	
Atrazine	ND	0.50	ug/L	EPA 507	07/07/08 20:52	kos	
Butachlor	ND	0.38	ug/L	EPA 507	07/07/08 20:52	kos	
Diazinon	ND	0.25	ug/L	EPA 507	07/07/08 20:52	kos	
Metolachlor	ND	1.0	ug/L	EPA 507	07/07/08 20:52	kos	
Metribuzin	ND	1.0	ug/L	EPA 507	07/07/08 20:52	kos	
Molinate	ND	0.90	ug/L	EPA 507	07/07/08 20:52	kos	
Prometryn	ND	2.0	ug/L	EPA 507	07/07/08 20:52	kos	
Simazine	ND	1.0	ug/L	EPA 507	07/07/08 20:52	kos	
Thiobencarb	ND	1.0	ug/L	EPA 507	07/07/08 20:52	kos	
Surrogate: 1,3-Dimethyl-2-Nitrobenzene	96.5	% 70-130		EPA 507	07/07/08 20:52	kos	

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Environmental Laboratories est 1906

Client Name: Geoscience Support Services Inc.
Contact: Diane Smith
Address: P.O. Box 220
Claremont, CA 91711

Report Date: 16-Jul-2008

Analytical Report: Page 5 of 9
Project Name: Geo - Well Testing
Project Number: [none]

Work Order Number: A8G0246

Received on Ice (Y/N): Yes Temp: 6 °C

Laboratory Reference Number
A8G0246-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Moon Camp Well FP2, Fawnskin CA	Water	07/02/08 10:00	07/02/08 14:50

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Organochlorine Pesticides and PCBs by EPA 508							
Aldrin	ND	0.075	ug/L	EPA 508	07/07/08 17:46	DF	
Chlordane	ND	0.10	ug/L	EPA 508	07/07/08 17:46	DF	
Dieldrin	ND	0.020	ug/L	EPA 508	07/07/08 17:46	DF	
Endrin	ND	0.10	ug/L	EPA 508	07/07/08 17:46	DF	
Heptachlor	ND	0.010	ug/L	EPA 508	07/07/08 17:46	DF	
Heptachlor Epoxide	ND	0.010	ug/L	EPA 508	07/07/08 17:46	DF	
Hexachlorobenzene	ND	0.50	ug/L	EPA 508	07/07/08 17:46	DF	
Hexachlorocyclopentadiene	ND	1.0	ug/L	EPA 508	07/07/08 17:46	DF	
Lindane	ND	0.20	ug/L	EPA 508	07/07/08 17:46	DF	
Methoxychlor	ND	10	ug/L	EPA 508	07/07/08 17:46	DF	
Polychlorinated Biphenyls (Total PCB's)	ND	0.50	ug/L	EPA 508	07/07/08 17:46	DF	
Propachlor	ND	0.50	ug/L	EPA 508	07/07/08 17:46	DF	
Toxaphene	ND	1.0	ug/L	EPA 508	07/07/08 17:46	DF	
Surrogate: Decachlorobiphenyl	95.5	% 70-130		EPA 508	07/07/08 17:46	DF	
Chlorinated Herbicides by EPA 515.3							
2,4,5-TP Silvex	ND	1.0	ug/L	EPA 515.3	07/09/08 07:05	DF	
2,4-D	ND	10	ug/L	EPA 515.3	07/09/08 07:05	DF	
Bentazon	ND	2.0	ug/L	EPA 515.3	07/09/08 07:05	DF	
Dalapon	ND	10	ug/L	EPA 515.3	07/09/08 07:05	DF	
Dicamba	ND	1.5	ug/L	EPA 515.3	07/09/08 07:05	DF	
Dinoseb	ND	2.0	ug/L	EPA 515.3	07/09/08 07:05	DF	
Pentachlorophenol	ND	0.20	ug/L	EPA 515.3	07/09/08 07:05	DF	
Pichloram	ND	1.0	ug/L	EPA 515.3	07/09/08 07:05	DF	
Surrogate: DCAA	96.3	% 70-130		EPA 515.3	07/09/08 07:05	DF	

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Client Name: Geoscience Support Services Inc.
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Report Date: 16-Jul-2008

Analytical Report: Page 6 of 9
Project Name: Geo - Well Testing
Project Number: [none]

Work Order Number: A8G0246
Received on Ice (Y/N): Yes Temp: 6 °C

Laboratory Reference Number
A8G0246-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Moon Camp Well FP2, Fawnskin CA	Water	07/02/08 10:00	07/02/08 14:50

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Volatile Organic Compounds by EPA 524.2							Nconf, NTBnr
1,1,1,2-Tetrachloroethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,1,1-Trichloroethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,1,2,2-Tetrachloroethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,1,2-Trichloroethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,1-Dichloroethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,1-Dichloroethene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,1-Dichloropropene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,2,3-Trichlorobenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,2,4-Trichlorobenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,2,4-Trimethylbenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,2-Dichlorobenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,2-Dichloroethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,2-Dichloropropane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,3,5-Trimethylbenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,3-Dichlorobenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,3-Dichloropropane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
1,4-Dichlorobenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
2,2-Dichloropropane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	NCALI
2-Butanone(MEK-EPA 8260)	ND	5.0	ug/L	EPA 524.2	07/07/08 16:22	EEC	
2-Chlorotoluene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
4-Chlorotoluene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
4-Methyl-2-Pentanone(MIBK)	ND	5.0	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Benzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Bis(2-chloroethyl)ether (Non-NELAP)	ND	5.0	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Bromobenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Bromochloromethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Bromodichloromethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Bromoform	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Bromomethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	

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Client Name: Geoscience Support Services Inc.
Contact: Diane Smith
Address: P.O. Box 220
Claremont, CA 91711

Report Date: 16-Jul-2008

Analytical Report: Page 7 of 9
Project Name: Geo - Well Testing
Project Number: [none]

Work Order Number: A8G0246
Received on Ice (Y/N): Yes Temp: 6 °C

Laboratory Reference Number
A8G0246-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Moon Camp Well FP2, Fawnskin CA	Water	07/02/08 10:00	07/02/08 14:50

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Volatile Organic Compounds by EPA 524.2							Nconf, NTBnr
Carbon Tetrachloride	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Chlorobenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Chloroethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Chloroform	0.98	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Chloromethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
s-1,2-Dichloroethene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
cis-1,3-Dichloropropene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Dibromochloromethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Dibromomethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Dichlorodifluoromethane	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Di-isopropyl ether	ND	3.0	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Ethyl tert-Butyl Ether	ND	3.0	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Ethylbenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Hexachlorobutadiene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Isopropylbenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Methyl tert butyl Ether	ND	3.0	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Methylene Chloride	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
n-Butylbenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
n-Propylbenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Naphthalene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
p-Isopropyltoluene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
sec-Butylbenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Styrene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
tert-Amyl Methyl Ether	ND	3.0	ug/L	EPA 524.2	07/07/08 16:22	EEC	
tert-Butyl alcohol	ND	2.0	ug/L	EPA 524.2	07/07/08 16:22	EEC	
tert-Butylbenzene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Tetrachloroethene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Toluene	1.2	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
trans-1,2-Dichloroethene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
trans-1,3-Dichloropropene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	

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Client Name: Geoscience Support Services Inc.
Contact: Diane Smith
Address: P.O. Box 220
Claremont, CA 91711

Report Date: 16-Jul-2008

Analytical Report: Page 8 of 9
Project Name: Geo - Well Testing
Project Number: [none]

Work Order Number: A8G0246

Received on Ice (Y/N): Yes Temp: 6 °C

Laboratory Reference Number
A8G0246-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
Moon Camp Well FP2, Fawnskin CA	Water	07/02/08 10:00	07/02/08 14:50

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Volatile Organic Compounds by EPA 524.2							Nconf, NTBnr
Trichloroethene	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Trichlorofluoromethane	ND	5.0	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Trichlorotrifluoroethane	ND	10	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Vinyl Chloride	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Xylenes (m+p)	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Xylenes (ortho)	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Xylenes (Total)	ND	0.50	ug/L	EPA 524.2	07/07/08 16:22	EEC	
Surrogate: 1,2-Dichloroethane-d4	135	% 50-150		EPA 524.2	07/07/08 16:22	EEC	
Surrogate: Bromofluorobenzene	113	% 50-150		EPA 524.2	07/07/08 16:22	EEC	
Surrogate: Toluene-d8	100	% 50-150		EPA 524.2	07/07/08 16:22	EEC	
1,2,3-TCP by Purge & Trap GC/MS							
1,2,3-Trichloropropane	ND	0.005	ug/L	CA DHS-SRL	07/07/08 13:26	JES	
Semivolatile Organic Compounds by EPA 525.2							
Benzo(a)pyrene	ND	0.10	ug/L	EPA 525.2	07/07/08 19:55	DF	
DEH-Adipate	ND	5.0	ug/L	EPA 525.2	07/07/08 19:55	DF	
DEH-Phthalate	ND	3.0	ug/L	EPA 525.2	07/07/08 19:55	DF	
Surrogate: 4-Terphenyl-d14	108	% 70-130		EPA 525.2	07/07/08 19:55	DF	
Endothall by EPA 548.1							
Endothall	ND	45	ug/L	EPA 548.1	07/10/08 12:29	kos	

* NELAP does not offer accreditation for this analyte/method/matrix combination

mailing
P.O. Box 432
Riverside, CA 92502-0432

location
6100 Quail Valley Court
Riverside, CA 92507-0704

P 951 653 3351
F 951 653 1662
www.babcocklabs.com

NELAP no. 02101CA
CA ELAP no. 1156
EPA no. CA00102

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name: Geoscience Support Services Inc.
Contact: Diane Smith
Address: P.O. Box 220
Claremont, CA 91711

Report Date: 16-Jul-2008

Analytical Report: Page 9 of 9
Project Name: Geo - Well Testing
Project Number: [none]

Work Order Number: A8G0246
Received on Ice (Y/N): Yes Temp: 6 °C

Notes and Definitions

pH:	Regulatory 15 minute holding time exceeded (A8G0246-01)
N_pFilt	Sample filtered and preserved upon receipt to the laboratory.
N_pScr	Sample screened for interference and preserved upon receipt to the laboratory.
NCALI	The sample result(s) are estimate(s). The instrument calibration verification result(s) were below laboratory acceptance criteria.
Nconf	Result(s) confirmed by re-analysis.
NTBnr	No travel blank was received with this sample.
ND:	Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit

* / (Non-NELAP): NELAP does not offer accreditation for this analyte/method/matrix combination

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted. Babcock Laboratories and its officers and employees assume no responsibility and make no warranty, express or implied, for uses or interpretations made by any recipients, intended or unintended, of this report.

Lorenzo Rodriguez

☒ Lorenzo Rodriguez, Project Manager ☐ Allison Mackenzie, General Manager ☐ Lawrence J. Chrystal, Laboratory Director

cc: ESB_Short_.Report

mailing P.O. Box 432 Riverside, CA 92502-0432 | *location* 6100 Quail Valley Court Riverside, CA 92507-0704 | P 951 653 3351 F 951 653 1662 www.babcocklabs.com | NELAP no. 02101CA CA ELAP no. 1156 EPA no. CA00102

DATE: July 11, 2008

CLIENT: EDWARD S. BABCOCK & SONS, INC.
P.O. BOX 432
RIVERSIDE, CA 92502-0432

ATTENTION: Humaira Saleem

REFERENCE: A8G0240

REPORT NO: 122252

SUBJECT: ANALYSIS OF WATER SAMPLE FOR ASBESTOS BY TEM

ACCREDITED: California Department of Health Services (ELAP-1119)

The date and times of collection, receipt, filtration, and analysis are as follows:

SAMPLE NO: A8G0240-01

COLLECTED: 7/2/08 at 1000 by Christofer Coppinger (Geoscience Services, Inc.)

RECEIVED: 7/3/08 at 1125

FILTERED: 7/3/08 at 1150

ANALYZED: 7/9/08

The sample was analyzed for fibers >10 μm in length to conform with the drinking water document, EPA 600 94 134, 100.2. This regulation calls for an MCL (maximum contaminant level) of 7 MFL and an analytical sensitivity level of 0.2 MFL.

No asbestos structures >10μm in length were detected. The analytical sensitivity of 0.2 MFL was reached.

The results of the analysis and the detection limit are summarized on the following pages.

Respectfully submitted,
EMS LABORATORIES, INC.

B. M. Kolk
Laboratory Director

BMK/ah

NOTE: The results of the analysis are based upon the samples submitted to the laboratory. No representation is made regarding the sampling area other than that implied by the analytical results for the immediate vicinity of the samples analyzed as calculated from the data presented with those samples.

This report, from a NIST laboratory through NVLAP, must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

This report shall not be reproduced, except in full, without the written approval of EMS Laboratories, Inc.

Any deviation or exclusion from the test method is noted in this cover letter.

Unless otherwise noted in this cover letter, the samples were received properly packaged, clearly identified and intact.

SUBCONTRACT ORDER

E.S. Babcock & Sons, Inc.

A8G0240

SENDING LABORATORY:	**RECEIVING LABORATORY:**
E.S. Babcock & Sons, Inc. P. O. Box 432 Riverside, CA 92502-0432 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Humaira Saleem	EMS Laboratories 117 W. Bellevue Drive Pasadena, CA 91105 Phone :(626) 568-4065 Fax: (626) 796-5282

Client: Geoscience Support Services Inc.
Sampler: Christofer Coppinger

No State Form

Analysis	Due	Expires Regulatory Days Past Date Sampled	Laboratory ID	Comments
Sample ID: A8G0240-01	**Water**	**Sampled:07/02/08 10:00**	**Mooncamp FP2, Fawnskin, CA**	
Asbestos *Containers Supplied:* Quart Poly - Unpres (E)	07/14/08 17:00	12/29/08 10:00		

All Containers Intact: X Yes ____No Samples Preserved Properly: ____Yes ____No

Samples Received at _____ oC Sample Lables / COC Agree: X Yes ____No Custody Seals Present: ____Yes X No

An acknowledgement of sample receipt is requested. Please reply to slozen@babcocklabs.com or Fax to 951-653-3351. Thank You.

Released By	Date	Received By	Date
[signature]	7/2/08	[signature]	7-3-08 11:25
Released By	Date	Received By	Date

Page 1 of 1

ANALYSIS OF WATER BY TEM (EPA-600 R 94 134) EPA 100.2

LAB NO: 122252
CLIENT: E.S. Babcock & Sons, Inc.
7/9/2008

Laboratory I.D.	Client I.D.	FILTER MEDIA DATA			No. of G.O.	Analyzed Area, mm^2	Sample Volume (ml)
		Type	Diameter mm	Effective Area mm^2			
122252-1	A8G0240-01*	PC	47	1017	6	0.0558	100

* FOR FIBERS > 10um ONLY

INDIVIDUAL ANALYTICAL RESULTS

Laboratory I.D.	Client I.D.	No. of Asbestos			Detection Limit (MFL)	CONCENTRATION (MFL)		
		Str	Str >5um	Str >10um		Str	Str >5um	Str >10um
122252-1	A8G0240-01*	-	-	N.D.	0.2	-	-	N.D.

* FOR FIBERS > 10um ONLY

The analysis was carried out to the approved TEM method. This laboratory is in compliance with the quality specified by the method.

Authorized Signature

Analysis of Water by Transmission Electron Microscopy
(EPA-600 R 94 134) EPA 100.2

EMS No.	122252	**Client**	E.S. Babcock & Sons, Inc
Sample No.	A8G0240-01	**Date Analyzed**	7/9/2008

Fibers > 10 µm in length (chrysotile)	BDL*	MFL
Mass (chrysotile)	0	ug/L
More/Less than 5 Fibers in Sample (chrysotile)	LESS	
Poisson 95% Confidence Interval	0 to 0.7	MFL
Detection Limit	0.2	MFL

* BDL : Below Detection Limit; MFL: Million Fibers per Liter

Particle Size Distribution (Chrysotile)

Particle Length - Microns

O -0.49	0.50 - 0.99	1.00 - 1.49	1.50 - 1.99	2.00 - 2.49	2.5 - 4.99	5.00 - 9.99	10 & UP
0	0	0	0	0	0	0	0

Particle Width - Microns

O - .04	.05 - .09	.1 - .14	.15 - .19	.2 - .24	.25 - .49	.50 - .99	1 & UP
0	0	0	0	0	0	0	0

Aspect Ratio L/W

0 - 9.9	10 - 19.9	20 - 29.9	30 - 39.9	40 - 49.9	50 - 99	100 - 199	200 & UP
0	0	0	0	0	0	0	0

TEM 7B (1994)

Analysis of Water by Transmission Electron Microscopy
(EPA-600/4-83-043)

EMS No.	122252	**Date Analyzed**	7/9/2008
Client	E.S. Babcock & Sons, Inc		
Sample No.	EMS BLANK		

Fibers (chrysotile)	ND	MFL
> 5 Micron length (chrysotile)	ND	MFL
Mass (chrysotile)	0	ug/L
More/Less than 5 Fibers in Sample (chrysotile)	LESS	
Sensitivity Level	0	MFL

Particle Size Distribution (Chrysotile)

Particle Length - Microns

O -0.49	0.50 - 0.99	1.00 - 1.49	1.50 - 1.99	2.00 - 2.49	2.5 & UP
0	0	0	0	0	0

Particle Width - Microns

O - .04	.05 - .09	.1 - .14	.15 - .19	.2 - .24	.25 & UP
0	0	0	0	0	0

Aspect Ratio L/W

0 - 9.9	10 - 19.9	20 - 29.9	30 - 39.9	40 - 49.9	50 & UP
0	0	0	0	0	0

EMS LABORATORIES 117 West Bellevue Drive / Pasadena CA 91105-2503 /626-568-4065

ENVIRONMENTAL

Analytical Chemists

July 18, 2008

Lab ID : SP 0807287-001
Customer ID : 2-14

Babcock & Sons, Inc.
P.O. Box 432
Riverside, CA 92502

Sampled On : July 2, 2008-10:00
Sampled By : Christofer Coppinger
Received On : July 3, 2008-10:45
Matrix : Drinking Water

Description : Mooncamp FP2, Fawnskin, CA
Project : Geoscience Support Services, Inc. (A8G0240-01)

Sample Result - Radio

Constituent	Result ± Error	MDA	Units	MCL	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
Radio Chemistry[P:1]								
Gross Alpha	1.74 ± 1.33	1.43	pCi/L	15	900.0	07/09/08:206705	900.0	07/14/08:207955
Radon	447 ± 43.1	17.9	pCi/L		SM7500Rn	07/03/08:206570	SM7500Rn	07/07/08:207567

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (P) Plastic Preservatives: N/A

MCL = Maximum Contamination Level. MDA = Minimum Detectable Activity. Data utilized by the DHS to determine matrix interference.
CCR Section 64442: Compliance Note: If Gross Alpha (Result + (0.84 x error)) exceeds 5 pCi/L run Uranium. If Gross Alpha minus Uranium exceeds 5 pCi/L run Radium 226. Samples that exceed 5 pCi/L are held for 6 months at FGL.

Compliance:
Gross Alpha minus Uranium is less than or equal to 15 pCi/L
Uranium is less than or equal to 20 pCi/L
Radium 226 + Radium 228 is less than or equal to 5 pCi/L

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: 805/392-2000
FAX: 805/525-4172
CA NELAP Certification No. 01110CA

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: 209/942-0182
FAX: 209/942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
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FAX: 530/343-3807
CA ELAP Certification No. 2670

Field Office
Visalia, California
TEL: 559/734-9473
Mobile: 559/737-2399
FAX: 559/734-8435

FGL **ENVIRONMENTAL**

Analytical Chemists

July 18, 2008 Lab ID : SP 0807287

Babcock & Sons, Inc. Customer : 2-14

Quality Control - Radio

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Radio								
Alpha	900.0	07/14/2008:207955	CCV	cpm	11560	39.8 %	37 - 48	
			CCB	cpm		0.100	0.24	
Gross Alpha	900.0	07/09/2008:206705	Blank	pCi/L		0.01	3	
			LCS	pCi/L	146.4	86.9 %	75-125	
			MS	pCi/L	146.4	102 %	60-140	
		(SP 0807311-001)	MSD	pCi/L	146.4	92.6 %	60-140	
			MSRPD	pCi/L	146.4	9.2%	≤30	
Radon	SM7500Rn	07/03/2008:206570	Dup	pCi/L		1.2%	25	
	SM7500Rn	07/07/2008:207567	CCV	pCi/L	985.4	102 %	90-110	
			CCB	pCi/L		-2.8	20	

Definition

CCV	: Continuing Calibration Verification - Analyzed to verify the instrument calibration is within criteria.
CCB	: Continuing Calibration Blank - Analyzed to verify the instrument baseline is within criteria.
Blank	: Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
LCS	: Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
MS	: Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
MSD	: Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyted. The recoveries are an indication of how that sample matrix affects analyte recovery.
Dup	: Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.
MSRPD	: MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
DQO	: Data Quality Objective - This is the criteria against which the quality control data is compared.

Corporate Offices & Laboratory
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FAX: 209/942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: 530/343-5818
FAX: 530/343-3807
CA ELAP Certification No. 2670

Field Office
Visalia, California
TEL: 559/734-9473
Mobile: 559/737-2399
FAX: 559/734-8435

FGL ENVIRONMENTAL

Analytical Chemists
July 18, 2008

Babcock & Sons, Inc.
P.O. Box 432
Riverside, CA 92502

Lab ID : SP 0807287
Customer : 2-14

Laboratory Report

Introduction: This report package contains total of 4 pages divided into 3 sections:

Case Narrative	(2 pages)	: An overview of the work performed at FGL.
Sample Results	(1 page)	: Results for each sample submitted.
Quality Control	(1 page)	: Supporting Quality Control (QC) results.

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab ID #	Matrix
Mooncamp FP2, Fawnskin, CA	07/02/2008	07/03/2008	SP 0807287-001	DW

Sampling and Receipt Information: The sample was received, prepared and analyzed within the method specified holding times. All samples arrived at 6 °C. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the attached Chain of Custody and Condition Upon Receipt Form.

Quality Control: All samples were prepared and analyzed according to the following tables:

Radio QC

900.0	07/14/2008:207955 All analysis quality controls are within established criteria
	07/09/2008:206705 All preparation quality controls are within established criteria
SM7500Rn	07/07/2008:207567 All analysis quality controls are within established criteria
	07/03/2008:206570 All preparation quality controls are within established criteria

Discussion of Analytical Results: Amended Report
SP 0807287-001 Mooncamp FP2, Fawnskin, CA — Amended to include Laboratory Manager's signature.

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
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FAX: 805/525-4172
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Stockton, CA 95215
TEL: 209/942-0182
FAX: 209/942-0423
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Chico, CA 95926
TEL: 530/343-5818
FAX: 530/343-3807
CA ELAP Certification No. 2670

Field Office
Visalia, California
TEL: 559/734-9473
Mobile: 559/737-2399
FAX: 559/734-8435

July 18, 2008
Babcock & Sons, Inc.

Lab ID : SP 0807287
Customer : 2-14

Certification:: I certify that this data package is in compliance with NELAC standards, both technically and for completeness, except for any conditions listed above. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature.

KD:CEA

Approved By **Michel M. Franco, B.A.** Digitally signed by Michel M. Franco, B.A. Title: Radiochemistry Lab Manager Date: 2008-07-18

SUBCONTRACT ORDER

E.S. Babcock & Sons, Inc.

A8G0240

807287

SENDING LABORATORY:

E.S. Babcock & Sons, Inc.
P. O. Box 432
Riverside, CA 92502-0432
Phone: (951) 653-3351
Fax: (951) 653-1662
Project Manager: Humaira Saleem

RECEIVING LABORATORY:

FGL Environmental, Inc. - Subcontracts
853 Corporation Street
Santa Paula, CA 93060
Phone :(805) 392-2000
Fax: (805) 525-4172

Client: Geoscience Support Services Inc.
Sampler: Christofer Coppinger

No State Form

Analysis	Due	Expires Regulatory Days Past Date Sampled	Laboratory ID	Comments
Sample ID: A8G0240-01	**Water**	**Sampled:07/02/08 10:00**	**Mooncamp FP2, Fawnskin, CA**	
Radio-Radon	07/14/08 17:00	12/29/08 10:00		
Radio-Gross Alpha	07/14/08 17:00	12/29/08 10:00		If > 5 pci/L Run Uranium & Radium 226; If R226 > 3 pci/L Run Radium 228

Containers Supplied:
Half gal Poly-HNO3 (A) Quart Poly - HNO3 (B) Quart Poly - HNO3 (C) Quart Poly - HNO3 (D) 250 ml Amber-Unpres. (L)
250 ml Amber-Unpres. (M)

All Containers Intact: Yes ____No Samples Preserved Properly: ____Yes ____No

Samples Received at 6 oC Sample Lables / COC Agree: Yes ____No Custody Seals Present: Yes ____No

An acknowledgement of sample receipt is requested. Please reply to slozon@babcocklabs.com or Fax to 951-653-3351. Thank You.

Released By Date 7/2/08 Received By Date 7/3/08 1045a

Released By Date Received By Date

Page 1 of 1

NORTH COAST LABORATORIES LTD.

July 17, 2008

Edward S. Babcock & Sons, Inc
P.O. Box 432
Riverside, CA 92502-0432

Attn: Humaira Saleem

RE: A8G0240

Order No.: 0807067
Invoice No.: 75896
PO No.: A8G0240
ELAP No. 1247-Expires July 2008

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	A8G0240-01
01B	A8G0240-01
01D	A8G0240-01

ND = Not Detected at the Reporting Limit
Limit = Reporting Limit
All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Laboratory Supervisor(s) | QA Unit | Jesse G. Chaney, Jr. Laboratory Director

5680 West End Road • Arcata California 95521-9202 • 707-822-4649 • FAX 707-822-6831
Printed on Recycled Paper

North Coast Laboratories, Ltd. **Date:** 17-Jul-2008

CLIENT: Edward S. Babcock & Sons, Inc
Project: A8G0240
Lab Order: 0807067

CASE NARRATIVE

EPA 531.1:
The laboratory control sample (LCS) recovery was above the upper acceptance limit for aldicarb sulfone and oxamyl. The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries were above the upper acceptance limits for aldicarb. These recoveries indicate that the sample results may be erroneously high. There were no detectable levels of the analytes in the sample; therefore, the data were accepted.

EPA 547:
The samples for glyphosate analysis were poured off and frozen upon receipt at North Coast Laboratories. The holding time is extended to eighteen months when samples are frozen.

EPA 549.2:
Diquat strongly adsorbs to soil particles that are suspended in water. The strong chemical bonds make the herbicide chemically inactive. When bound with soil particles, the extraction procedure for method EPA 549.2 is ineffective at isolating the bound diquat. Any reported diquat represents the dissolved analyte in the water that has not been bound to the soil particles.

NORTH COAST LABORATORIES
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Printed on Recycled Paper

Date: 17-Jul-2008
WorkOrder: 0807067

ANALYTICAL REPORT

Client Sample ID: A8G0240-01 **Received:** 7/3/08 **Collected:** 7/2/08 10:00
Lab ID: 0807067-01A

Test Name: EPA 549.2 **Reference:** EPA 549.2

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Diquat (dissolved)	ND	0.40	µg/L	1.0	7/9/08	7/9/08

Client Sample ID: A8G0240-01 **Received:** 7/3/08 **Collected:** 7/2/08 10:00
Lab ID: 0807067-01B

Test Name: Glyphosate **Reference:** EPA 547

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Glyphosate	ND	10	µg/L	1.0	7/10/08	7/11/08

Client Sample ID: A8G0240-01 **Received:** 7/3/08 **Collected:** 7/2/08 10:00
Lab ID: 0807067-01D

Test Name: N-methyl -carbamoyloximes and carbamates **Reference:** EPA 531.1

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Aldicarb Sulfoxide	ND	3.0	µg/L	1.0	7/11/08	7/15/08
Aldicarb Sulfone	ND	4.0	µg/L	1.0	7/11/08	7/15/08
Oxamyl	ND	5.0	µg/L	1.0	7/11/08	7/15/08
Methomyl	ND	2.0	µg/L	1.0	7/11/08	7/15/08
3-OH-Carbofuran	ND	3.0	µg/L	1.0	7/11/08	7/15/08
Aldicarb	ND	3.0	µg/L	1.0	7/11/08	7/15/08
Propoxur	ND	5.0	µg/L	1.0	7/11/08	7/15/08
Carbofuran	ND	5.0	µg/L	1.0	7/11/08	7/15/08
Carbaryl	ND	5.0	µg/L	1.0	7/11/08	7/15/08
Methiocarb	ND	5.0	µg/L	1.0	7/11/08	7/15/08
Surrogate: BDMC	96.4	51.7-134	% Rec	1.0	7/11/08	7/15/08

NORTH COAST LABORATORIES
5680 West End Road • Arcata, California 95521-9202 • 707-822-4649 • FAX 707-822-6831
Printed on Recycled Paper

North Coast Laboratories, Ltd.

Date: 17-Jul-2008

CLIENT: Edward S. Babcock & Sons, Inc
Work Order: 0807067
Project: A8G0240

QC SUMMARY REPORT
Method Blank

Sample ID: MB	Batch ID: R53200	Test Code: 531W	Units: µg/L	Analysis Date 7/12/08 00:55:43	Prep Date: 7/11/08
Client ID:		Run ID: ORLC6_080714A		SeqNo: 774807	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldicarb Sulfoxide	ND	3.0									
Aldicarb Sulfone	ND	4.0									
Oxamyl	ND	5.0									
Methomyl	ND	2.0									
3-OH-Carbofuran	ND	3.0									
Aldicarb	ND	3.0									
Propoxur	ND	5.0									
Carbofuran	ND	5.0									
Carbaryl	ND	5.0									
Methiocarb	ND	5.0									
BDMC	17.9	0.10	20.0	0	89.3%	52	134	0			

Sample ID: MB	Batch ID: R53186A	Test Code: 547W	Units: µg/L	Analysis Date 7/10/08 23:23:41	Prep Date: 7/10/08
Client ID:		Run ID: ORLC6_080710A		SeqNo: 774628	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Glyphosate	ND	10									

Sample ID: MB-20563	Batch ID: 20563	Test Code: 549W	Units: µg/L	Analysis Date 7/9/08 17:35:45	Prep Date: 7/9/08
Client ID:		Run ID: ORLC2_080709A		SeqNo: 774339	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diquat (dissolved)	ND	0.40									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

North Coast Laboratories, Ltd.

Date: 17-Jul-2008

CLIENT: Edward S. Babcock & Sons, Inc
Work Order: 0807067
Project: A8G0240

QC SUMMARY REPORT
Laboratory Control Spike

Sample ID: **LCS**	Batch ID: **R53200**	Test Code: **531W**	Units: **µg/L**	Analysis Date **7/12/08 01:58:06**	Prep Date: **7/11/08**
Client ID:		Run ID: **ORLC6_080714A**		SeqNo: **774808**	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldicarb Sulfoxide	5.841	3.0	6.00	0	97.3%	70	105	0			
Aldicarb Sulfone	8.601	4.0	8.00	0	108%	72	107	0			S
Oxamyl	10.61	5.0	10.0	0	106%	67	105	0			S
Methomyl	3.971	2.0	4.00	0	99.3%	73	106	0			
3-OH-Carbofuran	6.448	3.0	6.00	0	107%	64	111	0			
Aldicarb	8.117	3.0	6.00	0	135%	73	111	0			S
Propoxur	10.12	5.0	10.0	0	101%	72	107	0			
Carbofuran	9.663	5.0	10.0	0	96.6%	69	115	0			
Carbaryl	10.42	5.0	10.0	0	104%	77	107	0			
Methiocarb	9.105	5.0	10.0	0	91.1%	69	111	0			
BDMC	18.7	0.10	20.0	0	93.4%	52	134	0			

Sample ID: **LCSD**	Batch ID: **R53200**	Test Code: **531W**	Units: **µg/L**	Analysis Date **7/12/08 03:00:28**	Prep Date: **7/11/08**
Client ID:		Run ID: **ORLC6_080714A**		SeqNo: **774809**	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldicarb Sulfoxide	5.785	3.0	6.00	0	96.4%	70	105	5.84	0.963%	20	
Aldicarb Sulfone	8.053	4.0	8.00	0	101%	72	107	8.60	6.57%	20	
Oxamyl	10.38	5.0	10.0	0	104%	67	105	10.6	2.20%	20	
Methomyl	3.879	2.0	4.00	0	97.0%	73	106	3.97	2.35%	20	
3-OH-Carbofuran	5.993	3.0	6.00	0	99.9%	64	111	6.45	7.32%	20	
Aldicarb	7.868	3.0	6.00	0	131%	73	111	8.12	3.11%	20	S
Propoxur	9.349	5.0	10.0	0	93.5%	72	107	10.1	7.92%	20	
Carbofuran	9.077	5.0	10.0	0	90.8%	69	115	9.66	6.25%	20	
Carbaryl	9.883	5.0	10.0	0	98.8%	77	107	10.4	5.27%	20	
Methiocarb	8.919	5.0	10.0	0	89.2%	69	111	9.10	2.06%	20	
BDMC	19.5	0.10	20.0	0	97.4%	52	134	18.7	4.20%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Edward S. Babcock & Sons, Inc
Work Order: 0807067
Project: A8G0240

QC SUMMARY REPORT
Laboratory Control Spike

Sample ID: LCS	Batch ID: R53186A	Test Code: 547W	Units: µg/L	Analysis Date 7/10/08 23:46:03	Prep Date: 7/10/08
Client ID:		Run ID: ORLC6_080710A		SeqNo: 774629	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Glyphosate	52.31	10	50.0	0	105%	73	128	0			

Sample ID: LCSD	Batch ID: R53186A	Test Code: 547W	Units: µg/L	Analysis Date 7/11/08 00:08:21	Prep Date: 7/10/08
Client ID:		Run ID: ORLC6_080710A		SeqNo: 774630	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Glyphosate	52.22	10	50.0	0	104%	73	128	52.3	0.172%	20	

Sample ID: LCS-20563	Batch ID: 20563	Test Code: 549W	Units: µg/L	Analysis Date 7/9/08 17:53:33	Prep Date: 7/9/08
Client ID:		Run ID: ORLC2_080709A		SeqNo: 774340	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diquat (dissolved)	1.557	0.40	2.00	0	77.9%	59	102	0			

Sample ID: LCSD-20563	Batch ID: 20563	Test Code: 549W	Units: µg/L	Analysis Date 7/9/08 18:11:22	Prep Date: 7/9/08
Client ID:		Run ID: ORLC2_080709A		SeqNo: 774341	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diquat (dissolved)	1.520	0.40	2.00	0	76.0%	59	102	1.56	2.39%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SUBCONTRACT ORDER

E.S. Babcock & Sons, Inc.

A8G0240 0807067

SENDING LABORATORY:

E.S. Babcock & Sons, Inc.
P. O. Box 432
Riverside, CA 92502-0432
Phone: (951) 653-3351
Fax: (951) 653-1662
Project Manager: Humaira Saleem

RECEIVING LABORATORY:

North Coast Labs - Subcontract
5680 West End Road
Arcata, CA 95521
Phone :(707) 822-4649
Fax: (707) 822-6831

Client: Geoscience Support Services Inc.
Sampler: Christofer Coppinger

No State Form

Analysis	Due	Expires Regulatory Days Past Date Sampled	Laboratory ID	Comments
Sample ID: A8G0240-01	**Water**	**Sampled:07/02/08 10:00**	**Mooncamp FP2, Fawnskin, CA**	
549-Diquat	07/14/08 17:00	07/09/08 10:00		
547	07/14/08 17:00	07/16/08 10:00		
531	07/14/08 17:00	07/30/08 10:00		
Containers Supplied:				
Quart Poly - Unpres (G)	Voa Vial MCAA, Na2S2O3	Voa Vial MCAA, Na2S2O3	Voa Vial -Unpres (J)	Voa Vial -Unpres (K)

All Containers Intact: X Yes ____No Samples Preserved Properly: X Yes ____No

Samples Received at 0.4 oC Sample Lables / COC Agree: X Yes ____No Custody Seals Present: ____Yes X No

An acknowledgement of sample receipt is requested. Please reply to slozon@babcocklabs.com or Fax to 951-653-3351. Thank You.

Released By	7/2/08 Date	Received By	7/3/08 Date	1040
Released By	Date	Received By	Temp Date	0.4°C

Page 1 of 1

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Cathy Iijima
Edward S. Babcock & Sons, Inc.
6100 Quail Valley Court
Riverside CA 92507

REPORT OF LABORATORY ANALYSIS FOR 2,3,7,8-TCDD

Report Summary:

This report contains results of one drinking water sample analyzed to determine 2,3,7,8-TCDD content. This sample was analyzed according to Method 1613 by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

Report Prepared Date:

July 18, 2008

Report Information:

Pace Project #: 1076418
Sample Receipt Date: 07/03/2008
Client Project #: A8G0240
Client Sub PO #: N/A
State Cert #: 01155CA

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 Drinking Water Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Nate Habte, your Pace Project Manager.

This report has been reviewed and prepared by:

For Nate Habte

Nate Habte, Project Manager
(612) 607-6407
(612) 607-6444 (fax)
natnael.habte@pacelabs.com

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

1150

SUBCONTRACT ORDER

E.S. Babcock & Sons, Inc.

A8G0240

1076418

SENDING LABORATORY:	**RECEIVING LABORATORY:**
E.S. Babcock & Sons, Inc. P. O. Box 432 Riverside, CA 92502-0432 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Humaira Saleem	Pace Analytical - Subcontract 1700 Elm Street SE, Suite 200 Minneapolis, MN 55414 Phone :(612) 607-6383 Fax: 9612) 607-6444

Client: Geoscience Support Services Inc.
Sampler: Christofer Coppinger

No State Form

Analysis	Due	Expires Regulatory Days Past Date Sampled	Laboratory ID	Comments
Sample ID: A8G0240-01	**Water**	**Sampled:07/02/08 10:00**	**Mooncamp FP2, Fawnskin, CA**	001
Dioxin *Containers Supplied:* 1L Amber-Na2S2O3 (F)	07/14/08 17:00	07/30/08 10:00	D.W. as per Humaira Saleem 7/3/08 MAH	

All Containers Intact: X Yes ___No Samples Preserved Properly: X Yes ___No

Samples Received at 5.2 oC Sample Lables / COC Agree: X Yes ___No Custody Seals Present: X Yes ___No

An acknowledgement of sample receipt is requested. Please reply to slozon@babcocklabs.com or Fax to 951-653-3351. Thank You.

Released By	Date	Received By	Date
[signature]	7/2/08	[signature] Pace	7/3/08 9:39
Released By	Date	Received By	Date

Page 1 of 1

Report No.....1076418_1613DW

Sample Condition Upon Receipt

Pace Analytical

Client Name: E.S. Babcock Project # 1076418

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 1Z5781X90149296375

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☒ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____

Thermometer Used 230184016, 72310129 Type of Ice: Wet (Blue) None ☐ Samples on ice, cooling process has begun

Cooler Temperature 5.7°c Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 7/3/08

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☒No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☐Yes ☐No ☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: MAH Date: 7/7/08

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical™

Pace AnalyticalServices, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612-607-6444

Drinking Water Analysis Results
2,3,7,8-TCDD -- USEPA Method 1613B

Sample ID.....A8G0240-01
Client.....Edward S. Babcock & Sons, Inc.
Lab Sample ID.....1076418001

Date Collected.....07/02/2008
Date Received.....07/03/2008
Date Extracted.....07/15/2008

	Sample A8G0240-01	Method Blank	Lab Spike	Lab Spike Dup
[2,3,7,8-TCDD]	**ND**	ND	--	--
RL	5 pg/L	5 pg/L	--	--
2,3,7,8-TCDD Recovery	--	--	97%	93%
Spike Recovery Limit	--	--	73-146%	73-146%
RPD			4.1%	
IS Recovery	**79%**	80%	76%	76%
IS Recovery Limits	31-137%	31-137%	25-141%	25-141%
CS Recovery	**87%**	83%	81%	83%
CS Recovery Limits	42-164%	42-164%	37-158%	37-158%
Filename	D80717A19	D80716A06	D80716A03_08071	D80716A04
Analysis Date	07/17/2008	07/16/2008	07/16/2008	07/16/2008
Analysis Time	18:20	11:36	10:02	10:32
Analyst	JB	JB	JB	JB
Volume	0.950L	1.030L	1.035L	1.045L
Dilution	NA	NA	NA	NA
ICAL Date	07/08/2008	07/08/2008	07/08/2008	07/08/2008
CCAL Filename	D80717A02	D80716A02	D80716A02	D80716A02

! = Outside the Control Limits
ND = Not Detected
RL = Reporting Limit
Limits = Control Limits from Method 1613 (10/94 Revision), Tables 6A and 7A
RPD = Relative Percent Difference of Lab Spike Recoveries
IS = Internal Standard [2,3,7,8-TCDD-$^{13}C_4$]
CS = Cleanup Standard [2,3,7,8-TCDD-$^{37}Cl_4$]

Analyst: Julie Brenner

Project No.....1076418

Report No.....1076418_1613DW

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

6100 Quail Valley Court Riverside, CA 92507
(951) 653-3351 • FAX (951) 653-1662
www.babcocklabs.com

Chain of Custody & Sample Information Record

Client: Geoscience Support Services Contact: Russ Kyle Fax No. 909 920 0403
Phone No. 909 920 0707 email: Rkyle @ geoscience-water.com
Project Name: Mooncamp FP2 Turn Around Time: (Routine) *72 Hour Rush *48 Hour Rush *24 Hour Rush
Project Location: Fawnskin CA *Lab TAT Approval: By: *Additional Charges Apply

Additional Reporting Requests
Include QC Data Package: ☐ Yes ☐ No
FAX Results: ☐ Yes ☐ No
Email Results: ☐ Yes ☐ No
State EDT: ☐ Yes ☐ No
(Include Source Number in Notes)

Sampler Information
Name: Christofer Coppinger
Employer: Geoscience Support Service
Signature: Christof Coppinger

Sample ID	Date	Time	# of Containers & Preservatives: Unpreserved	H_2SO_4	HCl	HNO_3	$Na_2S_2O_3$	NaOH	NaOH/Zn Acetate	NH_4Cl	MCAA	$NaSO_3$	Total # of Containers	Sample Type: Routine	Resample	Special (Mtbx*)	Analysis Requested: See 2 attached Sheets. Uranium and Radium 226 only if Gross Alpha greater than 5pCi/L. Ra 228 only if 226 is greater than 3pCi/L	Matrix	Notes
1 Liter Amber	7/2/08	10:00					9						9					GW	Temp 15.5c
½ gal Poly			2										2						TDS 290 PPM
1 quart Poly			5			1							6						Turbit. 1.36 NTU *
1 pint Poly			1					1					2						pH 6.9
~~2~~ Radon			2										2						
VOA Vials			5		3						2		10						* No filter note in comments per Lorenzo. AD 7/2/08
liters Amber												2	2						
													31						

DW = Drinking Water
WW = Waste Water
GW = Ground Water
S = Soil
SG = Sludge
L = Liquid
M = Miscellaneous

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (sign)	Print Name / Company
Christ Coppinger	Chris Coppinger	7/2/08 13:00	Matthew Reynolds	N. Reynolds / GEOSCIENCE
Matthew Reynolds	N. Reynolds / GSST	7/2/08 14:50		C Ijima / ESB

(For Lab Use Only) Sample Integrity Upon Receipt Lab Notes

Sample(s) Submitted on Ice? (Yes) No Temperature 6°C
Custody Seal(s) Intact? Yes No (NA)
Sample(s) Intact? (Yes) No ☐ Cooler Blank

Lab No. AB 02246
Page 1 of 1
Rev. 6/07

APPENDIX C

Microscopic Particulate Analysis Report

BioVir Laboratories, Inc.

NELAC #05234CA
EPA ID #01401, CA-ELAP # 1795

685 Stone Road, Unit 6 · Benicia, CA 94510 · (707) 747-5906 · 1-800-GIARDIA · FAX (707) 747-1751 · WEB: www.biovir.com

REPORT OF SAMPLE EVALUATION

REPORT: 081588-1

PAGE: 1 of 2

CLIENT: Geoscience Support Services
Attention: Russ Kyle
PO Box 220
Claremont, CA 91711

CLIENT NO.: GEO007

SAMPLE INFORMATION:

Name of Sampler:	Christofer Coppinger	Sample Date:	07/02/08
Sample Source:	New Well Discharge	Sample Time:	09:10
Sample Location:	Mooncamp FP-2	Turbidity:	1.36
Filter Type:	Parker Hannifan, M39R10A	Temperature:	15.5
Sample Volume:	996.8 Gallons	Comments:	Drinking Water

Sample Received Date:	07/03/08
Sample Received Time:	08:10
Sample Received Temp:	7.9 C

ASSAY RESULTS:

1. Giardia species Assay: 0 Giardia species cyst seen / 3394 Liters.
   (SM 18TH; SEC. 9711B; FA)

2. Cryptosporidium Assay: 0 Cryptosporidium oocyst seen / 3394 Liters.
   (SM 18TH; SEC. 9711B; FA)

3. Microscopic Particulate Analysis: See page 2
   (EPA 910/9-92-029)

Commentary:
An aliquot representing 378.5 Liters was taken from the 3773 Liter sample concentrate for particulate analysis.

1 Gallon = 3.785 Liters

REPORT NO.: 081558-1
PAGE NO.: 2 of 2
CLIENT NO.: GEO007

MICROSCOPIC PARTICULATE ANALYSIS

PRIMARY PARTICULATES (per 378.5 Liters)		SECONDARY PARTICULATES (per 378.5 Liters)	
Giardia:	NS	*Plant Pollen:	127
Cryptosporidium:	NS	Nematodes:	NS
Diatoms:	NS	Crustacea:	NS
Other Algae:	NS	Amoeba:	NS
Insect/Larvae:	NS	Ciliates/Flagellates:	NS
Rotifers:	NS	Other Organisms:	NS
Plant Debris:	NS		

Key: * Plant Pollen = Pine

EH - extremely heavy
H - heavy
M - moderate
R - rare
NS - none seen

SAMPLE EVALUATION PERFORMANCE CRITERIA: The precise rates of recovery of organisms from environmental samples cannot be determined. BioVir Laboratories has analyzed your sample(s) in accordance with the method described with each analyte above, however, due to inherent limitations of these methods organisms may avoid detection. For additional information regarding the limitations of the method(s) referred to above please call us at 1-800-GIARDIA.
COMPANY IS NOT AN INSURER: BioVir Laboratories is not an insurer or guarantor of the quality and/or purity of water, wastewater, biosolid or other material from which the sample was taken. BioVir offers no express or implied warranties whatsoever concerning the quality or purity of any water, wastewater, biosolid or other material which is ultimately consumed, distributed, applied or otherwise disposed of.

07/07/08
COMPLETION DATE

Richard E Daniel
SIGNATURE/DATE 07/23/08

F:\WP\REPDIR\Geo007 GeoScience-See Sou013\081588-1.wpd

BioVir LABORATORIES ®

MICROSCOPIC PARTICULATE ANALYSIS

Primary Particulates

Numerical range of each primary bio-indicator based on numbers counted per 378.5 Liters sampled

Surface Water	EH	H	M	R	NS
Giardia	**	**	**	**	None Seen
Coccidia	**	**	**	**	None Seen
Diatoms	>150	41-149	11-40	1-10	None Seen
Other Algae	>300	96-299	21-95	1-20	None Seen
Insects/Larvae	>100	31-99	16-30	1-15	None Seen
Rotifers	>150	61-149	21-60	1-20	None Seen
Plant Debris	>200	71-199	26-70	1-25	None Seen

Giardia lamblia Giardia species Cryptosporidium	**	Assayed by Immunofluorescent Method. The presence of any amount of these organisims represents a HIGH RISK to surface water contamination.

Key:

EH - extremely heavy
H - heavy
M - moderate
R - rare
NS - none seen

SECONDARY PARTICULATES

Secondary bio-indicators are reported as a number based on relative concentration per 100 gallons sampled and should be used only to support information derived from the primary bio-indicator category.

BioVir Laboratories, Inc., 685 Stone Road, Benicia, California 94510
Phone: 1-800-GIARDIA (442-7342) Fax: 707-747-1751

1-800-GIARDIA

RELATIVE SURFACE WATER RISK FACTOR

Indicators of Surface Water	EH	H	M	R	NS
Giardia	40	30	25	20	0
Coccidia	35	30	25	20	0
Diatoms	16	13	11	6	0
Other Algae	14	12	9	4	0
Insects/Larvae	9	7	5	3	0
Rotifers	4	3	2	1	0
Plant Debris	3	2	1	0	0

Indicators of Surface Water:

According to EPA "Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources", March, 1991 ed.

Range of Indicators Key:

EH - extremely heavy
H - heavy
M - moderate
R - rare
NS - none seen

RISK OF SURFACE WATER CONTAMINATION

High Risk	=	20 or greater
Moderate Risk	=	10-19
Low Risk	=	9 or less

\\Biovirserver\F\WP\FORMS\MPA.TBL

BioVir LABORATORIES ®

GIARDIA / CRYPTOSPORIDIUM / MPA ASSAY SAMPLE DATA SHEET

(Please fill out applicable areas, sign and return to BioVir with the sample.)
Phone: 1-800-GIARDIA Fax: 707-747-1751 WEB: www.biovir.com

LAB USE ONLY:
LIMS #: 0815887
Client #: GE0007
Date Rec'd: 7/3/05
Time Rec'd: 0810
Temp Rec'd: 7.9

Note: Please print clearly using waterproof ink

NAME & ADDRESS: Geoscience Support Services PO 220 Jamestown CA 95327	SAMPLE DATE: [illegible] SAMPLE TIME: 09:10 AM
	Water Temp (C): 15.5 Turbidity (NTU): 1.36
PWS ID: FACILITY ID:	TREATMENT CHARACTERISTICS (Check One):
NAME OF SAMPLER: Chris Tover Coppinger	Raw Surface Water ☐ Treated Drinking Water ☐
SAMPLE SOURCE: [illegible] FP-2	Treated Wastewater ☐ Wastewater ☐
	Ground Water ☒ Other: Mine Discharge
SAMPLE LOCATION: [illegible]	DECHLORINATION/ DISINFECTANT NEUTRALIZATION (If Treated Water): Yes NO
SAMPLE COLLECTION POINT ID:	SAMPLE DESCRIPTION (G/C)
SAMPLE VOLUME: (Meter # [illegible] 1591) Meter Start: 1760283 Meter Stop: 1860485	Regular Grab Sample ☐ Matrix Spike Grab ☐ Regular Filtered Sample ☒
Total Volume: 20 Gallons _____ Liters	Matrix Spike Grab / Matrix Spike Filter Pair ☐ Filtered Volume: _____ Liters Grab Volume: _____ Liters

Client Sample ID: [illegible] FP-2	P.O. #:

ASSAY REQUESTED: Please check one of the following

LT2 Samples: Special care should be taken for samples intended to satisfy the requirements of the Long Term 2 Enhanced Surface Water Treatment Rule. Samples must be at least 10 Liters in volume (at least 22lbs. plus vessel for grab samples). Samples must arrive at BioVir between 0 to 20 degrees C (not frozen). Pre-chill samples during sampling or before shipment for best results.

METHOD 1623: Cryptosporidium and Giardia (EPA 821-R-01-025)	
	REGULAR SAMPLE ☐ (Check if repeat sample for LT2. Original Sample Date:)
	MATRIX SPIKE SAMPLE -Required in addition to the first sample from a source and every 20 samples thereafter (e.g. 21st, 41st, etc.)
METHOD 1622: Cryptosporidium Only (EPA 821-R-01-026)	
	REGULAR SAMPLE ☐ (Check if repeat sample for LT2. Original Sample Date:)
	MATRIX SPIKE SAMPLE -Required in addition to the first sample from a source and every 20 samples thereafter (e.g. 21st, 41st, etc.)
MICROSCOPIC PARTICULATE ANALYSIS (MPA)	
✓	Microscopic Particulate Analysis (MPA) - (EPA 910/9-92-029)
OTHER ANALYTES (Please indicate Analyte & Method)	

COMMENTS:

COPY

RELINQUISHED BY: [illegible]	DATE / TIME:
RECEIVED BY: [illegible]	DATE / TIME: 7/3/05

SHIPPING ADDRESS: BIOVIR LABORATORIES, INC., 685 STONE ROAD, UNIT 6, BENICIA, CALIFORNIA 94510
WHITE = BIOVIR COPY YELLOW = CUSTOMER COPY

F:\WP\FORMS\Datasheets\G&C and MPA Data Sheet 04.05.07.doc

G.4 - Water Supply Analysis (California Collaborative Solutions, February 2009)

Nancy @ CWA

California Collaborative Solutions

Water Supply Analysis

Tentative Tract No. 16136

Moon Camp Tract

Fawnskin, Ca

February 11, 2009

P.O. Box 706 Big Bear City, CA 92314 909 586-5819 calcolsol@gmail.com

Tentative Tract No. 16136 --- Moon Camp

Water Supply Analysis

February 11, 2009

Background:

The Moon Camp Tract was originally proposed as a 92 lot subdivision. An existing, onsite domestic water well, FP2, was proposed to provide the water supply for the subdivision. Well FP2 extracts its groundwater from Sub Area "A" of the North Shore Groundwater Basin. During the evaluation of the Water Supply, it was determined that the Perennial Yield of Sub Area "A" is between 14 and 44 acre-feet per year (Geoscience Support Services, December 2, 2003 Focused Geohydrologic Evaluation, Summary of North Shore Subareas, Page 3, copy attached). The Geoscience Focused Evaluation and the DWP's Master Plan (November, 2006, Table 4-2, copy attached) uses the mid-point of this range, 29 acre-feet per year, as Sub Area A's annual yield. However, County Planning Staff stated that they would only support a project that utilized the most conservative 14 acre-feet per year. ALDA Engineering completed a Final Feasibility Study that determined that 50 lots (occupied full-time) could be served by the 14 acre-feet per year (DWP report dated March 6, 2007, Page 2, copy attached). As a result, the Proposed Subdivision was redesigned as 50, one-half acre minimum lots.

During the preparation of the Draft EIR by MBA, it was discovered that the existing Private Well production within Sub Area "A" is 5 acre-feet per year (Table 4-2, DWP Water Master Plan, November, 2006, copy attached). In order to provide 5 acre-feet per year of groundwater yield to the subdivision from a groundwater basin other than Sub Area "A", the developer has drilled Well FP4 in the adjoining Grout Creek Groundwater Basin. The Grout Creek Basin has a Perennial Yield of 280 acre-feet per year; existing private well production of 7 acre-feet per year; and DWP domestic well production of 121 acre-feet per year (Tables 4-1 and 4-2, DWP Water Master Plan, November, 2006, copies attached). Based on this data, the Grout Creek Basin has 152 acre-feet per year of Perennial Yield available.

Water Well FP2:

In order to produce 9 - 14 acre-feet per year from Sub Area "A", Well FP2 would need to pump at a rate of 5.6 – 8.7 gpm. In June, 2008, Well FP2 was cleaned, pump tested and a Title 22 Water Quality Analysis was performed (Geoscience Support Services Report, August 7, 2008, copy attached). Geoscience concluded:

- Well FP2 can be pumped at a rate of 35 gpm on a long-term basis with less than 10 feet of drawdown in the well (Well FP2 is 380' deep and the static water level is 2 feet below ground surface)
- At the 35 gpm discharge rate, pumping interference with the closest private well is expected to be less than 0.3 feet (the nearest private well is approximately 1,000 feet to the east of Well FP2)

- Title 22 Ground water quality data from Well FP2 indicates the water from the well is suitable for municipal supply

The 35 gpm rate from Well FP2 can produce 56 acre-feet per year and supports Geoscience's Focused Evaluation and the DWP Master Plan's conclusion that Sub Area A can produce 29 acre-feet per year.

Water Well FP4:

In December of 2008, Harich Enterprises drilled Well FP4 to a depth of 240 feet. Well FP4 is located in the north-west corner of the proposed subdivision, within the Grout Creek Groundwater Basin. In order to produce 5 acre-feet per year from the Grout Creek Basin, Well FP4 would need to pump at a rate of 3.1 gpm. Harich pump tested Well FP4 at 3.4 gpm (Harich Driller's Report, February, 2009, copy attached) and the County's Special Districts Department obtained Title 22 Water Quality samples for analysis. The results concluded:

- Well FP4 can be pumped at a rate of 3.4 gpm on a long-term basis with 87 feet of drawdown in the well (Well FP4 is 240 feet deep and the static water level is 22 feet below ground surface)

The 3.4 gpm pumping rate from Well FP4 will produce 5.5 acre-feet per year from the Grout Creek Basin.

Water Service Provider:

Based upon the January 24, 2008 letter from LAFCO Executive Officer Kathleen Rollings-McDonald (copy attached), County Service Area 53C can own and operate the Moon Camp Subdivision Water System, including Water Wells FP2 and FP4. Special Districts staff has stated that they would operate the water system with their existing staff. Currently, Special Districts staff operate the Fawnskin Sewer System through CSA 53B.

Conclusion:

The combined pumping capacity of FP2 and FP4 is more than adequate to meet the long term water supply needs of the proposed 50 lot subdivision without adverse impacts to either Sub-Area "A" of the North Shore Basin, or the Grout Creek groundwater basin.

References:

GEOSCIENCE Support Services Inc., 2003. Focused Geohydrologic Evaluation of the Maximum Perennial Yield of the North Shore and Grout Creek Hydrologic Subunit Tributary Subareas. Prepared for the City of Big Bear Lake, Department of Water and Power. December 2, 2003.

ALDA Engineering, Inc., 2007. Final Feasibility Study to Serve the Proposed Moon Camp Residential Development (Tentative Tract No. 16136). Prepared for the City of Big Bear Lake, Department of Water and Power. March 6, 2007.

Camp, Dresser & McKee, Inc., 2006. Water Master Plan. Prepared for the City of Big Bear Lake, Department of Water and Power. November, 2006.

GEOSCIENCE Support Services Inc., 2008. Results of Rehabilitation and Aquifer Testing Moon Camp Well FP-2. Prepared for California Collaborative Solutions. August 7, 2008.

HARICH Enterprises, 2009. Well FP4 Driller's Report. February, 2009.

Local Agency Formation Commission. 2008. Memorandum, Water Service to Tentative Tract 16136; Moon Camp Residential Subdivision. Prepared by Kathleen Rollings-McDonald, Executive Officer. January 24, 2008.

Focused Geohydrologic Evaluation of the Maximum Perennial Yield of the North Shore and Grout Creek Hydrologic Subunit Tributary Subareas

Prepared for: City of Big Bear Lake Department of Water and Power

December 2, 2003

GEOSCIENCE Support Services, Inc.
Tel: (909) 920-0707
Fax: (909) 920-0403
Mailing: P. O. Box 220, Claremont, CA 91711
1326 Monte Vista Ave., Suite 3, Upland, CA 91786
email: email@geoscience-water.com

- Long-term precipitation records from weather stations within the Big Bear Lake watershed,
- Evapotranspiration data from evaporation pans and weather stations within the watershed,
- Ground water levels, and
- Ground water production.

However, most of the input parameters that are required for a detailed evaluation of the average annual ground water recharge had to be estimated or assumed from data collected outside the Grout Creek and North Shore subunits or outside the Big Bear Lake Watershed due to lack of measured data in the area. Although the assumed values are published and are from reliable sources (i.e. the U.S. Environmental Protection Agency, United States Geological Survey, etc.), they are not specific to the area of interest. Numerous additional monitoring features can be developed to collect the data necessary to refine the ground water recharge estimates. However, priority should be given to the construction of monitoring wells and the development of a reliable ground water level baseline for the tributary subareas.

The results of the ground water recharge analysis for the North Shore Subunit are as follows:

Summary of Ground Water Recharge Results
North Shore Tributary Subareas

Tributary Subarea	Area [acres]	Annual Precipitation [inches]	Average Annual Ground Water Recharge - Low Estimate [acre-ft/yr]	Average Annual Ground Water Recharge - High Estimate [acre-ft/yr]	Average of Ground Water Recharge Estimate Range [acre-ft/yr]
A	247	27.87	14	44	29
B	720	25.45	36	110	73
C	828	23.01	37	107	72
D	558	21.45	22	63	43
E	392	20.01	15	39	27
F	814	18.27	23	66	44

WATER MASTER PLAN

November 2006

Department of Water and Power

Big Bear Lake, California

Mission

The mission of the DWP is to manage our limited water resources through responsible planning in order to assure quality water and essential services in the most cost-effective manner for our current and future customers.

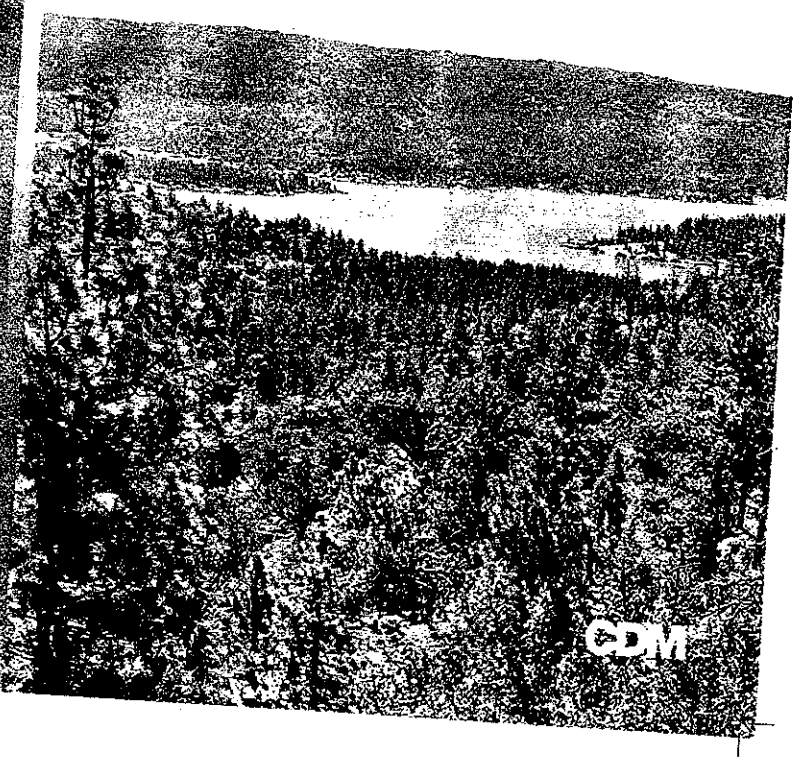


Table 4-1
Current and Projected Annual Demand and Supply Requirements by Pressure Zone

Current and Projected Annual Demand and Supply Requirements by Pressure Zone

Pressure Zone	Current		Full Development			
			25% Full-Time Equivalent		50% Full-Time Equivalent	
	Consumption (ac-ft/yr)	Supply (ac-ft/yr)	Consumption (ac-ft/yr)	Supply (ac-ft/yr)	Consumption (ac-ft/yr)	MDD (gpm)
Erwin Lake / Sugarloaf/ Lake William						
Erwin Lake	87	93	144	154	194	208
Lower Sugarloaf	173	186	225	241	339	363
Upper Sugarloaf	86	92	120	129	201	215
Lake William	28	29	45	48	57	61
Sub-total	374	400	535	572	791	846
Moonridge						
Wolf Booster	31	33	53	56	84	90
Wolf Tank	117	125	162	173	284	303
Lassen	54	58	70	75	104	111
Miriton	11	12	17	18	30	32
Travertine	4	5	8	9	14	15
Lower Moonridge	162	173	207	221	286	306
High Timber Ranch	-	-	45	48	64	68
Sub-total	378	405	562	601	865	926
Big Bear Lake						
Town [1]	1,585	1,696	2,370	2,536	2,847	3,046
Conklin Booster	14	15	26	27	41	44
Ironwood Booster	18	19	35	37	48	51
Sub-total	1,617	1,730	2,431	2,601	2,935	3,141
Unmatched	61	65	--	--	--	--
"BIG FOUR" TOTAL:	2,431	2,601	3,527	3,774	4,591	4,913
Fawnskin						
Lower Fawnskin	102	109	172	184	224	240
Upper Fawnskin	19	20	32	35	51	54
Sub-total	121	129	204	219	275	294
Rim Forest	47	50	47	50	47	50
OVERALL TOTAL	2,598	2,780	3,778	4,043	4,913	5,257

(1) Includes Knickerbocker and Ponte pressure zones.

Table 4-2
Maximum Perennial Yield Estimate by Subunit (ac-ft/yr)

Maximum Perennial Yield Estimates by Hydrologic Subunit (ac-ft/yr)			
Subunit	*Perennial Yield Estimate*	*Private Wells Production*	*Available to DWP (ac-ft/yr)*
Grout Creek [1]	280	7	273
Mill Creek	100-175	3	147
Village	250	3	247
Rathbone	1,100	135	965
Division	496	2	494
North Shore			
Sub-Area A [1]	29	5	24
Sub-Area B	71		71
Sub-Area C	70		70
Sub-Area D	43		43
Sub-Area E	27		27
Sub-Area F	44		44
Erwin [2]	890	14	576
TOTAL:	3,400 - 3,475	169	2,981

(1) Assumed to be available to the Fawnskin system only.

(2) Only 576 ac-ft/yr are available to DWP from the Erwin Lake Subunit as an estimated 300 ac-ft/yr are produced by CSD. An additional 14 ac-ft/yr are produced by private wells

The Perennial Yield from the Grout Creek subunit (280 ac-ft per year) and from Sub A of the North Shore subunit (29 ac-ft per year) is only available to the Fawnskin area. However, only 297 ac-ft per year are available to the DWP as an estimated 12 ac-ft per year are pumped by private wells. Therefore, an estimated 2,684 ac-ft per year are available to DWP to meet the water needs of the "Big Four" system on the south side of the lake. This number assumes that DWP would be able to develop all water sources in the remaining sub-areas in the North Shore subunit given that they are located in United States Forest Service (USFS) lands.

A comparison of supply requirements from Table 4-1 with available local supplies from Table 4-2 indicates that local supplies are capable of meeting current and projected water demands in the Fawnskin system. Local groundwater supplies available to the "Big Four" system are sufficient to meet current water demand of 2,601 ac-ft per year in that system; however, there would be a need to either reduce projected demands through conservation, secure additional supplies, or a combination of both options to meet demands at full development or resulting from conversion to full-time equivalent use. The supply deficit in the "Big Four" is estimated at approximately 1,090 ac-ft per year to meet projected demands at full development assuming the current distribution of full-time equivalent use is maintained; an additional 1,139 ac-ft per year of new supplies would be required to address the impact from demographics.

ALDA Engineering Inc.
9996 Orange Street
Alta Loma, CA 91737
Tel: 909-297-3741
Fax: 909-498-0423

March 6, 2007

Mr. Scott Heule, C.E.G./C.H.G., Assistant General Manager
City of Big Bear Lake
Department of Water & Power
41972 Garstin Drive
Big Bear Lake, CA 92315

Subject: **Final Feasibility Study to Serve the Proposed Moon Camp Residential Development** (Tentative Tract No. 16136)

Dear Mr. Heule:

Pursuant to your request, ALDA Engineering Inc. (ALDA) has conducted a feasibility study to determine the necessary system facilities to serve the above referenced development. This report summarizes the results of our investigation and recommendations. This report presents the project background, an assessment of demand and supply issues, the results of the system analysis, and the recommended improvements.

Project Background

The proposed Moon Camp development consists of 50 residential lots to be developed over approximately 62 acres of land. The proposed development is located along North Shore Drive, in the community of Fawnskin on the north side of Big Bear Lake, and ranges in elevation from approximately 6,750 ft. near the lake to approximately 6,950 ft. in the northeasterly quadrant. Individual lots range in size from approximately half an acre to well over two acres depending on location and are anticipated to be developed as single family residential units; average lot size is approximately one and a quarter acres. Because of its location and lot size, some of the residential units are anticipated to be fairly large and potentially exceed 4,000 square feet in size.

Water service to the proposed development will be provided off the Upper Fawnskin pressure zone as the Lower Fawnskin zone would not provide enough static head to provide the development adequate fire flow. DWP's closest pipeline off the Upper Fawnskin system is a single 6-inch diameter pipeline located near the intersection of Flicker Road and Chinook Road, approximately 2,000 ft away from the westerly boundary of the proposed development. Significant transmission improvements in the Fawnskin system are needed to provide fire flow to the proposed tract.

Currently, there are two groundwater production wells within the proposed residential tract. These wells are located in subarea A of the North Shore hydrologic subunit. It is our understanding that these wells will be deeded to the DWP at the time the tract map is recorded. The developer plans to equip the FP-2 well initially to meet the development projected water demands. The DWP will use excess capacity from this well to help reduce reliance on the leased North Shore Well No. 1. Groundwater production capacity from this well is estimated at approximately 100 gallons per minute. The second well (FP-3), located to the east of the FP-2 well, will not be initially equipped by DWP.

Pressure Zone Service Area

Based on the elevation range of the proposed development, 6,750 ft. to 6,950 ft., the development can be served off the Upper Fawnskin pressure zone. This pressure zone has an operating hydraulic grade of 7,113 ft. set by the high water level of the existing 0.25-million gallon Racoon Reservoir. Based on this hydraulic elevation, static pressures would range from a low of 71 psi at the highest point in Lot 18 to 157 psi near the lake. Individual pressure regulators would be required for all lots with static pressures exceeding 80 psi.

Water supply in the Fawnskin area is provided by two groundwater wells in the Lower Fawnskin pressure zone and by slant wells in the vicinity of the Racoon Reservoir. Excess groundwater production from the Lower Fawnskin pressure zone is conveyed to the Upper Fawnskin pressure zone through a booster station located at the Cline Miller Reservoir.

Water Demand

Projected water demand for the proposed development is based on the average consumption rate of 250 gallons per day per connection. Maximum day demand is estimated based on information provided in the recently completed water master plan and it is equivalent to 1.76 times the average day demand. Therefore, the average and maximum day demands for the proposed 50-lot subdivision are estimated as follows:

- Average Day Demand (ADD) = 12,500 gpd or 8.68 gpm
- Maximum Day Demand (MDD) = 15.27 gpm

Based on an estimated average day demand of 12,500 gallons, the annual water demand for the development is estimated at 4.56 million gallons or 14.00 ac-ft per year.

LOCAL AGENCY FORMATION COMMISSION
COUNTY OF SAN BERNARDINO

215 North "D" Street, Suite 204
San Bernardino, CA 92415-0490 • (909) 383-9900 • Fax (909) 383-9901
E-mail: lafco@lafco.sbcounty.gov
www.sbclafco.org

RECEIVED
JAN 2[illegible]
LAND USE SERVICES DEPT.

DATE: **JANUARY 24, 2008**

FROM: **KATHLEEN ROLLINGS-McDONALD, Executive Officer**

TO: **MATTHEW SLOWIK, Senior Planner**
Advance Planning Division – Land Use Services Department

SUBJECT: **WATER SERVICE TO TENTATIVE TRACT 16136; MOONCAMP RESIDENTIAL SUBDIVISION**

In response to your memorandum, dated January 15, 2008, I would like to provide a description of the three options for water service to this tract and the implications of Government Code Section 56133 to them from the LAFCO staff perspective.

First, Option #1, as previously identified to LAFCO staff, would be for the City of Big Bear Lake Department of Water and Power (hereafter DWP) to extend its infrastructure to serve the entirety of the residential subdivision. As I understand it, a portion of the tract is within the boundaries of the former SoCal Water Company which was condemned and acquired by the City of Big Lake and now operates under the DWP. Pursuant to the provisions of Government Code Section 56133 and LAFCO policies, the DWP has been authorized to continue to expand its services within the former boundaries of the SoCal system without the need for review and approval of LAFCO pursuant to Govt. Code Section 56133, but not beyond. Therefore, a review of the current project with our Special Counsel indicated that Option #1, to extend services by the DWP, was not viable since it would require consideration under §56133 which precludes service outside an agency's sphere of influence. None of the Fawnskin community is within the City of Big Bear Lake sphere of influence.

Please note that there is an area outside the existing DWP boundary defined as the former certificated service area of the SoCal Water Company that is receiving water service from DWP. The agreement between the DWP and Big

Bear Shores Homeowners Association was entered into in 1993, prior to the 1994 enactment of §56133. A copy of this agreement is included as an attachment to this memorandum.

Option #2, as presented to LAFCO staff, was the creation of a Joint Powers Authority (JPA) between the City of Big Bear Lake and County Service Area 53 Improvement Zone C (hereafter CSA 53C) to provide for domestic water service to the area outside the DWP system. CSA 53C was created with water powers to encompass the whole of the North Shore of Big Bear Lake including the entirety of the community of Fawnskin. This option is viable for the provision of domestic water service should it be the choice of the developers of the project.

Option #3, identified by LAFCO staff, would be for CSA 53C to own and/or install the domestic water system required by the project including development of wells and infrastructure and contract with the DWP to operate the system. CSA 53C, as noted above, includes the whole of the Fawnskin community, including areas inside and outside the service area of DWP, and is authorized water service as its only function. In the LAFCO staff view, such a management contract would be exempt from review by LAFCO under provisions of Government Code Section 56133 Subsection (e) which reads as follows:

> *"(e) This section does not apply to contracts or agreements solely involving two or more public agencies where the public service to be provided is an alternative to, or substitute for, public services already being provided by an existing public service provider and where the level of service to be provided is consistent with the level of service contemplated by the existing service provider..."*

The determination of exemption is made by the Commission following the receipt of a written request for consideration. The request shall include a copy of the contract for service, a map delineating the area to be served and a description of the manner in which the service is to be provided. Precedent for this procedure includes the contracts for service between the County (for law enforcement) and County Service Area 38 (Fire protection) and the City of Redlands related to service delivery to the "Donut Hole". A copy of these exemptions is included as an attachment to this memorandum.

Please contact me if you have any questions at (909) 383-9900.

/KRM

Attachments (3)

HARICH ENTERPRISES INC

Michael Perry
California Collaborative Solutions
P.O. Box 706
Big Bear City, Ca 92314

February 12, 2009

RE: Driller's Report and Pump Test for Moon Camp Well FP4

Dear Mr. Perry:

Enclosed please find the Well Completion Report and the results of the 48 hour constant rate pumping test for your Moon Camp Well FP4.

Harich Enterprises drilled Well FP4 at a 12" diameter to a total depth of 240 feet, with the screened interval from 100 to 240 feet and a 60' sanitary seal. Well FP4 is permitted through the County of San Bernardino as a municipal well. The well screen is a 6" diameter Roscoe Moss "Ful-Flo Louver" steel pipe. An Aquarium Sand filter pack was installed per the Special Districts Department specifications.

Static water level in the well was 22 feet measured on 2/4/09. The well was pumped at 3.4 gpm for 48 hours with the drawdown stabilizing at 87 feet (see enclosed Constant Rate Test Drawdown Chart).

Well FP4 was drilled in the northwest corner of the Moon Camp Tract as shown on the enclosed map.

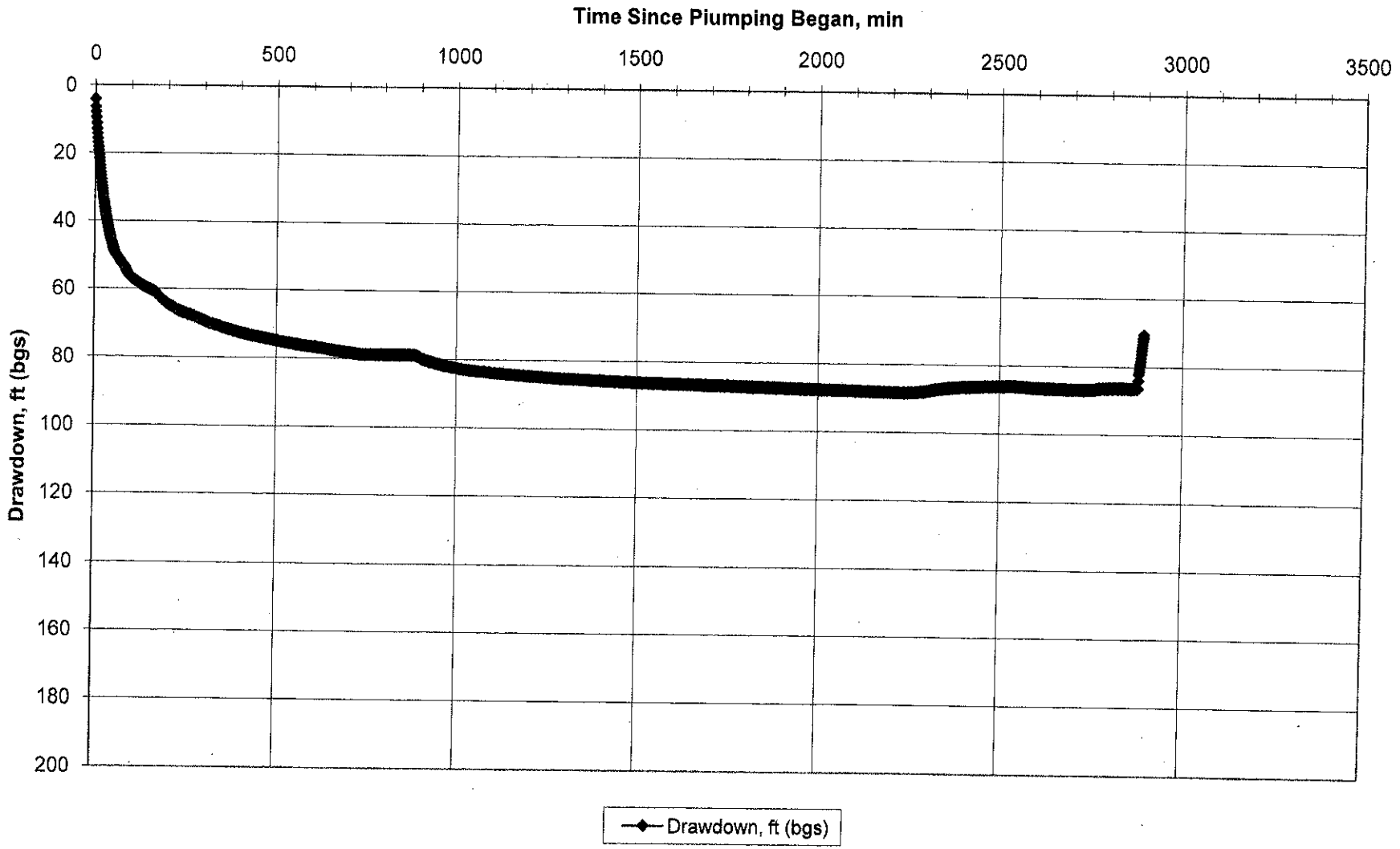
Please call me if you need any additional information.

Sincerely,

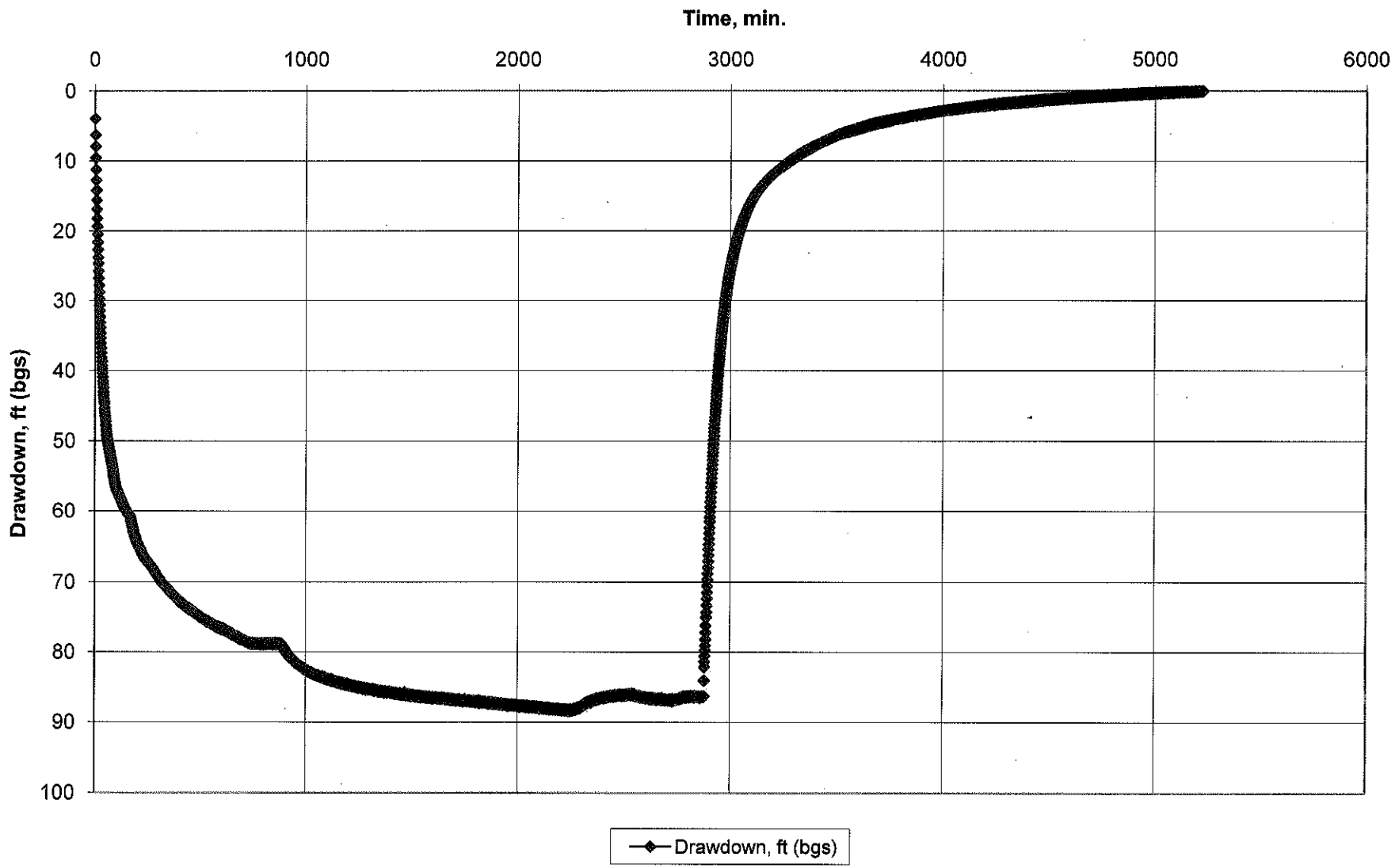
David Harich
Harich Enterprises Inc.

WATER RESOURCES DEVELOPMENT
POST OFFICE BOX 2233 RUNNING SPRINGS, CA. 92382
FAX (909)867-7759 / OFFICE (909) 867-2483

Constant Rate Test Moon Camp Well FP4
Constant Flow Rate at 3.4 GPM



Moon Camp Well FP4 Constant Rate Test at 3.4 GPM



TRIPLICATE
Owner's Copy

Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. e0085096

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. WELL FP4
Date Work Began 12/17/2009 Ended 2/6/2009
Local Permit Agency SAN BERNARDINO
Permit No. 2008100582 Permit Date 9/26/2008

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID AIR

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0 10	BROWN/RED/COBBLES/CLAY
10 20	BROWN/CLAY
20 40	BROWN/CLAY/GRAVELS
40 75	BROWN CLAY/PINK QUARTZITE
75 85	TAN/SANDS/GRAVELS/COBBLES/ 1st WATER
85 110	TAN/PINK/BLACK/COBBLES/SAND
110 120	BROWN/CLAY/GRAVELS
120 140	TAN/SAND (ADDITIONAL WATER)
140 150	TAN/GREY/BROKEN GRANITE(SMALL WATER)
150 240	GREY/SOLID GRANITE

TOTAL DEPTH OF BORING 240 (Feet)
TOTAL DEPTH OF COMPLETED WELL 240 (Feet)

WELL OWNER

Name TIM WOOD MOON CAMP
Mailing Address P.O. BOX 6820
CITY BIG BEAR LAKE STATE CA ZIP 92315

WELL LOCATION

Address HWY 18 & CANYON RD.
City FAWNSKIN, CA CA 92333
County SAN BERNARDINO
APN Book 0304 Page 091 Parcel 22
Township 2 N Range 1 W Section 13
Latitude 34 DEG. 15 MIN. 56 SEC. N
116 DEG. 56 MIN. 15 SEC. W

LOCATION SKETCH
NORTH
WEST
EAST
SOUTH
See Attached
Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)
✓ NEW WELL
MODIFICATION/REPAIR
Deepen
Other (Specify)
DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USES (✓)
WATER SUPPLY
— Domestic ✓ Public
— Irrigation — Industrial
MONITORING
TEST WELL
CATHODIC PROTECTION
HEAT EXCHANGE
DIRECT PUSH
INJECTION
VAPOR EXTRACTION
SPARGING
REMEDIATION
OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 80 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 22 (Ft.) & DATE MEASURED 2/4/2009
ESTIMATED YIELD 3.4 (GPM) & TEST TYPE PUMP
TEST LENGTH 48 (Hrs.) TOTAL DRAWDOWN 87 (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 60	12"			✓		STEEL	6"	.188	
60 100	12"				✓	STEEL	6"	.188	
100 240	12"		✓			STEEL	6"	.188	.093
						(Roscoe Mo	Ful-flo	Louvered	Pipe)

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 60	✓			
60 240				AQUARIUM SAND

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME HARICH ENTERPRISES, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS P.O. BOX 2233
CITY RUNNING SPRING STATE CA ZIP 92382
Signed
WELL DRILLER/AUTHORIZED REPRESENTATIVE
DATE SIGNED 02/10/09
C-57 LICENSE NUMBER 616447

DWR 188 REV 11-97
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

California Collaborative Solutions
Results of Rehabilitation and Aquifer Testing
Moon Camp Well FP-2

August 7, 2008

GEOSCIENCE Support Services, Inc.
P.O. Box 220, Claremont, CA 91711
Tel: (909) 920-0707 Fax: (909) 920-0403
email: email@geoscience-water.com

THIS REPORT IS RENDERED TO CALIFORNIA COLLABORATIVE SOLUTIONS AS OF THE DATE HEREOF, SOLELY FOR THEIR BENEFIT IN CONNECTION WITH ITS STATED PURPOSE AND MAY NOT BE RELIED ON BY ANY OTHER PERSON OR ENTITY OR BY THEM IN ANY OTHER CONTEXT. ALL CALCULATIONS WERE PERFORMED USING ACCEPTED PROFESSIONAL STANDARDS.

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CALIFORNIA COLLABORATIVE SOLUTIONS
RESULTS OF REHABILITATION AND AQUIFER TESTING
MOON CAMP WELL FP-2

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CALIFORNIA COLLABORATIVE SOLUTIONS
RESULTS OF REHABILITATION AND AQUIFER TESTING
MOON CAMP WELL FP-2

1.0 INTRODUCTION

This report summarizes the results of rehabilitation and testing of Well FP-2, located in the vicinity of the proposed Moon Camp development, east of Fawnskin, California (see Figures 1 and 2). Well FP-2 is a potential water source for the development, however, prior to recent activities, it had not been pumped since its construction in 1987. In order to assess the suitability of the well for water supply, GEOSCIENCE developed and implemented a well rehabilitation and testing program.

1.1 Purpose and Scope

The purpose of rehabilitation and testing of Moon Camp Well FP-2 was to:

1) Assess the current condition of the well;

2) Develop a rehabilitation program adequate to restore the specific capacity of the well so that its potential yield and water quality could be evaluated;

3) Implement the rehabilitation and testing program; and

4) Collect and analyze the data necessary for evaluating aquifer characteristics including water quality, potential interference to nearby wells, and possible hydraulic continuity with Big Bear Lake.

The scope of work to address the objectives included:

1) Conducting a downhole video survey of the well;

2) Developing a rehabilitation and testing program and coordinating implementation of the program with a rehabilitation contractor;

3) Implementing the rehabilitation program;

4) Conducting a 72-hour aquifer pumping test;

5) Collecting ground water quality samples from the well and having them analyzed for full Title 22 suite and microscopic particulate analysis (MPA); and

6) Analysis of the data and preparation of the report.

1.2 Background

The Moon Camp Well FP-2 was drilled in 1987 by Howard Pump Company of Barstow, California, using the mud rotary drilling method. A 17-inch borehole was drilled to a depth of 50 ft below ground surface (bgs), below which a 15-inch borehole was drilled to the total depth of 385 ft bgs. Well casing and screen, consisting of 8 1/8-inch inside diameter (ID) mild steel with a 1/4-inch wall thickness was installed to a total depth of 380 ft bgs. The screened portion of the well consists of Johnson Hi-Cap, a type of wire-wrap, located at depths of 60 to 120, 156 to 176, 216 to 278, and 310 to 370 ft bgs. The well was equipped with a 2-inch sounding tube that attaches to the well casing just below the ground surface. The well was filter packed using an 8 x 16 Monterey Sand from the total borehole depth to 53 ft bgs. A 2-foot bentonite layer was placed above the filter pack from 51 to 53 ft bgs and a cement annular seal was placed above the bentonite layer from 51 ft bgs to the ground surface.

Following well construction, the well was developed by bailing and pumping. Following development, an 8-hour variable rate (step drawdown) test was performed. During this test, a maximum discharge rate of 100 gallons per minute (gpm) was achieved with a pumping water level of 26 ft bgs. The specific capacity calculated from data collected during this test was approximately 5 gpm per foot of drawdown.

2.0 DOWNHOLE VIDEO SURVEY

On May 2, 2008, Pacific Surveys, LLC, conducted a downhole video survey of Well FP-2. GEOSCIENCE personnel were on site to note observations made during the survey and to direct the operation of the camera as necessary.

At the time of the video survey, the depth to static ground water level was approximately 2 ft bgs. The camera reached a depth of approximately 376 ft bgs before visibility within the water column became so reduced (i.e. blackout conditions) as to warrant the removal of the camera.

The video survey showed that the blank well casing and screen was locally scaled and corroded although no obvious structural damage was observed. The blank well casing was coated with moderate to heavy scale, with encrustants occurring in localized patches, particularly along welded casing joints. Large mounds of encrustants became more frequent and larger with depth. The wire-wrapped screen sections showed minor to complete clogging with some localized patches of encrustants and tubercles. Where screens were open, no filter pack could be seen through the screen apertures. Some of the encrusting material was observed to be relatively fragile and brittle and became dislodged from contact with the video camera.

3.0 WELL REHABILITATION PROCEDURE

Based on review of the video log, GEOSCIENCE developed a chemical and mechanical rehabilitation program for Well FP-2[1]. Rehabilitation was performed by Roadrunner Drilling & Pump Company of Winnemucca, Nevada (Contractor). The rehabilitation program was initiated on June 27, 2008.

Initial rehabilitation of Well FP-2 included mechanical dislodging of encrusted material throughout the wetted portion of the well casing and screen using a spirally-wound nylon brush. Scale and debris were dislodged by gently raising and lowering the brush throughout the specified area. The Contractor brushed each wetted foot of blank well casing for one minute and each wetted foot of screen for two minutes, for a total of 10 hours brushing time. Following brushing, a bailer was used to remove material that had accumulated at the bottom of the well.

The well was disinfected through a combination of acidification and chlorination. Using a tremie pipe, acid was introduced throughout the length of the well. The acid was mixed into the screened portion by gently lifting and lowering a bailer tool. Once the pH of the well water had been lowered to approximately 4.5 pH units, a chlorine solution was added through the tremie pipe and worked into the screened portion of the well by lifting and lowering the bailer. Once the chlorine concentration of the water in the well exceeded 200 milligrams per liter (mg/L), the well was allowed to sit idle for 24 hours.

Following chlorination, the Contractor continued rehabilitation of Well FP-2 using a combination swab and airlift tool. Swabbing was accomplished by gently lifting and lowering the double-packer tool opposite 10-foot sections of the well screen, effectively dislodging any remaining biofilm and/or fine-grained sediment from the gravel pack and near well zone. Following several passes with the swab tool through a 10-foot screened interval, the interval was

[1] Letter to Michael Perry dated May 9, 2008

pumped (air lifted) using the tool until the discharged water was clear and free of sediment. The screened portion of the well was swabbed and airlifted for a total of 20 hours.

Following swabbing and airlifting, a submersible test pump was installed within the well for final development and testing. The test pump intake was installed at a depth of approximately 130 ft bgs. Initial pumping was performed at a relatively low flow rate (approximately 30 gpm) and was gradually increased as water clarity improved and sand production decreased. Pumping was periodically interrupted to surge the well, a process where water in the pump column is allowed to flow back into the screened section of the well. This process was repeated until the discharge water was clear and the sand content was less than 0.1 parts per million (ppm). The well was developed by pumping for approximately 11 hours. The maximum discharge rate during development was approximately 150 gpm with approximately 25 feet of drawdown.

4.0 AQUIFER PUMPING TEST

A 72-hour variable rate (step-drawdown) pumping test was conducted at Well FP-2 during the period from July 1 to 4, 2008. The well was pumped in 24-hour "steps" at average discharge rates of 35 gpm, 60 gpm and 105 gpm (see Figure 3). During the pumping test, the pumping water level, discharge rate, and sand content were closely monitored (see Appendix A). Ground water levels in a nearby private well, referred to as the Fujimoto Well (see Figure 2), were also monitored during the pumping test. The pumping test was followed by 4 hours of recovery measurements in both the pumping well and the observation well. The field procedure for the pumping test followed the American Society for Testing and Materials (ASTM, 1994), Standard Test Method D4050.

4.1 Pumping Test Methodology

4.1.1 Basic Assumptions Used in Analysis of Pumping Test Data

The purpose of a pumping test is to obtain field data, which when substituted into an equation or set of equations, will yield estimates of well and aquifer properties. As certain assumptions have been used to derive these equations, it is important to consider or control these factors during the test. These assumptions are:

- The aquifer material is assumed to consist of porous media, with flow velocities being laminar and obeying Darcy's law.
- The aquifer is considered to be homogeneous, isotropic, of infinite aerial extent, and of constant thickness throughout.
- Water is released from (or added to) internal aquifer storage instantaneously upon change in water level.

- No storage occurs in the semi-confining layers of leaky aquifers.
- The storage in the well is negligible.
- The pumping well penetrates the entire aquifer and receives water from the entire thickness by horizontal flow.
- The slope of the water table or piezometric surface is assumed to be flat during the test with no natural (or other) recharge occurring, which would affect test results.
- The pumping rate is assumed constant during the entire time period of pumping during a constant-rate test, and constant during each discharge step in a variable-rate test.

4.1.2 Theis Equation

Estimation of aquifer parameters from pumping test data is based on analytical solutions of the basic differential equation of ground water flow that can be derived from fundamental laws of physics. One of the most widely used solutions of this equation for non-steady radial flow to wells is the "Theis Equation":

$$s(r,t) = \frac{114.6Q}{T} W(u) \qquad \text{"Theis Equation"} \qquad (1)$$

where:

s(r,t) = Drawdown in the vicinity of an artesian well, [ft]
r = Distance from pumping well, [ft]
Q = Discharge rate of pumping well, [gpm]
T = Transmissivity of aquifer, [gpd/ft]
W(u) = "Well function of Theis"

$$u = \frac{1.87r^2S}{Tt}$$

where:

S = Storativity, [fraction]

t = Time after pumping started, [days]

4.1.3 Jacob's Straight-Line (Modified Theis Non-Equilibrium) Method

According to Jacob (1950), for small values of "u" ($u < 0.05$), the Theis equation may be approximated by Jacob's equation:

$$s(r,t) = \frac{264Q}{T}\log\left(\frac{0.3\,Tt}{r^2 S}\right) \qquad \text{"Jacob's Equation"} \qquad (2)$$

Jacob's equation is valid for use for most hydrogeologic problems of practical interest, is easier to use than the Theis equation, and involves a simple graphical procedure to estimate transmissivity and storativity. This method (D 4105) is summarized by ASTM (1994).

Transmissivity (T, in gpd/ft) can be estimated as:

$$T = \frac{264Q}{\Delta s} \qquad (3)$$

where:

Q = Pumping rate, [gpm]

Δs = Change in drawdown over one log cycle of time, [ft]

4.2 Pumping Well

Well FP-2 served as the pumping well for the 72-hour constant rate pumping test. The static ground water level in the well was measured to be approximately 6 ft bgs prior to the start of pumping. Ground water levels were measured during the pumping test and recovery phase using a downhole pressure transducer programmed to collect measurements at one-minute intervals. Additionally, an electric wireline sounder was used to manually collect ground water levels in FP-2 during the pumping and recovery phases.

The discharge rate was monitored with a flowmeter equipped with a totalizer and instantaneous rate gauge. During the course of the 72-hour pumping test, Well FP-2 pumped at average discharge rates of 35, 60, and 105 gpm (Steps 1, 2, and 3, respectively). The total volume of ground water pumped during testing was 289,350 gallons.

Ground water samples were collected during the 72-hour step test after approximately 44 hours of pumping (July 2, 2008). The samples were submitted to E.S. Babcock & Sons, Inc. of Riverside, California for analysis of constituents required by the State of California Code of Regulations Title 22 Rule as well as other selected constituents. A complete list of the constituents tested and their detection limits are provided in Table 1. Laboratory results of the water quality testing are presented in Appendix B.

A microscopic particulate analysis (MPA) was performed during the first 24 hours of the step drawdown test. After approximately 1,000 gallons of discharge water were run through a filtering apparatus, the filter was submitted to BioVir laboratories, Inc. of Benicia, California. The sample was analyzed according to EPA Method 910/9-92-029 including *Giardia* species and *Cryptosporidium*. Results of the MPA are presented in Appendix C.

4.3 Observation Well

Ground water levels were monitored before, during and after the pumping test in an observation well (a private well referred to as the Fujimoto Well) located approximately 910 ft east of Well FP-2. Water level measurements were collected and recorded in this well using a pressure transducer.

5.0 PUMPING TEST RESULTS

5.1 Production Well (FP-2)

As shown on Figure 3, Well FP-2 can be pumped at a rate of 35 gpm on a long-term basis with less than 10 ft of drawdown in the well. The well can also sustain a pumping rate of 105 gpm on a long-term basis although the rate of ground water level decline is greater. Analysis of the 105 gpm step using Jacob's straight-line interpretation shows an aquifer transmissivity of approximately 14,600 gallons per day per foot of drawdown (gpd/ft; see Figure 4). At a pumping rate of 105 gpm, the specific capacity of FP-2 is approximately 4.7 gpm/ft.

The specific capacity (the inverse of specific drawdown), of the well during Step 1 was less than the specific capacity measured during Steps 2 and 3. This results in a negative trendline when plotting specific drawdown with discharge rate, and thus, well efficiency cannot be calculated (see Figure 5).

Calculated recovery is a method of analysis whereby extrapolated drawdown data is compared to actual recovery data from the pumping well. It can be used to calculate transmissivity using Jacob's straight line interpretation in a similar manner as used with the pumping drawdown data. Results of the calculated recovery analysis for well FP-2 shows an aquifer transmissivity of approximately 8,900 gpd/ft (see Figure 6). Residual drawdown analysis, a method whereby residual drawdown (the difference between the static and recovering water level) is plotted with respect to the ratio between the time since pumping stopped and the time since pumping started, can also be used for calculating aquifer transmissivity using Jacob's straight line interpretation. Results of the residual drawdown analysis for Well FP-2 shows an aquifer transmissivity of approximately 9,600 gpd/ft (see Figure 7).

5.2 Observation Well

Ground water level data collected from the observation (Fujimoto) well, located approximately 910 ft east of Well FP-2, during the pumping test shows minor ground water pumping interference that can be attributed to pumping of Well FP-2. Given that the Fujimoto well was an actively pumping well that cycled on and off periodically during the pumping test, it was necessary to interpret pumping interference from Well FP-2 through the ground water level "noise" of the pumping observation well. To account for this, static ground water levels were used to interpret interference trends (see Figure 8). Interpretation of static ground water trends during the pumping test shows a decline of approximately 0.3 ft that can be attributed to interference from pumping Well FP-2 at a rate of 35 gpm.

5.3 Ground Water Quality

Ground water quality data from Well FP-2 indicate that water produced from the well is suitable for municipal supply. The water is of calcium-bicarbonate type (see Figure 9). The total dissolved solids (TDS) concentration was reported to be 300 mg/L, below the recommended California Department of Public Health (CDPH) secondary maximum contaminant level (MCL) of 500 mg/L. Toluene was detected at a concentration of 1.2 micrograms per liter (µg/L), below the CDPH primary MCL of 150 µg/L, and is likely from materials used during installation of the test pump. Chloroform was detected at a concentration of 0.98 µg/L, below the USEPA MCL of 80 µg/L for trihalomethanes, and is likely a by-product of the chlorine used during rehabilitation of the well casing and screen. All other detected constituents were below their respective MCLs or notification levels.

The results of the water quality analyses are summarized in the following table:

Water Quality Analytical Data – Moon Camp Well FP-2

		Analysis Result	Drinking Water Regulatory Standards
Aluminum	**[µg/L]**	< 50	200[2]/1,000[1]
Arsenic	**[µg/L]**	< 2.0	10[1]
Boron	**[µg/L]**	< 100	1,000[3]
Chloride	**[mg/L]**	2.7	250-500[2]
Chromium, Hexavalent	**[µg/L]**	< 1.0	50[1,4]
Chromium, Total	**[µg/L]**	1.1	50[1]
Color	**[Color Units]**	< 3.0	15[2]
Fluoride	**[mg/L]**	< 1.0	2.0[1]
Iron	**[µg/L]**	< 100	300[2]
Manganese	**[µg/L]**	< 20	50[2]
Nitrate (as NO_3)	**[mg/L]**	< 1.0	45[1]
Odor	**[TON]**	< 1.0	3[2]
Perchlorate	**[µg/L]**	< 4.0	6.0[1]
pH	**[pH Units]**	7.5	6.5 - 8.5[5]
Silica, Total	**[mg/L]**	25	NA[6]
Specific Conductance	**[µmhos/cm]**	510	900-1,600[2]
Sulfate (as SO_4)	**[mg/L]**	5.2	250-500[2]
Surfactants (MBAS)	**[mg/L]**	< 0.05	0.5[2]
Total Dissolved Solids (TDS)	**[mg/L]**	300	500 - 1,000[2]
Total Hardness	**[mg/L]**	270	NA[6]
Turbidity	**[NTU]**	0.39	5[2]
Vanadium	**[µg/L]**	< 3.0	50[3]
1,2,3-Trichloropropane	**[µg/L]**	< 0.005	0.005[3]
Gross Alpha	**[pCi/L]**	1.74 +/- 1.33	15[1]
Radon	**[pCi/L]**	447 +/- 43.1	300-4,000[7]
Volatile Organic Compounds (EPA Method 524.2) except as noted below:	**[µg/L]**	ND	Varies with Chemical[1]
Chloroform	**[µg/L]**	0.98	80[8]
Toluene	**[µg/L]**	1.2	150[1]

1 California Department of Public Health (CDPH) primary maximum contaminant level (MCL).
2 CDPH secondary MCL.
3 CDPH notification level for unregulated chemicals.
4 Chromium-6 (hexavalent chromium) is regulated by CDPH under the 50 µg/L total chromium MCL.
5 United States Environmental Protection Agency (USEPA) secondary standard for pH.
6 Not Applicable – no current MCL.
7 USEPA proposed MCL and alternative MCL.
8 Chloroform is regulated under the 80 µg/L USEPA MCL for total trihalomethanes.
ND Not detected above laboratory detection limit.
BOLD Equal to or above current CDPH MCL or notification level.

5.4 Microscopic Particulate Analysis

Microscopic particulate analysis (MPA) did not show any primary or secondary particulates in the well discharge, with the exception of plant pollen. The plant pollen identified was determined to be pine pollen, and is likely an airborne contaminant that contacted the sampling apparatus during field set-up. Given this, there is no evidence from the MPA that the ground water produced by Well FP-2 is under the direct influence of surface water in Big Bear Lake. A copy of the complete MPA report is presented in Appendix C.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the data collected during this investigation, we have developed the following conclusions:

- Well FP-2 has successfully been rehabilitated and its specific capacity restored to near original levels;
- Extreme care should be exercised when equipping or redeveloping the well in the future to avoid damaging the wire-wrap screen. Although no clear damage was visible from the video survey, the screen design is fragile and can easily be damaged;
- Well FP-2 can yield up to 35 gpm on a long-term basis with less than 10 ft of drawdown;
- At the 35 gpm discharge rate, pumping interference with the closest private well is expected to be less than 0.3 ft;
- Ground water quality data from Well FP-2 indicates the water from the well is suitable for municipal supply;
- Microscopic particulate analysis of discharge water detected pine pollen on the sampling filter. However, the detection was likely the result of an airborne contaminant and not from ground water under the direct influence of surface water. Confirmation sampling and analysis may be necessary to verify this conclusion prior to permitting the well with the CDPH.

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Driscoll, Fletcher G., 1986. Groundwater and Wells. Second Edition. U.S. Filter/Johnson Screens, St Paul Minnesota.

G.5 - Recommendations for Ground Water Monitoring in the Mooncamp Development Area. (GEOSCIENCE, September 2004

GEOSCIENCE

September 2, 2004

Mr. Jerry Gruber
General Manager
City of Big Bear Lake Department of Water and Power
41972 Garstin Drive
P.O. Box 1929
Big Bear Lake, CA 92315

Subject: **Recommendations for Ground Water Monitoring and Management in the Moon Camp Development Area**

Dear Jerry:

As a follow-up to our 30-Jul-04 meeting at the County of San Bernardino regarding the proposed Moon Camp development near Fawnskin, this letter outlines a process to establish a monitoring well and develop a ground water monitoring and management plan (GWMP) specific to the tributary subarea within which the proposed development would be located. The maximum perennial yield of the tributary subarea surrounding the proposed development has been estimated to range from 14 to 44 acre-ft/yr. However, the relatively wide range of potential yield reflects the limited data available to determine the estimate. At the 30-Jul-04 meeting, the County of San Bernardino indicated they would not permit a project with a water supply requirement that exceeded the low end of the maximum perennial yield estimate until it could be demonstrated, with additional data, that the yield was indeed higher.

To refine the maximum perennial yield estimate and, perhaps more importantly, provide a basis for managing the ground water resources within the tributary subunit encompassing the proposed development, it is recommended to establish one or more monitoring wells (i.e. wells that are not pumped) in this area to enable the collection of ground water level data. Monitoring wells could consist of existing wells in the area or newly constructed wells. Future monitoring wells should be drilled and completed to the bedrock surface. The wells should be at least 4 inches in diameter (to allow for the collection of future water quality samples) and can be constructed of

GEOSCIENCE SUPPORT SERVICES INCORPORATED
Ground Water Resources Development
P.O. Box 220, Claremont, CA 91711
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909-920-0707

Schedule 40 PVC or mild steel casing and screen. The perforated intervals of the wells should be similar to those of nearby production wells.

The monitoring wells for the tributary subarea around the Moon Camp Development would be incorporated into the existing City of Big Bear Lake Department of Water and Power GWMP, which outlines a standard methodology for the collection of ground water data for the purpose of facilitating ground water management decisions. The types of data to be collected from the monitoring wells in accordance with the GWMP would include ground water levels and ground water quality. At least one of the monitoring wells should be established as a "key" monitoring well, in which a ground water level thresholds are identified to guide decision-making.

The location of monitoring wells will depend on the suitability of the existing U.S. Forest Service wells for production. It is planned to evaluate these wells in the near future. Using the information obtained from this evaluation, existing and/or proposed future monitoring wells will be identified.

If you have any questions, please call.

Sincerely,

Dennis E. Williams, Ph.D
President

A.3 - 2011 Revised and Recirculated Draft EIR No. 2 and Appendices

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Revised and Recirculated
Draft Environmental Impact Report No. 2
Moon Camp 50-lot Residential Subdivision, TT No. 16136
(Based on the Revised Site Plan)
Big Bear Lake, San Bernardino County, California
SCH No. 2002021105

Prepared for:

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Revised: November 9, 2011

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A.4 - Southwestern Willow Flycatcher Focused Survey Report (Michael Brandman Associates, August 2007)
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EXECUTIVE SUMMARY

Purpose and Use of this Revised and Recirculated Draft EIR No. 2

Background and History

Three separate public circulations of the Draft Environmental Impact Report (EIR) for this project have occurred since 2004 (including this 2011 Recirculation). In order to provide context for this current recirculation of limited portions of the EIR, a description of project evolution and environmental review process is provided below.

Original Project - 2004

In 2004, the County circulated a Draft EIR evaluating the Original Project - a 92-lot residential subdivision on 62.43 acres with a minimum lot size of 7,200 square feet. Significant adverse and unavoidable impacts resulting from development of the Original Project included Aesthetics (loss of views of the lake and surrounding mountains due to the development of the 31 lakefront lots), Air Quality (short-term during construction and long-term), Biological Resources (noise and perch tree impacts on the bald eagle), and Water Supply (inconclusive groundwater supply). Partially in response to public comments received on the Original Project-2004 and accompanying EIR, the Applicant revised the tentative tract map (see discussion of Alternative Project 2010, below) to avoid or substantially reduce the identified significant impacts. Although numerous comments were received on the 2004 Draft EIR, the County did not prepare a Response to Comments/Final EIR document and the Project was not considered for approval at a public hearing.

Alternative Project - 2010

Partially in response to comments received on the 2004 Draft EIR, the Applicant proposed an alternative to the Original Project - 2004 that substantially reduced and in some cases completely avoided the significant environmental impacts that were identified in the 2004 EIR. The revised project design/description (2010 Alternative Project) reduced the number of residential lots from 92 to 50 and also seven lettered lots. The residential lots would have a minimum lot size of 20,000 square feet and be sold individually and developed into individual custom homes. In addition, the 2010 Alternative project eliminated realignment of SR-38 and eliminated all lakefront residential lots. All 50 residential lots would be located to the north of SR-38. Of the seven lettered lots, one would be designated Open Space/Conservation (4.91 acres), one would be designated as Open Space/Neighborhood Lake Access (0.82 acre with 891 lineal feet of lakefront access), one would be developed as the marina parking lot for a 55-slip private boat marina (2.90 acres), three include the existing well sites, and the final lettered lot is a potential reservoir site. The marina parking lot is designed for the preservation of existing trees and eagle perch trees; however, because of the development of the parking lot, the lot would not be considered Open Space. A 10-acre off-site pebble plain habitat will also be purchased and preserved in perpetuity through a Conservation Easement.

In response to the development of the 2010 Alternative Project, the County prepared revisions to the 2004 EIR. (Revised and Recirculated Draft EIR No. 1) The following sections were revised:

1. **Aesthetics** - views of the site from adjacent residential uses and the state highway, and from the lake.
2. **Air Quality** - update air quality analysis to include consistency with 2007 Air Quality Management Plan (AQMP) and to address global climate change.
3. **Biological Resources** - conduct new surveys for sensitive species and to assess the pebble plain habitat on-site.
4. **Hydrology and Water Quality** - address potential water quality impacts to Big Bear Lake from runoff from the site.
5. **Land Use and Planning** - evaluate the 2010 Alternative Project using the 2007 General Plan and Development Code.
6. **Noise** - address construction noise and long-term residential noise from the 2010 Alternative Project site.
7. **Public Services and Utilities** - address emergency evacuation of the site, provide an analysis of water supply and wastewater treatment.
8. **Traffic and Circulation** - update the traffic study to address revisions to the 2010 Alternative Project's circulation plan and to capture the most recent cumulative projects in the vicinity.
9. **Cumulative Impacts** - evaluate potential environmental effects of the 2010 Alternative Project, in conjunction with other proposed or recently approved projects in the vicinity that together could result in significant and unavoidable cumulative impacts.
10. **Alternatives** - evaluate the 2010 Alternative Project, comparing the potential environmental effects to the Original Project-2004 and other alternatives identified in the 2005 Final EIR.

The Revised and Recirculated Draft EIR No. 1 also included certain updated technical reports analyzing the impacts of the 2010 Alternative Project. These reports included an updated Traffic analysis, Biological Resources analysis, Hydrology and Water Supply analysis and Noise analysis. The Revised and Recirculated Draft EIR No. 1 was circulated for public review from April 5, 2010 to June 3, 2010. The County received 109 comments on the Revised and Recirculated Draft EIR No. 1.

Significant Impacts that Cannot Be Mitigated

The Revised and Recirculated Draft EIR No. 1 concluded that the 2010 Alternative Project would have significant and unavoidable impacts related to Biological Resources. The unavoidable impacts were to the bald eagle. No additional significant impacts related to the 2010 Alternative Project were identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino. See Table ES-4 within the Revised and Recirculated Draft EIR No. 1 for the 2010 Alternative Project mitigation measures and impacts.

2011 Alternative Project

Based on concerns raised in comments received on the Revised and Recirculated Draft EIR No. 1, a Supplemental Focused Special Status Plant Species Survey, dated August 2010, was conducted to confirm the conclusion in the Revised and Recirculated Draft EIR No. 1 that impacts to the Ashy-Gray Indian Paintbrush (a Federally-Listed Threatened Species) are less than significant. The survey analyzed the density of Ashy-Gray Indian Paintbrush within the Project site and whether project implementation would result in potential off-site impacts on the U.S. Forest Service pebble plain habitat near the northeast portion of the Project site. The Supplemental Focused Special Status Plant Species Survey (August 29, 2010) showed the presence of high densities of Ashy-Gray Indian Paintbrush plants on the western most Lots (Lots 1, 2 and 3) in the area west of "Street A"—the public roadway through the Project site.

In addition, the Supplemental Focused Special Status Plant Species Survey (August 29, 2010) determined that the area thought to be pebble plain habitat located within Lot A (as identified within the Supplemental Special Status Plant Species Survey, 2008), is not a true pebble plain habitat due to the lack of two key indicator species (*Arenaria ursina* and *Eriogonum kennedyi austromontanum).* The Supplemental Focused Special Status Plant Species Survey (August 29, 2010) findings augment the Supplemental Focused Special Status Plant Species Survey conducted by Dr. Krantz, dated June 29, 2008, providing an above-average precipitation year for observation.

Based on the new finding regarding the presence of high densities of Ashy-Gray Indian Paintbrush in areas occupied by significant Ashy-Gray Indian Paintbrush occurrences, the applicant redesigned the subdivision layout to minimize impacts to this species. The redesigned subdivision, which is depicted in Exhibit 1-4 (see Section 1, Project Description, for Exhibit 1-4) creates a new Lot "H" Open Space Conservation Easement over the area with the highest concentration of plants (Lots 1-3), with three replacement residential lots proposed to be created along the south side of Street "A", an area with significantly lower concentrations of Ashy-Gray Indian Paintbrush.

The redesign of the subdivision and the conclusions of the Supplemental Focused Special Status Plant Species Survey (August 29, 2010) revealing the presence of high densities of Ashy-Gray Indian Paintbrush on Lots 1-3 of the Project site constitutes "significant new information" as defined by Section 15088.5 of the CEQA Guidelines, and therefore requires a partial recirculation of the Revised and Recirculated Draft EIR No. 1 to fully disclose and analyze the potential impacts of the redesigned subdivision. See Table ES-1 for a comparison of the changes in project design between the three (3) iterations of the Draft EIR.

Table ES-1: Comparison Between the Original Project, 2010 Alternative Project and the 2011 Alternative Project

Project Design	Original Project - 2004	2010 Alternative Project	2011 Alternative Project
Circulated for Public Review	Draft EIR - March 30, 2004 to May 13, 2004	Revised and Recirculated Draft EIR No. 1 - April 5, 2010 to June 3, 2010	Revised and Recirculated Draft EIR No. 2
Site Size	62.43 acres	62.43 acres	62.43 acres
Proposed General Plan Designation*	BV/RS-1 (residential-minimum 7,200 sf lots)	BV/RS-20M (residential-minimum 20,000 sf lots)	BV/RS-20M (residential-minimum 20,000 sf lots)
Number of Lots	95	57	58
Residential Lots	92	50	50
Lettered Lots	3	7	8
	Lot A – proposed private street designed to provide access to the southernmost lots (lakefront sites)	Lot A – a 4.91-acre Open Space/Conservation (OS/C) easement to preserve pebble plain habitat and eagle perch trees	Lot A – a 3.4-acre Open Space/Conservation (OS/C) easement to preserve Ashy Gray Indian Paintbrush, pebble plain soil conditions and eagle perch trees
	Lot B – a 1.4-acre strip of land between State Route 38 and the private street south of the highway	Lot B – a 0.82 acre/891 lineal feet strip of land to remain OS/C between State Route 38 and the lakefront for open space and Neighborhood Lake Access	Lot B – a 0.82 acre/891 lineal feet strip of land to remain OS/C between State Route 38 and the lakefront for open space and Neighborhood Lake Access
	Lot C – a gated entrance, south of State Route 38, a parking lot and access to the marina	Lot C – a 2.90-acre strip of land to be used as a parking lot and boat launch and open space	Lot C – a 2.90-acre strip of land to be used as a parking lot and boat launch and open space
	—	Lots D, E and F – well sites	Lots D, E and F – well sites
	—	Lot G – reservoir site	Lot G – reservoir site
	—	—	Lot H – a 1.9-acre Open Space Conservation Easement over the area with the highest concentration of Ashy-Gray Indian Paintbrush.
Common Areas	Common areas within lettered lots would be maintained by a homeowner's association	Conservation Easements would be maintained by a Conservation Group and Common areas within lettered lots would be maintained by a homeowner's association	Conservation Easements would be maintained by a Conservation Group and Common areas within lettered lots would be maintained by a homeowner's association

Table ES-1 (cont.): Comparison Between the Original Project, 2010 Alternative Project and the 2011 Alternative Project

Project Design	Original Project - 2004	2010 Alternative Project	2011 Alternative Project
Marina/Boat Dock	103 boat slips on west side of the site	55 boat slips on the east side of the site	55 boat slips on the east side of the site
Lakefront Lots	31 lakefront lots	No lakefront lots	No lakefront lots
State Route 38	Realignment of State Route 38 to provide a straighter alignment and to provided lakefront residential lots	No change in the alignment of State Route 38	No change in the alignment of State Route 38
Development Scenario	Lots would be sold individually and custom homes would be constructed by the individual property owners	Lots would be sold individually and custom homes would be constructed by the individual property owners	Lots would be sold individually and custom homes would be constructed by the individual property owners
* Current General Plan Designation is BV/RL-40 – Bear Valley Community Plan, Rural Living, minimum 40-acre residential lot size.			

Partial recirculation of this EIR for the 2011 Alternative Project will further the basic purpose of CEQA to inform decision makers and the public about the potential significant environmental effects of proposed activities.

CEQA requires the preparation of an objective, full disclosure document to inform agency decision makers and the general public of the direct and indirect environmental effects of the proposed action; provide mitigation measures to greatly reduce or eliminate significant adverse effects; and identify and evaluate reasonable project alternatives that could avoid or substantially lessen one or more of such effects to the 2011 Alternative Project. The subject of this Revised and Recirculated Draft EIR No. 2 is such a project alternative.

This Revised and Recirculated Draft EIR No. 2 evaluates the potential environmental effects of the 2011 Alternative Project to the degree of specificity appropriate to the current proposed actions, as required by Section 15146 of the State CEQA Guidelines. The sections included in the Revised and Recirculated Draft EIR No. 2 comprise the following:

Executive Summary. This section includes a summary of the revisions to the 2011 Alternative Project and alternatives addressed in the Draft EIR No. 2. Also included are descriptions of the issues to be resolved, areas of controversy and a table that summarizes the impacts, mitigation measures, and level of significance after mitigation.

Section 1: Project Description. This section includes a detailed description of the 2011 Alternative Project, including its location, site, and project characteristics. A discussion of the 2011 Alternative

Project objectives, intended uses of the Revised and Recirculated Draft EIR No. 2, responsible agencies, and approvals that are needed for the 2011 Alternative Project are also provided.

Section 2: Biological Resources. This section analyzes the potential for the 2011 Alternative Project to result in significant impacts to biological resources and discusses the conclusions and analysis included in the Supplemental Focused Special Status Plant Species Survey (August 29, 2010) prepared by Dr. Timothy Krantz..

The analysis considers the actions associated with the 2011 Alternative Project to determine the short-term and long-term effects of their implementation. This Revised and Recirculated EIR No. 2 discusses both the direct and indirect impacts of the revisions to the 2011 Alternative Project.

This Revised and Recirculated Draft EIR No. 2 will be circulated for public review for a period of 45 days. Upon completion of the public review period, comments received on this Revised and Recirculated Draft EIR No. 2 will be considered and responses will be prepared. In releasing this Revised and Recirculated Draft EIR No. 2, the County, pursuant to CEQA Guidelines § 15088.5, request that reviewers limit their comments to the revised portions of this Recirculated EIR.

The County of San Bernardino (County) has prepared this Revised and Recirculated Draft EIR No.2 to provide responsible and trustee agencies, interested parties, and the public with information about the potential environmental effects associated with the Revised Moon Camp 50-lot Residential Subdivision Project (Alternative Project - 2011) on 62.43 acres located in the Community of Fawnskin in San Bernardino County, California.

Project (2011 Alternative Project) Characteristics

The 2011 Alternative Project that is the subject of this Revised and Recirculated Draft EIR No. 2, represents very minor changes from the 2010 Alternative Project, consisting entirely of reconfiguration of residential lots and Open Space Conservation Areas. The changes are summarized below:

- Redesigned Residential Lot Layout. The 2011 Alternative Project still reflects development of 50 residential lots on approximately 62.43 acres. The 2011 Alternate Project does not increase development intensity but merely proposes a revised lot configuration. However, Lots 1-3, which were located north of Street A on the western-most portion of the Project site have been shifted east and will be located in an area previously occupied by a portion of Lot A which was designated as Open Space Conservation Easement. (Please see Exhibit 1-4).
- Creation of Open Space Lot H. To compensate for the loss of a portion of Lot A, previously designated as Open Space Conservation Easement, and in response to the Supplemental Focused Special Status Plant Species Survey (August 29, 2010) which identified significant occurrences of Ashy-Gray Indian Paintbrush in the area previously designated for

development, a 1.98 acre portion of the Project site previously occupied by Lots 1-3 will now become lettered Lot H which, like Lot A, is designated Open Space/Conservation Easement.

The revisions to the 2011 Alternative Project do not increase or alter development type or intensity but merely redistribute the developable lots in order to minimize impacts to the Federally Threatened Ashy-Gray Indian Paintbrush plant species and the discovery that the prior portion of Lot A characterized as pebble plain habitat was mischaracterized. Aside from the redesign of three developable lots and creation of an additional Open Space lettered lot, nothing about the 2011 Alternative Project changed.

Summary of this Revised and Recirculated Draft EIR No. 2

Issues Addressed in this Revised and Recirculated Draft EIR No. 2

The following issues are addressed in this Revised and Recirculated Draft EIR No. 2:

Section ES: Executive Summary. This section includes a summary of the 2011 Alternative Project and alternatives addressed in the Revised and Recirculated Draft EIR No. 2. Also included are descriptions of the issues to be resolved, areas of controversy and a table that summarizes the impacts, mitigation measures, and level of significance after mitigation.

Section 1: Project Description. This section includes a detailed description of the 2011 Alternative Project, including its location, site, and project characteristics. A discussion of the Project objectives, intended uses of the Revised and Recirculated Draft EIR No. 2, responsible agencies, and approvals that are needed for the 2011 Alternative Project is also provided.

Section 2: Biological Resources. This section analyzes new surveys for sensitive species and assesses the sensitive species habitat on-site.

Please note that sections have been modified only related to the revised biological resources and to reflect the minor changes to the site plan that have been made to accommodate the mitigation provided for the Ashy-Gray Indian Paintbrush.

Due to the limited scope of revisions to the 2010 Alternative Project, the analysis included in the original EIR, as modified by Revised and Recirculated Draft EIR No. 1, for all other impact areas is still applicable to the 2011 Alternative project and, therefore, those sections will not be recirculated.

Table ES-2, Executive Summary Matrix, provides a summary of the Alternative Project's - 2011 environmental impacts, mitigation measures and the level of significance after implementation of mitigation. This Executive Summary Matrix only addresses the Biological Resources section.

Table ES-2: Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Section 2 - Biological Resources		
Special Status Biological Resources	*Special Status Plants and Plant Communities* **MM BR-1a.** Prior to the initiation of clearing or grading activities on the Project site, a conservation easement shall be placed upon the 10-acre Dixie Lee Lane property. The conservation easement shall be in favor of a qualified conservation entity and shall be recorded in the San Bernardino County Recorder's Office. The easement shall provide for the continued protection and preservation of the property. The easement shall, at a minimum, restrict all use of the property that has the potential to impact the quality of pebble plain soils and other valuable biological habitat, including the occurrences of the Federally Threatened Ashy-Gray Indian Paintbrush. Project proponent shall also create a perpetual, non-wasting endowment for the management and preservation of the mitigation property. The management entity will be approved by the California Department of Fish and Game (CDFG). **MM BR-1b.** Prior to the initiation of clearing or grading activities on the Project site, the 5.38-acre on-site conservation easements (including Lot-A and Lot-H) shall be established. The conservation easement shall be in favor of a qualified conservation entity and shall be recorded in the San Bernardino County Recorder's Office. The easement shall provide for the continued protection and preservation of the property. The easement shall, at a minimum, restrict all use of the property that has the potential to impact the occurrences of the Federally Threatened Ashy-Gray Indian Paintbrush. Project proponent shall also create a perpetual, non-wasting endowment for the management and preservation of the mitigation property. The management entity will be approved by the California Department of Fish and Game (CDFG). **MM BR-1c.** Project Applicant shall take the following actions to further ensure the permanent preservation of the Conservation Areas (Lots A and H):	Significant and unavoidable impacts related to Biological Resources have been identified for impacts to Bald Eagle.

Table ES-1 (cont.): Comparison Between the Original Project, 2010 Alternative Project and the 2011 Alternative Project

Impacts	Mitigation Measures	Level of Significance After Mitigation
	• Restrict access by pedestrians and motor vehicles to the Conservation Areas. The Conservation Areas shall be secured through installation of fencing or other barriers to prevent access to Conservation Areas. Barriers shall be installed prior to commencement of any construction activities on site. Applicant shall also include provisions in the CC&Rs for the Project instituting penalties to residents who violate the restrictions and cause any damage to the protected plant habitat. • Include enforcement provisions in the CC&Rs allowing the Homeowners Association, individual residents within the Project and/or County of San Bernardino to enforce any violation of provisions intended for the protection of sensitive plant species located within Lot A and Lot H. • Install appropriate signage identifying Conservation Areas and the sensitive nature of such areas on the project site and that access is prohibited. • Prohibit use of invasive plant species in landscaping. Each lot owner shall be given a list of prohibited invasive plant species upon purchase of lot with the parcel. Landscape plans for individual parcels shall be approved by the County prior to development to ensure no inappropriate plant material is incorporated into the design of any individual lot or common area which may compromise the quality of the Conservation Areas. • Development may not change the natural hydrologic conditions of the Conservation Areas. All grading plans shall be reviewed by the County to ensure hydrologic conditions of the conservation lands are not adversely changed by development • Applicant or appointed conservation entity shall monitor Conservation Areas on a periodic basis to ensure invasive, non-native species are not present. All non-nature invasive plant species shall be removed from Conservation Areas.	

Table ES-1 (cont.): Comparison Between the Original Project, 2010 Alternative Project and the 2011 Alternative Project

Impacts	Mitigation Measures	Level of Significance After Mitigation
	MM BR-1d. Construction to the rear portions of Lots 47, 48, 49, and 50 shall be restricted by means of building envelopes or building setback lines to prevent construction in the occupied Ashy-Gray Paintbrush habitat, wherever feasible. *Special Status Wildlife* **MM BR-2.** Trees and downed logs shall remain in place, to the extent that clearing is not required by the development process, and a 50-foot setback (measured on each side of the centerline) must be maintained along the deepest ravine at the eastern edge of the property. This measure will serve to preserve habitat for potential special status wildlife species. **MM BR-3.** The project proponent shall have a biologist qualified with San Bernardino flying squirrel (SBFS) as a monitor during tree removal. Minimize the number of trees, snags, and downed wood removed for project implementation. Compensating the removal of snags containing cavities; this would be achieved by constructing and erecting two nest boxes and one aggregate box per snag removed. Appendix A of this Revised and Recirculated Draft EIR No. 2 provides the specifications of the nest and aggregate boxes (Flying Squirrels 2007). These boxes should be located on the adjacent U.S. Forest Service (USFS) land (with their permission) and the locations marked with a global positioning system. The locations of the boxes shall be provided to the USFS so that their biologists could monitor the boxes for occupation by SBFS. Provide new homeowners with a flyer that would provide information on the biology of SBFS and how they are susceptible to depredation by cats. The flyer would also outline steps that homeowners could take to reduce their urban edge effects. **MM BR-4.** Eagle perch trees identified in the 2002 Bonterra Consulting Bald Eagle Survey for Tentative Tract 16136, Moon Camp, Fawnskin, San Bernardino County, California, (see Appendix A of this Revised and Recirculated Draft EIR No. 2) shall be preserved in place upon project	

Table ES-1 (cont.): Comparison Between the Original Project, 2010 Alternative Project and the 2011 Alternative Project

Impacts	Mitigation Measures	Level of Significance After Mitigation
	completion. If any of the designated perch trees should become hazardous and need to be taken down, replacement will be at a 5:1 ratio with the creation of artificial perch trees along shoreline designated open space. Any development that may occur within the Project site and in the individual lots must avoid impacts to trees larger than 24 inches diameter breast height (dbh) and their root structures to the maximum extent feasible. If any additional non-perch trees on-site larger than 24 inches dbh are removed, then a replacement ratio of 2:1 shall be required and replacement trees shall be 24-inch box trees or larger. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan. **MM BR-5.** Prior to vegetation clearing, grading, or other disturbance, the Project site shall be surveyed to identify all large trees (i.e., greater than 20 inches in diameter at 4.5 feet from the ground) within 600 feet from the high water line. Trees identified on the Project site as having a diameter in excess of 20 inches at 4.5 feet from the ground within 600 feet of the shoreline shall be documented and tagged. Any development that may occur within the Project site and in the individual lots shall avoid impacts to tagged trees and their root structures. If such trees cannot be avoided, their removal shall be coordinated with the County of San Bernardino to minimize impacts to the extent feasible. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.	

Table ES-1 (cont.): Comparison Between the Original Project, 2010 Alternative Project and the 2011 Alternative Project

Impacts	Mitigation Measures	Level of Significance After Mitigation
	MM BR-6. Seven days prior to the onset of construction activities, a qualified biologist shall survey within the limits of project disturbance for the presence of any active raptor nests. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG. If nesting activity is present at any raptor nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for raptors in the region of the Project site normally occurs from February 1 to June 30. To protect any nest site, the following restrictions on construction are required between February 1 and June 30 (or until nests are no longer active as determined by a qualified biologist): (1) clearing limits shall be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying shall not be allowed within 200 feet of any occupied nest. Any encroachment into the 300/200-foot buffer area around the known nest shall only be allowed if it is determined by a qualified biologist that the proposed activity shall not disturb the nest occupants. Construction during the nesting season can occur only at the sites if a qualified biologist has determined that fledglings have left the nest. **MM BR-7.** Vegetation removal, clearing, and grading on the Project site should be performed outside of the breeding and nesting season (between February 1 and June 30), when feasible, to minimize the effects of these activities on breeding activities of migratory birds and other species. If clearing occurs during breeding season, a 30-day clearance survey for nesting birds shall be conducted. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG. If nesting activity is present at any nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code.	

Table ES-1 (cont.): Comparison Between the Original Project, 2010 Alternative Project and the 2011 Alternative Project

Impacts	Mitigation Measures	Level of Significance After Mitigation
	MM BR-8. The use of the boat dock for motorized boating shall be prohibited between the dates of December 1 and April 1. No motorized boats shall be allowed to launch or moor in the vicinity of the boat dock at any time during this period. This restriction shall be clearly displayed on signage at the entrance to the parking lot and on the boat dock visible from both land and water. This requirement shall also be published in the Homeowner's Association Conditions, Covenants & Restrictions (CC&Rs).	
Sensitive Natural Communities/Habitats	*Wildlife Impacts/Indirect Impacts* **MM BR-9.** Street lamps on the Project site shall not exceed 20 feet in height, shall be fully shielded to focus light onto the street surface and shall avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights shall utilize low color temperature lighting (e.g., red or orange). **MM BR-10.** Outdoor lighting for proposed homes on the individual tentative tracts shall not exceed 1,000 lumens. Furthermore, residential outdoor lighting shall not exceed 20 feet in height and must be shielded and focused downward to avoid lighting spillover onto adjacent open space or properties. These restrictions on outdoor lighting of the individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This requirement shall also be published in the Homeowner's Association CC&Rs. **MM BR-11.** To limit the amount of human disturbance on adjacent natural open space areas, signs shall be posted, to the satisfaction of the Planning Director or appointee, along the northern and eastern perimeter of the Project site where the property boundary abuts USFS open space with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash at all times." In addition, a requirement stating that residents shall keep out of adjacent	Less than significant impact

Table ES-1 (cont.): Comparison Between the Original Project, 2010 Alternative Project and the 2011 Alternative Project

Impacts	Mitigation Measures	Level of Significance After Mitigation
	open space areas to the north with the exception of designated trails will be published in the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents. **MM BR-12.** Prior to recordation of the final map, a landscaping plan for the entire tract shall be prepared (inclusive of a plant palette) with an emphasis on native trees and plant species, and such plan shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review shall determine that invasive, non-native plant species are not to be used in the proposed landscaping. The biologist will suggest appropriate native plant substitutes or non-invasive, non-native plants. A note shall be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform to the overall approved tract map landscaping plan. A requirement shall be included stating that residents shall be restricted to the use of tree and plant species approved per the overall tract map landscaping plan. The Homeowner Association CC&Rs shall also require individual lot owners to use only tree and plant species approved per the overall tract map landscaping plan/plant palette.	
Jurisdictional Delineation	**MM BR-13.** Prior to issuance of grading permits, the Project applicant shall obtain all required authorization from agencies with jurisdiction over all unavoidable impacts to State and Federal jurisdictional lakes, streams, and associated habitat within the Project site. Impacted features shall be offset through onsite restoration, offsite restoration, or purchase of credits at an agency-approved mitigation bank in the region at no less than a 3:1 for direct impacts and 1:1 for indirect impacts if impacts cannot be avoided.	Less than significant impact

SECTION 1: PROJECT DESCRIPTION

1.1 - Project Location and Setting

The proposed 62.43-acre Moon Camp project site is located on the north shore of Big Bear Lake, in the unincorporated community of Fawnskin, County of San Bernardino (refer to Exhibit 1-1, Regional Location, and Exhibit 1-2, Local Vicinity). The Big Bear Lake area is primarily a resort community where a major portion (approximately two-thirds) of the residences are second homes. The south shore contains commercial and recreational facilities, including ski areas, hotels, and restaurants, within the incorporated City of Big Bear Lake. By comparison, the north shore area in the vicinity of the Project is less populated and primarily residential, with a small commercial component westerly of the Project site.

State Route 38 (SR-38), also known as North Shore Drive, provides access to the Project site; the road actually transects the property. The Project site is roughly bounded to the north by Flicker Road, to the south by Big Bear Lake, to the east by Polique Canyon Road, and to the west by Canyon Road. In the Township and Range nomenclature system, the Project site is described as being located in the northern half of Section 13, Township 2 North, Range 1 West, San Bernardino Baseline and Meridian (SBBM). San Bernardino County parcel numbers for the site include Assessor's Parcel Numbers (APN) 0304-082-04, 0304-091-12, 0304-091-22, and 0304-091-21. According to the legal description, the site includes Tracts 108, 109, 117, and 118, Township 14 South, Range 14 East, and SBBM. The study area is specifically located at coordinates 34.264 degrees latitude and 116.933 degrees longitude.

An Environmental Impact Report (EIR) for the proposed Moon Camp Project has been circulated for public review and comment on three separate occasions (numbered in this document as): 1) Original Draft EIR - 2004, 2) Revised and Recirculated Draft EIR No. 1, and 3) Revised and Recirculated Draft EIR No. 2, respectively. In addition, the Project's site plan has been revised on three separate occasions and is outlined within this document as: 1) 2004 Original Project, 2) 2010 Alternative Project, and 3) 2011 Alternative Project, respectively.

1.1.1 - Project Site Characteristics

In addition to State Route 38 (SR-38), several dirt trails (generally associated with unauthorized off-road vehicle use) traverse the Project site, which is located approximately 1 mile south of the Pacific Crest Trail; a trail that stretches between the US/Mexican border and the US/Canadian border. Site elevations range from approximately 6,744 feet above mean sea level (msl) at the lakeshore to 6,960 feet above msl at the northeast corner of the site. Individual slopes on-site range from 5 percent to 40 percent. Slope orientation is generally from north to south toward the lake, except for three natural ravines on the Project site that contain eastern and western slopes. Vegetation and habitat

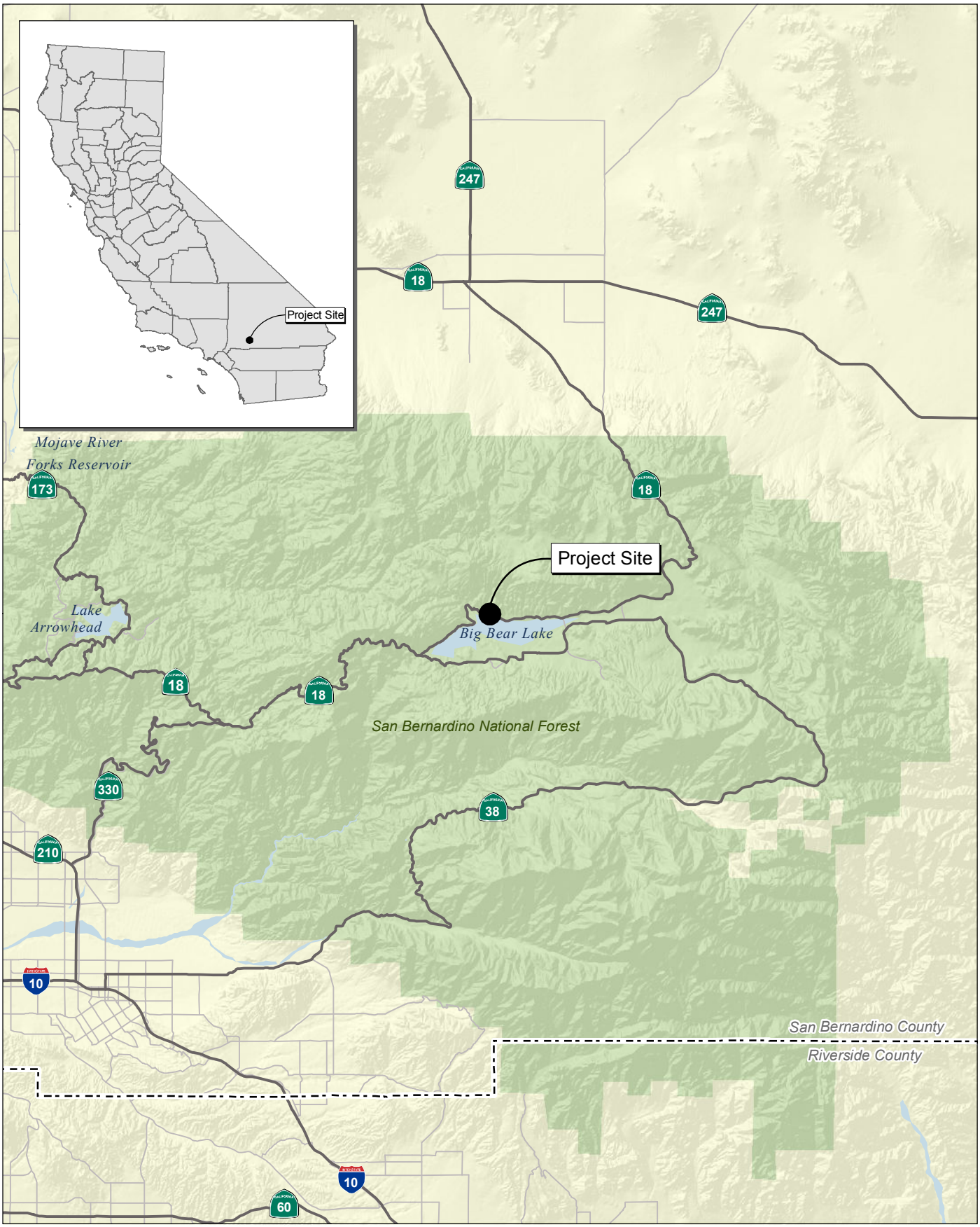
types in the Project area include open Jeffery Pine forest (with an average density of 44.4 trees per acre) and pebble plain soil like conditions in the western portion.

1.1.2 - Existing Land Use

The Project site is currently undeveloped and is designated in the County of San Bernardino, Bear Valley Community Plan (BV) as Rural Living with minimum 40-acre lots (BV/RL-40) (refer to Exhibit 1-3, Land Use Designations). The RL-40 land use designation is identified as a "Holding Zone" within the Bear Valley Community Plan, which states: future development proposals (such as Moon Camp) within the RL-40 designation will be considered based on a demonstrated ability to provide adequate infrastructure and maintain consistency with the goals and policies of the 2007 Community Plan. Table 2-1, Existing Land Use and Land Use Designations, identifies the land use category of the site and surrounding properties, as well as the current land use designations.

Table 1-1: Existing Land Use and Official Land Use Zoning District

Existing Land Use		Official Land Use Zoning District (Bear Valley Community Plan)
Project Site	Vacant	Rural Living (BV/RL-40). This district provides sites for open space and recreational activities, single-family homes on very large parcels and similar and compatible uses. Minimum parcel size is 40 acres; 1 dwelling unit per parcel. This is considered a holding zone designation in the Bear Valley Community Plan, which indicates that future General Plan amendments will be considered where specific development proposals within the RL-40 designation demonstrate an ability to provide adequate infrastructure to serve the development and maintain consistency with the goals and policies of the Bear Valley Community Plan.
North	Residential (N and NW), Forest (N and NE)	Residential (BV/RS). One dwelling unit per 0.25 acre and a minimum lot size of 7,200 square feet. US Forest Service administered land.
South	Big Bear Lake, Residential (SE)	Floodway (FW). Uses permitted at owners risk; minimum parcel size is 10 acres. Single Residential (BV/RS). Four dwelling units per acre, minimum lot size is 7,200 square feet.
East	Vacant, Residential (SE) Forest (N and NE)	Single Residential (BV/RS). One dwelling unit per 0.25 acre and a minimum lot size of 7,200 square feet. Resource Conservation (BV/RC). Minimum parcel size is 40 acres; 1 dwelling unit per parcel. US Forest Service administered land.
West	Vacant, Residential	Special Development (BV/SD-RES). Minimum parcel size 40 acres. This District provides sites for a combination of residential uses. Single Residential (BV/RS). Four dwelling units per acre, minimum lot size is 7,200 square feet.
Sources: Bear Valley Community Plan, 2007; County of San Bernardino Development Code, 2007.		



Source: Census 2000 Data, The CaSIL, MBA GIS 2009.

Michael Brandman Associates

NORTH

5 2.5 0 5 Miles

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Exhibit 1-1
Regional Location Map

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Source: National Agriculutre Imagery Program, San Bernardino County (2009).

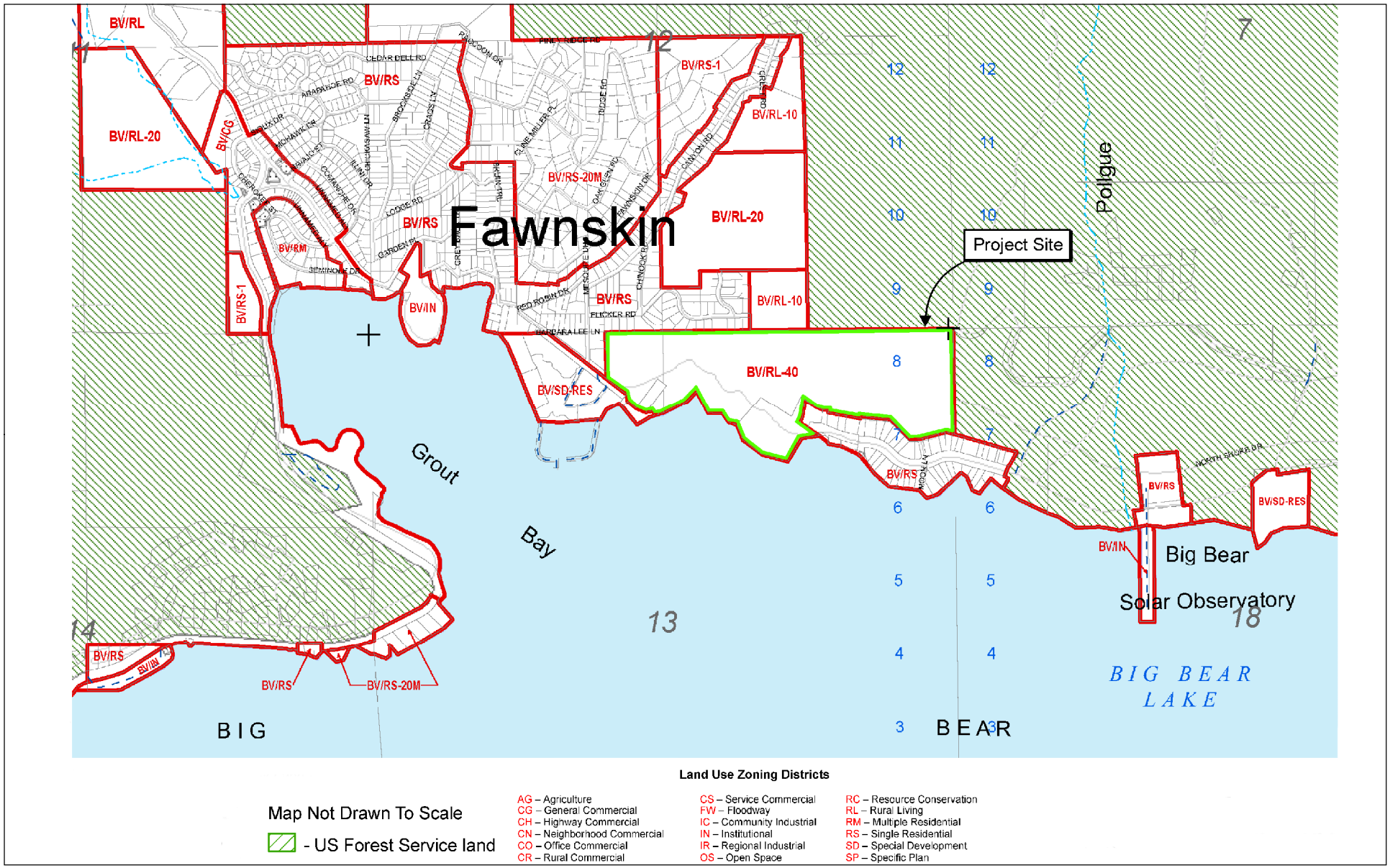
NORTH

2,000 1,000 0 2,000

Feet

Michael Brandman Associates

Exhibit 1-2
Project Vicinity Map
Aerial Base



Source: San Bernardino County Land Use Plan GENERAL PLAN (2007).

Michael Brandman Associates

NORTH

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Exhibit 1-3
Land Use Designations

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

1.1.3 - Community History

A marshy portion of the nearly flat floor of Bear Valley was dammed in 1884 to provide a reservoir (Big Bear Lake) to retain irrigation water for release to the Redlands area of the eastern San Bernardino Valley. In 1912, a larger 72-foot multiple arch dam was constructed about 300 feet downstream of the old dam, increasing the lake capacity to 73,000 acre feet. Tourism in the area began with the onset of the automobile age and the eventual establishment of highways accessing the relatively remote area.

Maximum elevation at the lake surface is 6,744 feet above msl, but the actual level fluctuates according to annual snowmelt and runoff. The dam is owned by the Big Bear Municipal Water District. The lake has an east-west length of approximately 7 miles and is approximately 2.5 miles at its widest, though most of the lake's width averages a little more than 1 mile. Big Bear Lake measures 72 feet deep at the dam. It is completely rain- and snow-fed, having no other source of tributary or mechanical replenishment other than natural precipitation.

The Community of Fawnskin was founded in 1916, and by 1928, there were at least nine resort camps in the area, including Moon Camp, which was built in 1919. The project site has remained primarily vacant since destruction of the original camp in 1951. The current property owner purchased the marina permit along with the property in 1969. Site improvements currently include three water wells and SR-38, which transects the property from east to west.

2011 Alternative Project Characteristics

The 2011 Alternative Project incorporates very minor revisions to the 2010 Alternative Project as analyzed in the Revised and Recirculated Draft EIR No. 1. The 2011 Alternative Project consists of the subdivision of the site into 58 lots—50 numbered lots (single family residential lots) to be sold individually and developed into custom homes; and eight lettered lots described as follows:

- Three designated as Open Space/Conservation easements and Neighborhood Lake Access;
- Three designated as well sites;
- One designated as a potential reservoir site; and
- One would be developed as the marina parking lot.

The 2011 Alternative Project proposes 6.2 acres of open space/conservation/Neighborhood Lake Access within the Project site. The 2011 Alternative Project also includes a 55-slip marina. The marina parking lot also includes some open space for the preservation of existing trees; however, because of the development of the parking lot, the lot would not be considered Open Space. The main differences between the 2010 Alternative Project and the 2011 Alternative Project that is the subject of this Revised and Recirculated Draft EIR No. 2 and are summarized below:

- Redesigned Residential Lot Layout. The 2011 Alternative Project still reflects development of 50 residential lots on approximately 62.43 acres. The 2011 Alternate Project does not increase development intensity but merely proposes a revised lot configuration. Lots 1-3, which were

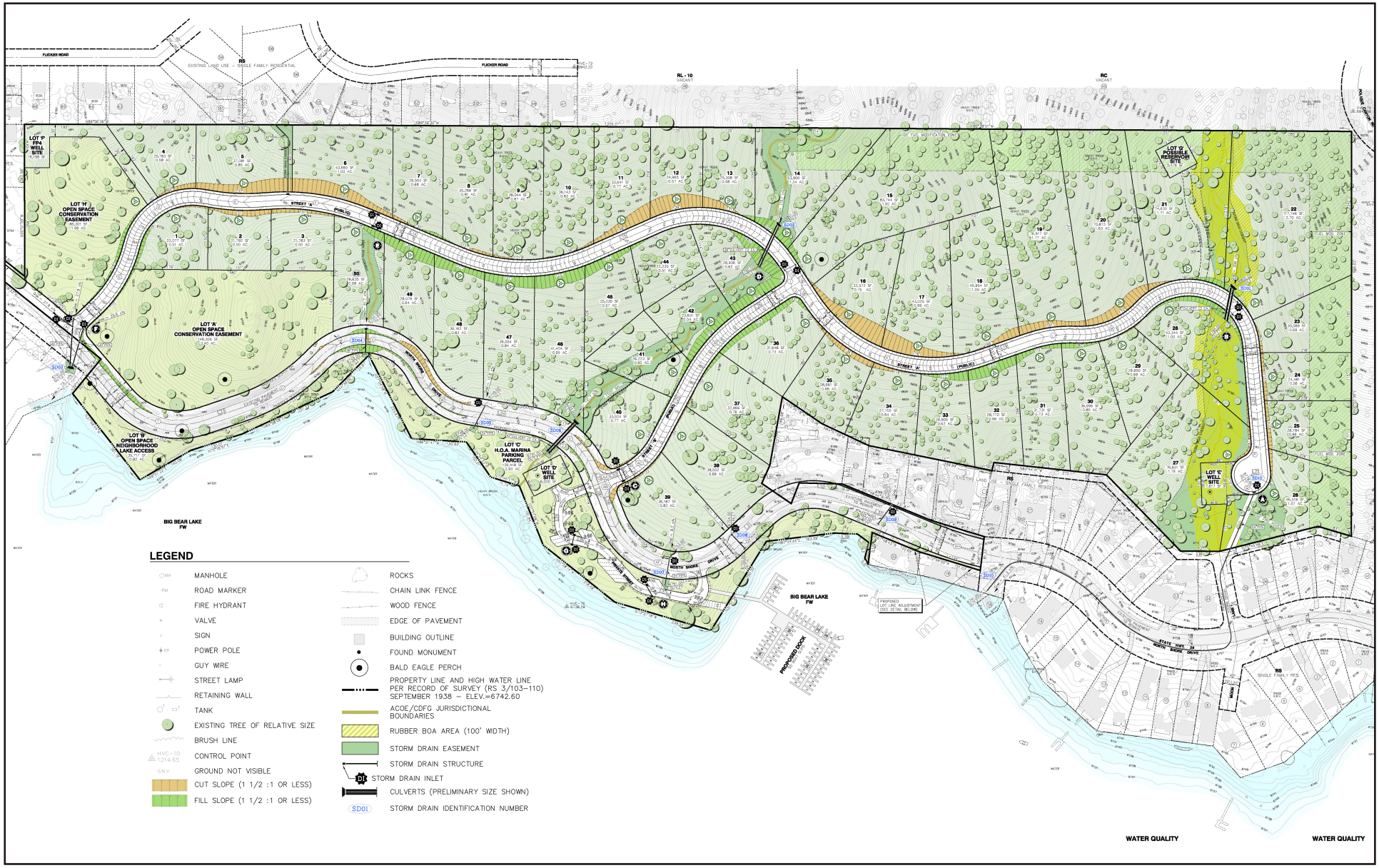
located north of Street A on the western-most portion of the Project site have been shifted east and will be located in an area previously occupied by a portion of Lot A which was designated as Open Space Conservation Easement. (Please see Exhibit 1-4)

- Creation of Open Space Lot H. To compensate for the loss of a portion of Lot A, previously designated as Open Space Conservation Easement, and in response to the Supplemental Focused Special Status Plant Species Survey (August 29, 2010) which identified significant occurrences of Ashy-Gray Indian Paintbrush in the area previously designated for development, a 1.98 acre portion of the Project site previously occupied by Lots 1-3 will now become lettered Lot H which, like Lot A, is designated Open Space/Conservation Easement.

The revisions to the 2011 Alternative Project do not increase or alter development type or intensity but merely redistribute the developable lots in order to minimize impacts to the Federally Threatened Ashy-Gray Indian Paintbrush plant species and the discovery that the prior portion of Lot A characterized as pebble plain habitat was mischaracterized. Aside from the redesign of three developable lots and creation of an additional Open Space lettered lot, nothing about the Project changed. Accordingly, as indicated in detail below, the remainder of the Project components remain unchanged.

Infrastructure

A water service feasibility study entitled "Final Feasibility Study to Serve the Proposed Moon Camp Residential Development (Tentative Tract Map No. 16163)," was prepared by Alda Engineering, Inc., in March 2007 (and updated in 2011), to address issues raised in comments received on the Original Draft EIR - 2004. In addition, the sewer feasibility study prepared by So & Associates was updated to reflect the revisions to the Moon Camp site plan. This study entitled, "County Service Area 53, Improvement Zone B (CSA 53-B) Updated Sewer Feasibility Study for APNs 0304-091-12, -21, -22, and 0304-082-04, TTM 16136 RCK Properties, Inc./Moon Camp," prepared April 11, 2007. Both studies are included in Appendix G of the Revised and Recirculated Draft EIR No. 1. Based on the analysis and recommendations included in these studies, the following water and sewer infrastructure components are proposed as part of development of the 2011 Alternative Project.



Source: Hicks & Hartwick, Inc.

NORTH

Michael Brandman Associates

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Exhibit 1-4
Moon Camp TTM No 16136
Proposed 2011 Alternative Project

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Source:

Michael Brandman Associates

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Exhibit 1-5
Moon Camp TTM No. 16136 Revised Alernative Project-2011

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MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Water Service Options and Infrastructure

There are currently three (3) separate water service options for the 2011 Alternative Project. Under Alternative #1, significant improvements to the Big Bear Department of Water and Power (DWP) upper Fawnskin pressure zone are necessary to provide water service to the site. The three ground water production wells located within the Project site would be deeded to the DWP at the time the tract map is recorded. Annexation to the DWP's authorized service area is required for DWP to be the water service provider. DWP has conducted a Water Feasibility Study (Alda 2007), and provided a conditional will serve letter to the Applicant. However, the majority of the Project site is outside of the DWP authorized service area as well as the City's Sphere of Influence. DWP cannot provide water service without first complying with the provisions of Government Code Section 56133, which pertains to the Local Area Formation Commission (LAFCO) annexation process. In order for the DWP to provide water service to the Project site and to own and operate the 2011 Alternative Project's water system, LAFCO would have to approve an expansion of the City of Big Bear Lake's Sphere of Influence to include the entire existing DWP Water Service Area in Fawnskin as well as the entire Project site. The developer would be required to construct the on-site and off-site facilities as described in the DWP's Water Feasibility Study (Alda 2007), as amended by the 2011 update, as discussed below.

The Water Feasibility Study provides two options (A and B) for expanding the existing Fawnskin Water System infrastructure. Option B has been chosen by DWP and the Applicant as the preferred Water Feasibility Study alternative for Water Service Alternative #1. In either case, the Applicant would install all common infrastructures, including fire hydrants, and would also install the water main lines within the project site. The water improvements will primarily be constructed within the rights-of-way of existing or proposed paved roads. The water service infrastructure required is as follows:

- 900 ft of 12-inch pipeline along Ridge Road from the intersection of Raccoon Drive south to tie to an existing 8-inch PVC pipeline on a private easement.
- 200 ft of 12-inch pipeline along private easement to connect Fawnskin Drive and Canyon Road.
- 650 ft of 12-inch pipeline along Canyon Road to Chinook Road.
- 600 ft of 12-inch pipeline along Chinook Road to Flicker Road.
- 500 ft of 12-inch pipeline along Flicker Road to Mesquite Drive.
- 400 ft of 12-inch pipeline along Mesquite Road to North Shore Drive.
- 250 ft of 12-inch pipeline along North Shore Drive to development westerly boundary.
- Refurbishing existing Cline Miller pump station to augment pumping capacity to approximately 300 gmp.
- 50 KW on-site emergency generators at the Cline Miller Reservoir.

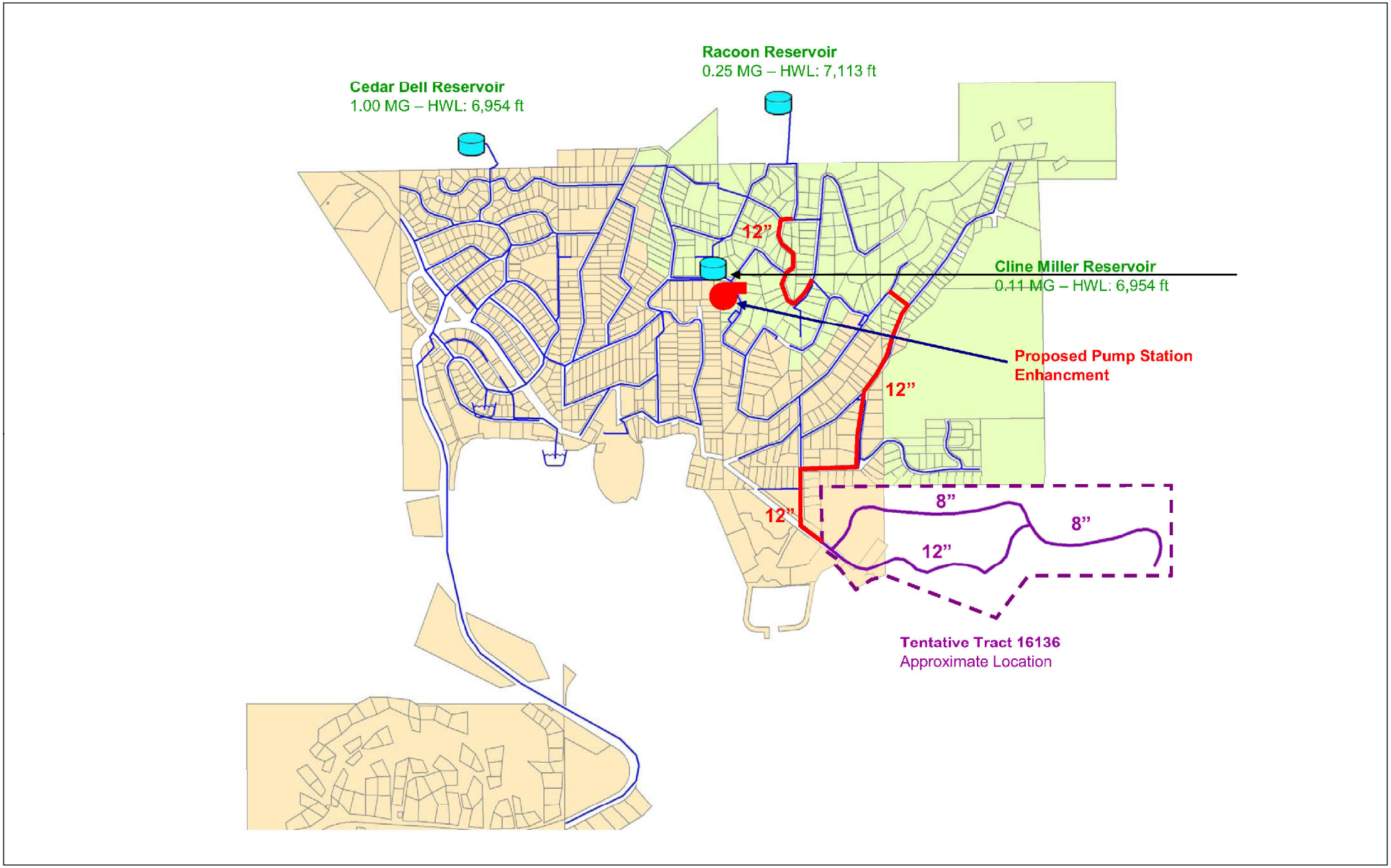
See Exhibit 1-6 for the proposed water facilities and improvements.

Water Service Alternative #2 (see Section 4.9 of the Revised and Recirculated Draft EIR No. 1 for details) would not require LAFCO's approval and would not create the need for expansion of the City's Sphere of Influence around Fawnskin and the project site. Instead, County Service Area 53C (CSA 53C) would own and operate the water facilities within the project site and contract with the DWP for a water interconnection to the existing Fawnskin water system. The developer would be required to construct the same on-site and off-site facilities as described above.

Under Water Service Alternative #3 (see Section 4.9 of the Revised and Recirculated Draft EIR No. 1 for details), instead of constructing the off-site water facilities (within the Fawnskin Water System) identified in the DWP's Water Feasibility Study Option B (Alda, 2007, which is the basis for Water Service Alternatives #1 and #2, above), water service would be provided entirely from an onsite water supply, storage and distribution system. Water would be extracted from the onsite water wells; the 2011 Alternative Project would require construction of an on-site aboveground water tank (238,600 gallons) and an on-site booster station capable of providing the daily water supply flow and the required 1,750 gallons per minute fire flow. The water tank and booster station would be sized based upon the same demand calculations contained in the Water Feasibility Study and Water Service Alternatives #1 and #2. Water Service Alternative #3 would not require LAFCO's approval and would not require the expansion of the City's Sphere of Influence around Fawnskin and the project site. The developer would also construct the same on-site (within the Project site) water facilities (water main lines, fire hydrants, etc) identified in the Alda Water Feasibility Study necessary to transmit water to the developed lots within the 2011 Alternative Project. Existing water wells FP2 and FP4 would be connected to the on-site water system and pump their water into the 238,600 gallon on-site reservoir. The on-site booster station would produce the Average and Maximum Daily Demand flows (8.68 gpm and 15.27 gpm) and the Fire Flow of 1,750 gpm for the 2-hour duration. The booster station would include an emergency electrical generator to allow the station to operate during a power outage. The water improvements for Water Service Alternative #3 will primarily occur within the 2011 Alternative Project's paved roads and at the 2011 Alternative Project's water tank site. The construction of the water tank would include grading of an approximately 75-foot-diameter pad for the reservoir. CSA 53C would own and operate this independent water system.

Projected water demand for the proposed Moon Camp 50-lot subdivision (2011 Alternative Project) is based on the Water Feasibility Study's consumption rate of 250 gallons per day (gpd) per connection. Exhibit 1-6, Proposed Water Facilities, shows the Water Feasibility Study's proposed Moon Camp water system. Maximum day demand is estimated based on information provided in the DWP Water Master Plan and it is equivalent to 1.76 times the average day demand. Therefore, the average and maximum day demands for the 2011 Alternative Project are estimated as follows:

- Average Day Demand (ADD) = 12,500 gpd or 8.68 gpm; and
- Maximum Day Demand (MDD) = 15.27 gpm.



Source: ALDA Engineering Inc.

Michael Brandman Associates

NORTH

Not to Scale

Exhibit 1-6
Proposed Water Facilities

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MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Based on an estimated average day demand of 12,500 gallons, the annual water demand for the 2011 Alternative Project is estimated at 4.56 million gallons or 14.0 acre-feet per year.

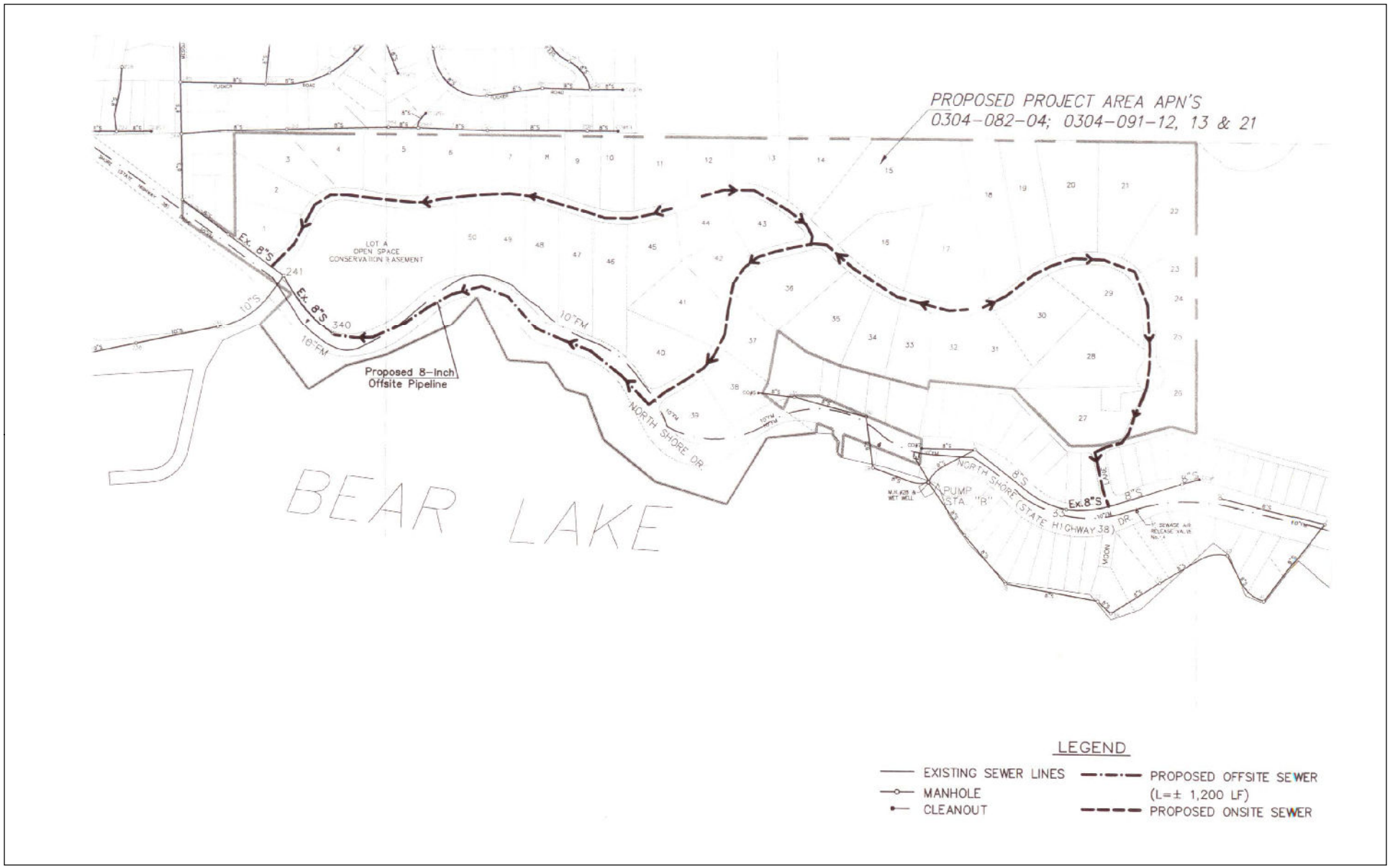
Wastewater Service

The Project site is located within County Service Area 53, Improvement Zone B (CSA 53B) administered by the County of San Bernardino Special Districts Department. The Sewer Feasibility Study indicated that the existing sewer system located adjacent to the project site to the southeast and southwest is capable of handling the wastewater flows from the 2011 Alternative Project.

The Applicant would be responsible for all plumbing and sewer facilities located within the site, including manholes and connection to the CSA 53B system at locations that have been approved by CSA 53B. Exhibit 1-7, Proposed On-site Sewer Facilities, shows the preliminary system. The Applicant would also be responsible for an off-site sewer extension of approximately 1,200 linear feet along North Shore Drive to connect to an existing CSA 53B collector sewer to the southwest of the property. This extension would accommodate the westerly lots; the easterly lots would be served by a gravity sewer extended to the existing CSA 53B Pump Station B to the southeast of the property. Depending upon where some of the houses are built, some lots may require a residential sewage pump station to transport the lot's sewage up to the sewer line in the street adjoining the property. The wastewater conveyance system on-site would be designed to accommodate these conditions and would be subject to review and approval by the County Special District's Engineer. In addition, regional connection fees would be imposed by the Big Bear Area Regional Wastewater Authority (BBARWA).

Roadway Facilities

The 2011 Alternative Project will include a development of roadway facilities to service the project and provide direct access for the residents to SR-38. The 2011 Alternative Project proposes two points of ingress and egress from SR-38 with Street "A" terminating on the east-end of the Project in the cul-de-sac. The 2011 Alternative Project roadway system will consist of standard two-lane roadways with two stop sign-controlled intersections on SR-38 and one intersection interior to the Project. Development of the roadway infrastructure will occur at one time at the initial phase of 2011 Alternative Project development.



Source: ALDA Engineering Inc.

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Not to Scale

Michael Brandman Associates

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Exhibit 1-7
Proposed Sewer Facilities

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

SECTION 2: BIOLOGICAL RESOURCES

2.1.1 - Introduction

This section describes the biological character of the Project site in terms of plants, wildlife, and wildlife habitats, and analyzes the biological significance of the site in view of federal, State, and local laws and policies. This section evaluates the potential 2011 Alternative Project impacts to biological resources on-site and in the vicinity of the Project site and recommends mitigation measures, where feasible, to reduce the significance of impacts that are identified.

All biological studies were conducted in accordance with accepted scientific and technical standards that are consistent with the requirements of the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG). The following reports were used in the preparation of this section and are included in Appendix A:

- Results of Bald Eagle Survey on Tentative Tract 16136, Moon Camp, Fawnskin, San Bernardino County, California, Bonterra Consulting (2002);
- Focused Flying Squirrel Trapping Report, Moon Camp Project, Fawnskin, San Bernardino, California, Michael Brandman Associates (2007);
- Moon Camp Property, Fawnskin Area: Vegetation and Special Status Plants, Scott White Biological Consulting (2007);
- Site Assessment and Review of Previously Prepared Biological Documentation of the Proposed Moon Camp Tentative Tract (TT) 16136 Project Site near Fawnskin, San Bernardino County, California, Michael Brandman Associates (January and February 2007);
- Southern Rubber Boa Letter Report from Glenn Stewart of the Biological Sciences of California State Polytechnic University of Pomona (2007);
- Southwestern Willow Flycatcher Focused Survey Report Moon Camp Project, Fawnskin, San Bernardino County, California, Michael Brandman Associates (2007);
- Moon Camp Tentative Tract 16136 Supplemental Focused Special Status Plant Species Survey, Timothy Krantz Environmental Consulting (2008);
- Bald Eagle Count in Area, Moon Camp, Fawnskin, San Bernardino County, California, US Forest Services (2009);
- Revised Moon Camp Property, Fawnskin Area: Vegetation and Special Status Plants, Scott White Biological Consulting (2009); and
- Moon Camp Tentative Tract 16136 Supplemental Focused Special Status Plant Species Survey, Timothy Krantz Environmental Consulting (2010).

A Supplemental Focused Special Status Plant Species Survey (Timothy Krantz Environmental Consulting, 2010) was conducted (included in Appendix A-11) to address comments submitted by concerned parties with regard to the Revised and Recirculated -2010 Draft EIR No. 1 for the Moon Camp 50-Lot Residential Subdivision, Tentative Tract 16136. Specifically, this botanical survey focused on clarifying the following information:

- Reconcile differences between the findings of Scott White (White 2007) and Krantz (2008) with regard to the presence or absence of Ashy-Gray Indian Paintbrush (Castilleja cinerea) which is listed as federally threatened;
- Provide additional quantitative and qualitative information with regard to Ashy-Gray Indian Paintbrush and any other formally-protected plant species on site;
- Consider potential off-site impacts on the U.S. Forest Service pebble plain habitat area known to occur to the northeast of the Project site; and
- Provide comparable quantitative and qualitative information with regard to the proposed off-site pebble plain mitigation area located at the terminus of Dixie Lee Lane.

The findings within the Supplemental Focused Special Status Plant Species Survey (Timothy Krantz Environmental Consulting, 2010) augment the Supplemental Focused Special Status Plant Species Survey conducted by Dr. Timothy Krantz, dated June 29, 2008, providing an additional above-average precipitation year for observation. Particular attention was given to assessing the distribution and abundance of Ashy-Gray Indian Paintbrush —as this is the only formally-listed rare plant species identified on the Moon Camp property. The Moon Camp Tentative Tract 16136, Supplemental Focused Special Status Plant Species Survey (August 29, 2010) is located within Appendix A of this Revised and Recirculated Draft EIR No. 2.

2.1.2 - Existing Conditions

The Moon Camp project site (Tentative Tract No. 16136) is located approximately midway along the north shore of Big Bear Lake, at the eastern edge of the community of Fawnskin. The 62.43-acre site slopes upward from the lakeshore and State Route 38 (SR-38) (Lakeshore Drive) from a lake surface elevation of approximately 6,747 feet above mean sea level (msl) to approximately 6,960 feet msl at the northeast boundary. Slopes vary from 5 to 40 percent and continue upward beyond the property to a ridgeline exceeding 7,800 feet msl on the north. The on-site variation in elevation is approximately 213 feet.

2.1.3 - Vegetation Communities

Plant communities in California have generally been classified by biologists either according to Holland's Preliminary Descriptions of the Terrestrial Natural Communities of California (1986) or Sawyer and Keeler-Wolf's A Manual of California Vegetation (1995). Holland's descriptions were developed as part of CDFG's California Natural Diversity Database (CNDDB), and Sawyer and Keeler-Wolf's manual was developed through the California Native Plant Society (CNPS). The

CDFG now has a list of terrestrial natural communities which supersedes all other lists developed by the CNDDB. It is based on Sawyer and Keeler-Wolf's manual but it is also structured to be compatible with previous CNDDB lists such as Holland. Wherever applicable the plant communities are classified according to CDFG's list of terrestrial natural communities (2003) and cross-referenced to Holland's element code. Disturbed and developed areas are described according to industry standard descriptions. The CDFG does not currently have a narrative description of these vegetation communities; therefore, the descriptions provided below are according to Holland.

Four vegetation types occur within the Project site. Exhibit 2-1, Plant Communities Map, illustrates their distribution and Table 2-1 summarizes the extent of vegetation types present within the Project site. Each of the vegetation types observed during field surveys are described below.

Table 2-1: Existing Vegetation Types on the Project Site

Vegetation Type	Acreage
Jeffrey Pine Forest	54.92
Pebble plain like soil conditions*	0.69
Lake Shoreline/ Ruderal	4.0
Developed (SR-38)	2.82
Total	62.43

* The Supplemental Focused Special Status Plant Species Survey (August 29, 2010)) concludes that the pebble plain like soil conditions determined to be located within Lot A (as identified within the Supplemental Focused Special Status Plant Species Survey, 2008), is not true pebble plain due to the lack of the two indicator species (*Arenaria ursina* and *Eriogonum kennedyi austromontanum*).

Jeffrey Pine Forest

Jeffrey pine forest occurs on 54.92 acres primarily in the most eastern portion of the Project site. This area is dominated by Jeffrey pine (*Pinus jeffrey*i) with white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis)*, singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occurring at lower densities. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), Greg's ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus leucodermis*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches. Jeffrey pine forest occurs at elevations ranging from 3,200 to 7,800 feet above msl in Southern California.

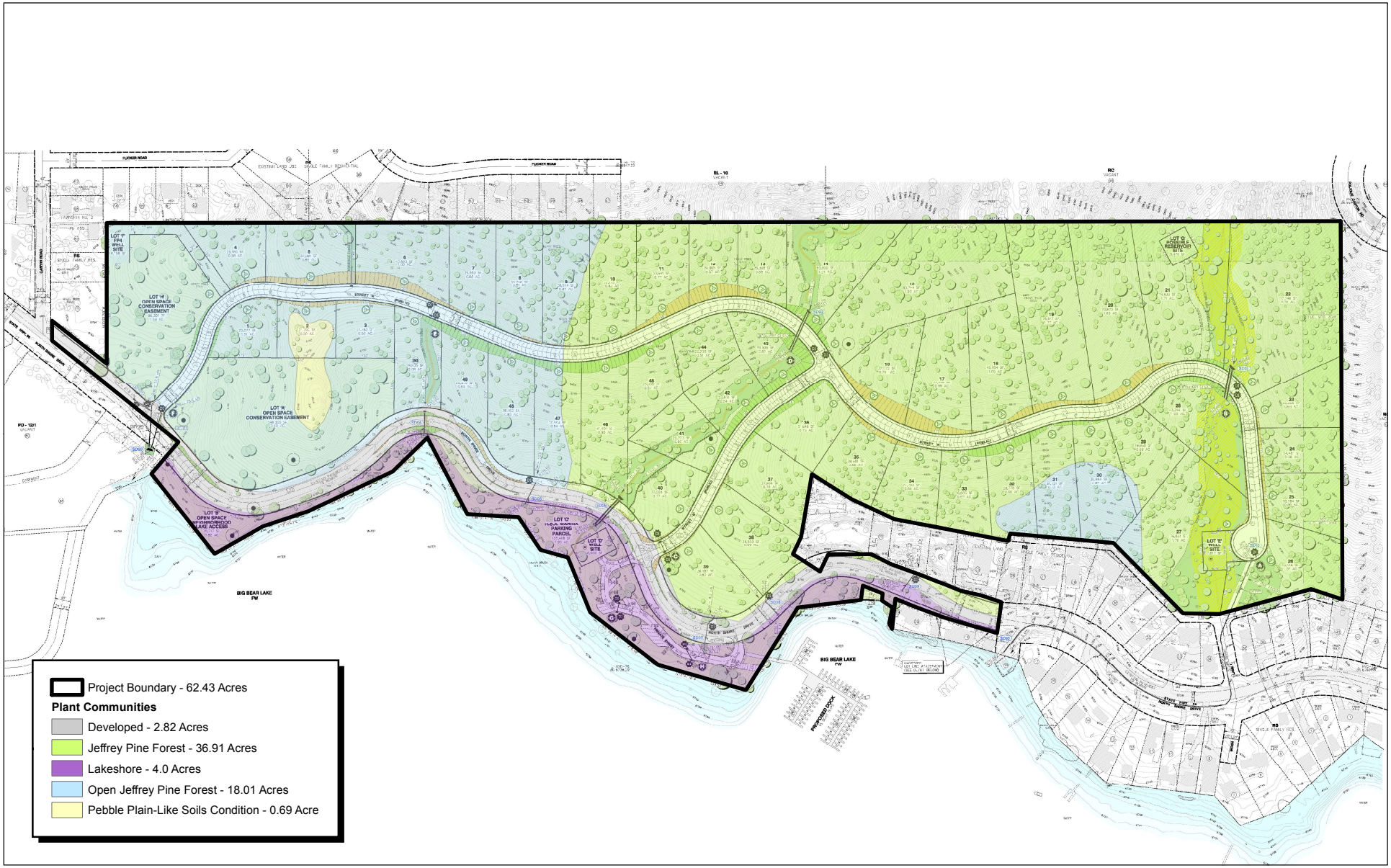
Open Jeffrey pine forest is shown as a separate vegetation type on Exhibit 2-1. Areas within the Jeffrey pine forest that are more open and where herbaceous cover is dominated by Wright's matting buckwheat are suitable habitat for the federally-listed Threatened Ashy-Gray Indian Paintbrush, CNPS 1B listed (which include plants that are rare, threatened, or endangered in California and

elsewhere) Parish's rock-cress (*Arabis parishii*), and CNPS 1B listed silver-haired ivesia. Of the 54.92 acres of Jeffrey Pine forest, 18.01 acres are considered open Jeffrey Pine forest habitat.

Consideration of Pebble Plain

Drought related conditions, occurring during the first half of this decade resulted in certain sensitive plant species being more difficult to locate and identify due to dormancy factors attributable to drought. Therefore, the surveys that were conducted during 2000-2007 attempted a more focused approach in order to identify all suspected areas probable for containing threatened pebble plain species. Understanding the impact of drought for certain species, including the Federally Threatened Ashy-Gray Indian Paintbrush, these surveys considered certain areas to be occupied despite the actual lack of identifiable species, assuming their presence would occur during years of normal rainfall. This practice, through trial and error, resulted in an over-calculation of species present on the Project site, which is apparent in the 2008 and 2010 Krantz Supplemental Focused Special Status Plant Species Survey. The Supplemental Focused Special Status Plant Species Surveys conducted in years normal or above average rainfall, identified an accurate distribution of Ashy-Gray Indian Paintbrush species within the Project site.

The 2008 Supplemental Focused Special Status Plant Species Survey concluded that Pebble plain soil like conditions occurred on approximately 0.69 acres of the Project site, north of State Route 38 (SR-38). The report stated that it appeared as a distinct open patch within open Jeffrey pine forest in the western portion of the Project site and that the substrate in this area consisted of clay soil mixed with quartzite pebbles and gravel that were continually pushed to the surface through frost action. If so, this substrate would support a high floristic diversity consisting of small cushion-forming plants, tiny annuals, grasses, and succulents that are well spaced, low growing, and sun tolerant. Several rare and special status plants are associated with pebble plain habitat. The 2011 Alternative Project was designed to include the 0.69 acre pebble plain occurrence within Lot "A", an area designated as open space to be protected in perpetuity through a formal conservation easement. A Supplemental Focused Special Status Plant Species Survey (August 29, 2010) was conducted to respond to concerns raised in comments received on the Revised and Recirculated Draft EIR No. 1. The Supplemental Focused Special Status Plant Species Survey (August 29, 2010) concludes that the pebble plain-like soil conditions located within Lot A (as identified within the Supplemental Focused Special Status Plant Species Survey, 2008), is not true pebble plain due to the lack of the two key indicator species (*Arenaria ursina* and *Eriogonum kennedyi austromontanum)*. The Supplemental Focused Special Status Plant Species Survey (August 29, 2010) findings augment the Supplemental Focused Special Status Plant Species Survey conducted by Dr. Krantz, dated June 29, 2008, providing an additional above-average precipitation year for observation. Therefore, based on the finding of the Supplemental Focused Special Status Plant Species Survey (August 29, 2010), no pebble plain habitat exists on the 2011 Alternative Project site. See Exhibit 2-2 for the location of pebble plain soil conditions.



Source: Source: Hicks & Hartwick, Inc. (December 2010), Tim Krantz (2008), Scott White & MBA.

NORTH

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Michael Brandman Associates

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Exhibit 2-1
Plant Communities Map

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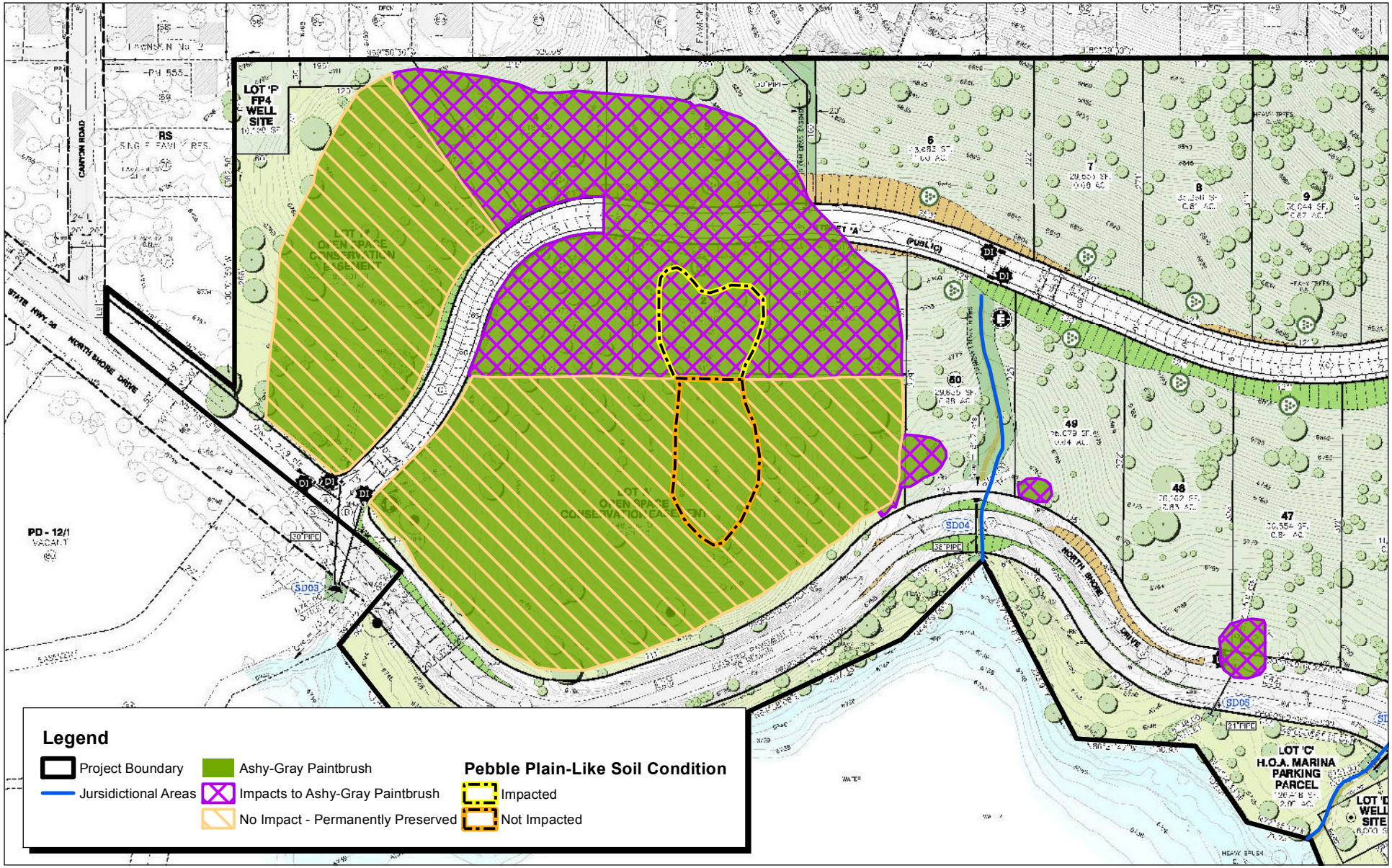

Source: Hicks and Hartwick, Inc.

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Michael Brandman Associates

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Exhibit 2-2
Occupied Ashy-Gray Indian Paintbrush and Pebble Plain Soil Conditions

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Lakeshore Species

Approximately 4.0 acres of the southern boundary of the Project site is formed by the shore of Big Bear Lake. Plant species along the shore itself consist primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Several seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*) also occur in this plant community. Small patches of ruderal species transitioning into upland grassland occur along the lakeshore south of SR-38. The lake was well below its maximum level in 2001 to 2002 due to acute drought conditions. Vegetation in the narrow strip is patchy and occurs above the high-water level in areas where small areas of Jeffrey pine forest are interspersed among open ruderal vegetation and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*).

Developed

Developed areas (abutting SR-38) occur on 2.82 acres along the shoreline of the Project site. Plants found in this vegetation type consist of native and non-native ornamental species which offer very little habitat value for native wildlife species. Paved areas such as SR-38 and existing turnouts are included in this vegetation type.

Wildlife

The project site has the potential to support a large variety of wildlife species which are discussed in detail in the following sections.

Amphibians

Amphibians require moisture for at least a portion of their life cycle and many require standing or flowing water for reproduction. Although more typical in mesic conditions, there are a number of amphibians species that occur or potentially occur even in the more xeric habitats. These species are able to survive in dry areas by remaining beneath the soil in burrows, under logs or leaf litter, and emerging only when temperatures are low and humidity is high. Many of these species' habitats are associated with water, and they emerge to breed once the rainy season begins. Soil moisture conditions can remain high throughout the year within some habitat types, depending on factors such as amount of vegetation cover, elevation, and slope aspect.

No amphibians were detected during the field surveys; however, leaf litter and rotting logs on the Project site provide potential habitat for the Pacific slender salamander (*Batrachoseps pacificus*). The western toad (*Bufo boreas*) would also be expected to occur on the Project site.

Reptiles

Reptilian diversity and abundance typically vary with vegetation type and character. Many species prefer only one or two vegetation types; however, most will forage in a variety of habitats. Most species occurring in open areas use rodent burrows for cover and protection from predators and extreme weather conditions. Those species discussed below that were not observed during surveys

are expected to occur based on the presence of suitable habitat (substrate and vegetation) within the Project site.

Reptile species observed during the surveys include the western fence lizard (*Scleroporus occidentalis*), sagebrush lizard (*Sceloperus graciosus*), western skink (*Eumeces skiltonianus*), southern alligator lizard (*Elgaria multicarinatus*), and southern Pacific rattlesnake (*Crotalus viridis helleri*). Common reptile species expected to occur on the Project site include the side-blotched lizard (*Uta stansburiana*) and gopher snake (*Pituophis melanoleucus*).

Birds

Montane conifer forests in the San Bernardino Mountains can experience severe weather conditions during the winter months. Nonetheless, several resident bird species are expected to occur on the Project site, using the habitats throughout the year. Other species are present only during certain seasons.

Common resident bird species observed on the Project site during surveys include the following:

- Band-tailed pigeon (*Columba fasciata*);
- Great-horned owl (*Bubo virginianus*);
- Acorn woodpecker (*Melanerpes formicivorus*);
- Red-breasted sapsucker (*Sphyrapicus ruber*);
- Hairy woodpecker (*Picoides villosus*);
- Nuttall's woodpecker (*Picoides nuttallii*);
- Northern flicker (*Colaptes auratus*);
- Black phoebe (*Sayornis nigricans*);
- Stellar's jay (*Cyanocitta stelleri*);
- Common raven (*Corvus corax*);
- Mountain chickadee (*Poecile gambeli*);
- Bushtit (*Psaltriparus minimus*);
- Red-breasted nuthatch (*Sitta canadensis*);
- White-breasted nuthatch (*Sitta carolinensis*);
- House wren (*Troglodytes aedon*);
- Western bluebird (*Sialia mexicana*);
- Northern mockingbird (*Mimus polyglottos*);
- European starling (*Sturnus vulgaris*);
- Spotted towhee (*Pipilo maculatus*);
- Dark-eyed junco (*Junco hyemalis*);
- Brewer's blackbird (*Euphagus cyanocephalus*);
- Brown-headed cowbird (*Molothrus ater*);
- House finch (*Carpodacus mexicanus*);
- Red crossbill (*Loxia curvirostra*); and
- Wild turkey (*Meleagris gallopavo*).

Mammals

The ornate shrew (*Sorex ornatus*), brush mouse (*Peromyscus boylii*), western grey squirrel (*Sciurus griseus*), California ground squirrel (*Spermophilus beecheyi*), dusky-footed woodrat (*Neotoma fuscipes*), California vole (*Microtus californicus*), and coyote (*Canis latrans*) were observed on the Project site during the surveys. Larger mammals that may occur on the Project site include the gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), badger (*Taxidea taxus*), and mountain lion (*Felis concolor*). The California myotis (*Myotis californicus*) and big brown bat (*Eptesicus fuscus*) may occur on the Project site. Gaps in peeling bark and hollow snags or limbs provide potential roosting and maternal colony opportunities for these and other bat species. Other mammals expected to occur on the Project site include the following:

- Dusky shrew (*Sorex monticolus*);
- Broad-footed mole (*Scapanus latimanus*);
- Merriam's chipmunk (*Tamias merriami*);
- Lodgepole chipmunk (*Tamias speciosus*);
- Golden-mantled ground squirrel (*Spermophilus lateralis*);
- Deer mouse (*Peromyscus maniculatus*);
- Western harvest mouse (*Reithrodontomys megalotis*);
- Botta's pocket gopher (*Thomomys bottae*); and
- House mouse (*Mus musculus*).

Special Status Biological Resources

The following discussion addresses special status biological resources observed, reported, or having the potential to occur on the Project site. These resources include plant and wildlife species that have been afforded special status and/or recognition by federal and state resource agencies, as well as the CNPS. Table 2-2, Special Status Plant Species, and Table 2-4, Special Status Wildlife Species, provide a summary of special status plant and wildlife species known to occur in the region of the Project site, and includes information on the status, potential for occurrence, and definitions for the various status designations.

Special Status Plants

Botanical surveys during 2002 and 2007 were limited in calculation capability on the Project site and throughout southern California due to prolonged drought. Many plant species in the Project region are either annual (i.e., complete their life cycles in a single year and then die) or perennial herbs (i.e., die back to the ground level each year and persist as underground bulbs or root crowns). In poor rainfall years, annual and perennial herbs may not have been visible, though they may have existed on site as an inactive seed, bulb, or root crown. Most of the special status plants in the Big Bear area are perennial herbs, making a conclusive determination of "presence" or "absence" based on field surveys difficult during low rainfall years. However, previous reports of presence and determination of habitat quality are helpful in estimating the probability of a special status plant species occurrence.

The White survey was conducted on three dates, April 30, June 7, and August 8, during the 2007 season. The 2007 precipitation season (measured from July 1 to June 30 annually) was a record drought year for the San Bernardino Mountains, with only 11.66 inches of precipitation recorded at Big Bear Dam, compared to an average annual precipitation of 36.00 inches. As a result of the drought conditions under which previous surveys had been conducted, Dr. Timothy Krantz performed Supplemental Focused Special Status Plant Species Survey on the Project site in 2008 and 2010, which were normal precipitation years. The 2008 precipitation year was average, with 35.29 inches through May 2008, and flowering of both annual and perennial species exhibited good anthesis. The Supplemental Focused Special Status Plant Species Surveys (2008 and 2010; see Appendix A) were able to confirm the presence and distribution of the plants in a normal rainfall year. A list of potential special status plant species located within the 2011 Alternative Project area and site are described within Table 2-2, below.

Table 2-2: Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Abronia nana ssp. *covillei* Coville's dwarf abronia	None	None	4	None; restricted to carbonates soils
Allium parishii Parish's onion	None	None	4	Low; above known elevation range
Antennaria marginata White-margined everlasting	None	None	2	None; outside of known geographic range (only local occurrences in Barton Flats area)
Arabis breweri var. *pecuniaria* San Bernardino rock-cress	None	None	1B	None; outside geographical range
Arabis dispar Pinyon rock-cress	None	None	2	None; outside known geographic range (only occurs on desert-facing slopes)
Arabis parishii Parish's rock-cress	None	None	1B	Observed
Arabis shockleyi Shockley's rock-cress	None	None	2	None; restricted to carbonates soils
Arenaria lanuginosa ssp. *saxosa* Rock sandwort	None	None	2	Moderate; marginally suitable habitat
Arenaria ursina Big Bear Valley sandwort	FT	C	1B	High; suitable habitat
Astragalus albens Cushenbury milk-vetch	FE	C	1B	None; no suitable habitat (carbonate soils)
Astragalus bicristatus Crested milk-vetch	None	None	4	High; suitable habitat
Astragalus lentiginosus var. *sierrae* Big Bear Valley milk-vetch	None	None	1B	High; suitable habitat
Astragalus leucolobus Big Bear Valley woollypod	None	None	1B	Observed
Atriplex parishii Parish's smallscale	None	None	1B	None; no suitable habitat (alkali sink)
Berberis fremontii Fremont's barberry	None	None	3	None; no suitable habitat (presumed extinct in Cushenbury area)
Botrychium crenulatum Scalloped moonwort	None	None	2	None; no suitable habitat (marshes, bogs)
Calochortus palmeri var. *palmeri* Palmer's mariposa lily	None	None	1B	Moderate; marginally suitable habitat
Calochortus plummerae Plummer's mariposa lily	None	None	1B	None; above known elevation range
Castilleja cinerea Ashy-Gray Indian Paintbrush	FT	None	1B	Observed

Table 2-2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Castilleja lasiorhyncha San Bernardino Mountain owl's clover	None	None	1B	High; suitable habitat
Dryopteris filix-mas Male fern	None	None	2	Low; local rarity; outside known range
Dudleya abramsii ssp. *affinis* San Bernardino Mountains dudleya	None	None	1B	Moderate; marginally suitable habitat
Erigeron breweri var. *jacinteus* San Jacinto Mountains daisy	None	None	4	None; below known elevation range
Erigeron parishii Parish's daisy	FT	None	1B	None; no suitable habitat (carbonate soils)
Erigeron unicaulis Limestone daisy	None	None	2	None; outside known geographic range (local reports erroneous)
Eriogonum foliosum Leafy buckwheat	None	None	1B	High; suitable habitat
Eriogonum kennedyi var. *austromontanum* Southern mountain buckwheat	FT	None	1B	Low; suitable habitat (see text)
Eriogonum ovalifolium var. *vineum* Cushenbury buckwheat	FE	None	1B	None; no suitable habitat (carbonate soils)
Eriophyllum lanatum var. *obovatum* Southern Sierra wooly sunflower	None	None	4	Low; margin of known geographic range
Fimbristylis thermalis Hot springs fimbristylis	None	None	4	None; no suitable habitat (alkaline meadows, hot springs)
Galium jepsonii Jepson's bedstraw	None	None	4	High; suitable habitat
Galium johnsttonii Johnston's bedstraw	None	None	4	High; suitable habitat
Gentiana fremontii Moss gentian	None	None	2	None; no suitable habitat
Gilia leptantha ssp. *leptantha* San Bernardino Mountains gilia	None	None	1B	Low (see text)
Helianthus nuttalli ssp. *parishii* Los Angeles sunflower	None	None	1A	None; presumed extinct, above known elevation range
Heuchura hirsutissima Shaggy-haired alum root	None	None	1B	Low; limited suitable habitat
Heuchura parishii Parish's alumroot	None	None	1B	Low; limited suitable habitat
Horkelia wilderae Barton Flats horkelia	None	None	1B	None; outside known geographic range, endemic to Barton Flats area
Hulsea vestita ssp. *parryi* Parry's sunflower	None	None	4	None; outside known geographic range (only occurs on desert-facing slopes)

Table 2-2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Hulsea vestita ssp. *pygmaea* Pygmy hulsea	None	None	1B	None; below elevation range
Ivesia argyrocoma Silver-haired ivesia	None	None	1B	Observed
Juncus duranii Duran's rush	None	None	4	High; suitable habitat
Lesquerella kingii var. *bernardina* San Bernardino Mountains bladderpod	FE	None	1B	None; no suitable habitat (carbonate soils)
Lewisia brachycalyx Short-sepaled lewisia	None	None	2	Moderate; limited suitable habitat
Lilium humbodtii ssp. *ocellatum* Ocellated Humboldt lily	None	None	4	None; above known elevation range
Lillium parryi Lemon lily	None	None	1B	None; no suitable habitat
Linanthus killipii Baldwin Lake linanthus	None	None	1B	High; suitable habitat
Malaxiis monohyllos ssp. *brachypoda* Adder's mouth	None	None	2	None; below known elevation range
Mimulus exiguus San Bernardino Mountain monkeyflower	None	None	1B	High; suitable habitat
Mimulus purpureus var. *purpureus* Purple monkeyflower	None	None	2	Observed
Monardella macrantha ssp. *hallii* Hall's monardella	None	None	1B	None; outside known geographic range
Navarretia peninsularis Baja navarretia	None	None	1B	Low; limited suitable habitat
Oxytheca caryophylloides Chickweed oxytheca	None	None	4	High; suitable habitat
Oxytheca parishii var. *cienegensis* Cienega seca oxytheca	None	None	1B	None; outside known geographic range
Oxytheca parishii var. *goodmaniana* Cushenbury oxytheca	FE	None	1B	None; no suitable habitat (carbonate soils)
Oxytropis oreophila Mountain oxytrope	None	None	2	None; below known elevation range
Perideridia parishii ssp. *parishii* Parish's yampah	None	None	2	Low; limited suitable habitat
Phacelia exilis Transverse Range phacelia	None	None	4	High; suitable habitat
Phacelia mohavensis Mojave phacelia	None	None	4	High; suitable habitat

Table 2-2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Phlox dolichantha Bear Valley phlox	None	None	1B	Observed
Poa atropurpurea San Bernardino bluegrass	FE	None	1B	Low; limited suitable habitat
Poliomintha incana Frosted mint	None	None	1A	None; no suitable habitat (dunes and sandy flats), above known elevation range
Polystichum kruckebergii Krukeberg's sword fern	None	None	4	None; limited suitable habitat, outside known geographic distribution
Populus angustifolia Narrow-leaved cottonwood	None	None	2	None; outside known geographic range
Pyrrocoma uniflora ssp. *gossypina* Bear Valley pyrrocoma	None	None	1B	Moderate; suitable habitat
Rupertia rigida Parish's rupertia	None	None	4	High; limited suitable habitat
Scutellaria bolanderi ssp. *austromntanum* Southern mountain skullcap	None	None	1B	None, outside known geographic range, above known elevation range
Sedum niveum Davidson's stonecrop	None	None	4	None; no suitable habitat (rock ledges and cliffs)
Selaginella asprella Bluish spike-moss	None	None	4	Low; limited suitable habitat
Senecio bernardinus San Bernardino butterweed	None	None	1B	Low; limited suitable habitat
Senecio ionophyllus Tehachapi ragwort	None	None	4	Low; limited suitable habitat
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	C	R	1B	Low; limited suitable habitat
Sidalcea pedata Bird's foot checkerbloom	FE	SE	1B	Low to moderate (see text); suitable habitat
Sphenopholis obtusata Prairie wedge grass	None	None	2	High; suitable habitat
Streptanthus bernardinus Laguna Mountains jewelflower	None	None	4	High; suitable habitat
Streptanthus campestris Southern jewelflower	None	None	1B	High; suitable habitat
Swertia neglecta Pine green-gentian	None	None	4	High; suitable habitat
Taraxacum californicum California dandelion	FE	None	1B	Low; limited suitable habitat
Thelypodium stenopetalum Slender-petaled thelypodium	FE	None	1B	None; no suitable habitat (alkaline meadows)
Trichostema micranthum Small-flowered bluecurls	None	None	4	High; suitable habitat

Table 2-2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Viola pinetorum ssp. *grisea* Grey-leaved violet	None	None	1B	Low; outside known geographic range

Status Definitions:

USFWS

FE: Species designated as endangered under the federal Endangered Species Act. Endangered = "any species in danger of extinction throughout all or a significant portion of its range."

FT: Species designated as threatened under the Federal Endangered Species Act. Threatened = "species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

FPE: Proposed for federal listing as Endangered.

FPT: Proposed for federal listing as Threatened.

C: Candidate for federal listing as Threatened or Endangered.

SOC: Species of Concern

CDFG

ST: Threatened = "a species that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this Act" (California Endangered Species Act).

SE: Endangered = "a species is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes."

R: Rare

C: Candidate for state listing as Threatened or Endangered.

CNPS

List 1A: Plants Presumed Extinct in California

List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere

List 2: Plants Rare, Threatened, or Endangered in California But More Common Elsewhere

List 3: Plants About Which We Need More Information- A Review List

List 4: Plants of Limited Distribution - A Watch List

As outlined within Table 2-2, eighty-one (81) special status plant species are known to occur in the Project region, 30 of which occur or have a moderate or higher potential to occur on the Project site. In addition, six of these special status plant species have been observed on the Project site. A brief description of these special status plant species are described bellow:

Parish's Rock-Cress (*Arabis parishii*). Parish's rock cress is a CNPS List 1B species that typically blooms from April to May. This perennial herb occurs in rocky, quartzite and clay, or sometimes carbonate soils in pebble plains, pinyon-juniper woodlands, and upper montane coniferous forests from approximately 3,900 to 8,000 feet above msl. It is endemic to the San Bernardino Mountains. A 2002 survey of the project site found the species was observed uncommonly in scattered patches throughout pebble plain and open Jeffrey pine forest on the project site during botanical surveys conducted in 2002 (White and Leatherman, 2002). A 2007 survey conducted by Scott White Biological Consulting, and a 2008 and 2010 Supplemental Focused Special Status Plant Species Survey conducted by Timothy Krantz Biological Consulting reaffirmed that no changes in the species location or size have occurred.

Big Bear Valley Woollypod *(Astragalus leucolobus)*. Big Bear Valley woollypod is a CNPS List 1B species that typically blooms from May to July. This perennial herb occurs in rocky soils of lower montane coniferous forest, pebble plain, pinyon-juniper woodland, and upper montane

coniferous forests from approximately 5,600 to 8,000 feet above msl. It is found in the San Bernardino, San Gabriel, San Jacinto, and Santa Rosa mountains. This species was observed throughout the Project site during botanical surveys conducted in 2002 (White and Leatherman, 2002). The 2007 White survey and 2008 and 2010 Supplemental Focused Special Status Plant Species Survey (Krantz, 2010) reaffirmed that no changes in the species location or size have occurred.

Palmer's Mariposa Lily *(Calochortus palmeri var. palmeri)*. Palmer's mariposa lily is a CNPS List 1B species that typically blooms between May and July. This perennial, bulbiferous herb occurs in mesic chaparral, lower montane coniferous forest, meadows, and seeps from approximately 3,200 to 7,200 feet above msl. It is a California endemic found in the South Coast and Transverse ranges in Kern, Los Angeles, Riverside, Santa Barbara, San Bernardino, San Luis Obispo, and Ventura counties. This species has a moderate potential to occur on-site; however, were not observed on the Project site during focused surveys conducted in 2002, 2007, 2008, or 2010.

Ashy-Gray Indian Paintbrush (*Castilleja cinerea*). Ashy-Gray Indian Paintbrush is a federally-listed Threatened and CNPS List 1B species. It is a root parasite on other plants, often parasitizing the Federally-listed Threatened southern mountain buckwheat and Wright's matting buckwheat. It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows, seeps, and open pinyon or Jeffrey pine forest from approximately 5,900 to 9,300 feet above msl and is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcomb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). Scott White identified two eastern occurrences of Ashy-Gray Indian Paintbrush in his 2007 botanical report, indicated as occurring north of (offsite) Lots 22, and 29-30-31 of the adjacent existing residential tract (White 2007). However, as discussed in the Krantz (2008) botanical report for the Moon Camp project site, the previous findings of Scott White (2007) were found to be erroneous with respect to identifying two occurrences of Ashy-Gray Indian Paintbrush habitat located in the southeast portion of the Project site.

All areas identified by White as containing Ashy-Gray Indian Paintbrush were re-visited during the Supplemental Focused Special Status Plant Species Survey (August 29, 2010), conducted during a year of normal rainfall. The primary focus of the Supplemental Focused Special Status Plant Species Survey (August 29, 2010) was to further delineate and quantify occurrences of Ashy-Gray Indian Paintbrush on the Project site. The 2010 survey confirmed that no occurrences of Ashy-Gray Indian Paintbrush existed at the two southeasterly sites, and the middle occurrence was confirmed as delineated in the Krantz 2008 survey. The general distribution of the westerly Ashy-Gray Indian Paintbrush occurrence was approximately the same as in both the White and Krantz (2008) surveys.

Findings and conclusions of the Supplemental Focused Special Status Plant Species Survey conducted by Dr. Krantz (August 29, 2010) with respect to the Ashy-Gray Indian Paintbrush at the Project site are described below.

Discrete Occurrences of Ashy-Gray Indian Paintbrush

Occurrences of Ashy-Gray Indian Paintbrush identified by Krantz (2008) were confirmed during the Supplemental Focused Special Status Plant Species Survey (August 29, 2010), including approximately 50 plants at the location at the rear of proposed Lots 47-48; nine plants at the rear of Lot 49; and three plants on the west bank of the swale at the rear of Lot 50. A recent large tree-fall above the swale may alter the exposure and drainage pattern immediately around the swale, but the three Ashy-Gray Indian Paintbrush plants were still observed at this location in 2010.

Open Space Lot A

Krantz conducted a discrete count of the Ashy-Gray Indian Paintbrush occurrences on Lot A by systematically walking the surrounding area of the knoll at this location. Altogether, a total of approximately 230 individual Ashy-Gray Indian Paintbrush occurrences were identified within the boundaries of Lot A.

Open Space Lot H

The newly-proposed Lot H Open Space Conservation Easement was created to protect the high densities of Ashy-Gray Indian Paintbrush occurring in this area. The highest concentration of these plants extends in a broad opening in the Jeffrey pine woodland, in association with Wright's matting buckwheat. A total of approximately 4,665 Ashy-Gray Indian Paintbrush occurrences were estimated to occur in this area based on a combination of discrete counts and a belt transect through the middle of the highest density area. Altogether, a total of 5,567 Ashy-Gray Indian Paintbrush plants were estimated to occur on the Moon Camp property. Permanent protection of Lot H results in preservation of 84 percent (4,665 plants of 5,567 plants) of the total Ashy-Gray Indian Paintbrush plants onsite.

Lots 1-5, Road Easement and Well Lot F

Discrete counts of Ashy-Gray Indian Paintbrush plants were conducted on Lots 1-5 of the revised Moon Camp subdivision, including the new Lots 1, 2, and 3. The new Lot 1 contains approximately 45 plants, all located within a 5m-radius of the southeast corner of the Project site. These plants are within the rear-lot and side-lot building setbacks, established for the 2011 Alternative Project. Therefore, although not protected by a conservation easement, these plants may not be disturbed by physical development of the lot.

Ashy-Gray Indian Paintbrush plants on the new Lot 2 are scattered across the Lot, with approximately 150 plants.

The new Lot 3 contains approximately 175 Ashy-Gray Indian Paintbrush plants. Lot 4 contains approximately 70 Ashy-Gray Indian Paintbrush plants to the front-center of the Lot, and another 20 plants to rear of the Lot (not in the buildable area of the Lot), for a total of approximately 90 plants; and Lot 5 contains approximately 30 plants and another approximately 40 Ashy-Gray Indian

Paintbrush plants are in the road right-of-way across the front of Lot 5. Well Site Lot F and the associated access road contain approximately 80 plants.

The total estimated numbers of Ashy-Gray Indian Paintbrush plants located within the proposed 2011 Alternative Project site are outlined within Table 2-3, below. In addition, the location of occupied Ashy-Gray Indian Paintbrush plants is located within Exhibit 2-2.

Table 2-3: Summary of Ashy-Gray Indian Paintbrush Occurrence on the Moon Camp Site

Lot Number	Total Plants
Lot 1	45
Lot 2	150
Lot 3	175
Lot 4	90
Lot 5	30
Lot 47	50
Lot 49	9
Lot 50	3
Lot A	230
Lot F	80
Road ROW*	40
Lot H	4,665
Total	5,567

Source: Supplemental Focused Special Status Plant Species Survey (August 29, 2010).
* ROW = Right of Way.

Redesign of the lot layout, as reflected in the 2011 Alternative Project, results in a significant increase in Ashy-Gray Indian Paintbrush conservation. Of the 5,567 Ashy-Gray Indian Paintbrush plants determined to occur on site through the updated plant surveys, 4,895 plants will be permanently protected within Lot A and H, representing 88 percent of the total number of Ashy-Gray Indian Paintbrush plants within the proposed Project site. Of the remaining Ashy-Gray Indian Paintbrush plants on private Lots, plants within Lots 1, 47, 49, and 50 are all within the rear Lot building setbacks, as well as 20 plants on Lot 4, for a total of 127 plants.

San Bernardino Mountains Dudleya *(Dudleya abramsii ssp. affinis)*. The San Bernardino Mountains dudleya is a CNPS List 1B species that typically blooms from April to June. This perennial herb occurs in granitic, quartzite, or carbonate soils of pebble plain, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,800 to 8,500 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be moderate.

Leafy Buckwheat (*Eriogonum foliosum*). Leafy buckwheat is a CNPS List 1B species that typically blooms from July to October. This annual herb occurs in sandy soils of chaparral, lower montane coniferous forest, and pinyon-juniper woodland from approximately 3,900 to 7,200 feet above msl. This species is found in scattered locations from Big Bear Valley south to Baja California. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Jepson's Bedstraw (*Galium jepsonii*). Jepson's bedstraw is a CNPS List 4 species that typically blooms from July to August. This rhizomatous, perennial herb occurs in granitic, rocky or gravelly soils in lower and upper montane coniferous forests from approximately 6,500 to 8,100 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Johnston's Bedstraw (*Galium johnstonii*). Johnston's bedstraw is a CNPS List 4 species that typically blooms from June to July. This perennial herb occurs in chaparral, lower montane coniferous forest, pinyon-juniper woodland, and riparian woodland from approximately 5,300 to 7,500 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Silver-Haired Ivesia (*Ivesia argyrocoma*). Silver-haired ivesia is a CNPS List 1B species that typically blooms between June and August. This perennial herb occurs in alkaline meadows and seeps, pebble plains, and upper montane coniferous forest from approximately 4,900 to 8,800 feet above msl. It occurs in the San Bernardino Mountains and a disjunct population occurs in the mountains of Baja California. This species was reported on the Project site by MBA and was observed on the Project site during the 2002, 2008 and 2010 botanical surveys.

Duran's Rush (*Juncus duranii*). Duran's rush is a CNPS List 4 species that typically blooms from July to August. It is a rhizomatous, perennial herb that occurs in mexic soils of lower montane coniferous forest, meadows and seeps, and upper montane coniferous forest from approximately 5,800 feet to 9,000 feet above msl. This species is found in the San Bernardino, San Gabriel, and San Jacinto mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Short-Sepaled Lewisia (*Lewisia brachycalyx*). Short-sepaled lewisia is a CNPS List 2 species that typically blooms from May to June. It is a perennial herb that occurs in mesic meadows and seeps, and lower montane coniferous forest from 4,500 to 7,500 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be moderate.

Baldwin Lake Linanthus (*Linanthus killipii*). The Baldwin Lake linanthus is a CNPS List 1B species that blooms from May to July. It is an annual herb that occurs in alkaline meadows and seeps, pebble plain, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,500 to 7,800 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

San Bernardino Mountain Monkeyflower (*Mimulus exiguus*). The San Bernardino Mountain monkeyflower is a CNPS List 1B species that typically blooms from June to July. It is an annual herb that occurs in mesic, clay soils of meadows and seeps, pebble plain, and upper montane coniferous forest between approximately 5,800 and 7,500 feet above msl. This species is found in the San Bernardino Mountains and high mountains of Baja California. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Purple Monkeyflower (*Mimulus purpureus var. purpureus*). Purple monkeyflower is a CNPS List 2 species that typically blooms from May to July. It is an annual herb that occurs in meadows and seeps, pebble plain, and upper montane coniferous forest from approximately 6,100 to 7,500 feet above msl. This species is found in the San Bernardino Mountains and high mountains of Baja California. The species was first observed on site during botanical surveys in 1988 and was later observed on the Project site, including within Lot "A", and along a draw on the eastern portion of the site, corresponding to Lot 50 (Krantz, 2008).

Chickweed Oxytheca *(Oxytheca caryophylloides).* Chickweed oxytheca is a CNPS List 4 species that typically blooms from July to September. It is an annual herb that occurs in sandy soils of lower montane coniferous forest from approximately 3,900 to 8,500 feet above msl. This species is found in the southern Sierra Nevada, Transverse Ranges, and San Jacinto Mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Parish's Yampah (*Perideridia parishii ssp. parishii*). Parish's yampah is a CNPS List 2 species that typically blooms from June to August. It is a perennial herb that occurs in lower and upper montane coniferous forests, and meadows and seeps above approximately 6,500 feet above msl. This species is found in the San Bernardino Mountains and in disjunct populations in Arizona and New Mexico. There is a low potential for this species to occur on site.

Transverse Range Phacelia (*Phacelia exilis*). The Transverse Range phacelia is a CNPS List 4 species that typically blooms from May to August. It is an annual herb that occurs in sandy or gravelly soils in lower and upper montane coniferous forests, and meadows and seeps from approximately 3,500 to 8,500 feet above msl. This species is found in the southern Sierra Nevada and Transverse Ranges. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Mojave Phacelia (*Phacelia mohavensis*). The Mojave phacelia is a CNPS List 4 species that typically blooms from April to August. It is an annual herb that occurs in sandy or gravelly soils of cismontane woodland, lower montane coniferous forest, meadows and seeps, and pinyon-juniper woodland from approximately 4,500 to 8,100 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Bear Valley Phlox (*Phlox dolichantha*). The Bear Valley phlox is a CNPS List 1B species that blooms from June to July. It is a perennial herb that occurs in pebble plain and upper montane coniferous forest from approximately 6,500 to 8,800 feet above msl. This species is endemic to the San Bernardino Mountains. Although restricted to Big Bear and Holcomb Valleys, its regional distribution extends up to the summit of Sugarloag Mountain south of Big Bear Valley and as far north as White Mountain, northwest of Holcomb Valley. The taxon is fairly common within its range and is not considered to be a high priority for formal listing or more formal protection (Krantz 2008). Krantz (2008) found the species to be rather widely distributed on the Project site in open black oak woodland and under Jeffrey pines.

San Bernardino Bluegrass (*Poa atropurpurea*). San Bernardino bluegrass is a Federally-listed Endangered and CNPS List 1B species that typically blooms from May to June. It is a rhizomatous, perennial herb that occurs in mesic meadows and seeps between approximately 4,800 and 7,200 feet above msl. This species is found in the San Bernardino and Laguna mountains (San Diego). The project site does not provide suitable habitat for this species and the potential to occur is considered to be low.

Bear Valley Pyrrocoma (*Pyrrocoma uniflora ssp. gosssypina*). Bear Valley pyrrocoma is a CNPS List 1B species that typically blooms from July to August. It is a perennial herb that occurs in meadows and seeps, and pebble plain from approximately 5,200 to 7,600 feet above msl. This species is endemic to the San Bernardino Mountains. The project site does not provide suitable habitat for this species and the potential to occur is considered to be low.

Parish's Rupertia (*Rupertia rigida*). Parish's rupertia is a CNPS List 4 species that typically blooms from June to July. It is a perennial herb that occurs in chaparral, cismontane woodland, and lower montane coniferous forest below approximately 8,100 feet above msl. This species is found in the San Bernardino Mountains, Peninsular Ranges, and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Prairie Wedge Grass (*Sphenopholis obtusata).* Prairie wedge grass is a CNPS List 2 species that typically blooms from April to July. It is a perennial herb that occurs in mesic soils of cismontane woodland, meadows and seeps between approximately 1,000 and 6,550 feet above msl. This species is found in a few widely scattered locations in Amador, Fresno, Inyo, Mono, Riverside, and

San Bernardino counties in California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Laguna Mountains Jewelflower (*Streptanthus bernardinus*). The Laguna Mountains jewelflower is a CNPS List 4 species that typically blooms from June to July. It is a perennial herb that occurs in chaparral, and lower montane coniferous forest between approximately 3,900 and 8,100 feet above msl. This species is found in the Transverse and Peninsular ranges and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Southern Jewelflower *(Streptanthus campestris*). The southern jewelflower is CNPS List 1B species that typically blooms from May to July. It is a perennial herb that occurs in rocky soils of chaparral, lower montane coniferous forest, and pinyon-juniper woodland from approximately 2,900 to 7,500 feet above msl. This species is known from fewer than twenty occurrences in Riverside, San Bernardino, and San Diego counties, and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Pine Green-Gentian (*Swertia neglecta)*. Pine green-gentian is a CNPS List 4 species that typically blooms from May to July. It is a perennial herb that occurs in lower and upper montane coniferous forests, and pinyon-juniper woodlands from approximately 4,500 to 8,100 feet above msl. This species is found in the South Coastal and Transverse ranges within Los Angeles, San Bernardino, and Ventura counties. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Small-Flowered Bluecurls (*Trichostema micranthum*). Small-flowered bluecurls is a CNPS List 4 species that typically blooms from July to September. It is an annual herb that occurs in mesic soils in lower montane coniferous forest and meadows and seeps from 6,500 to 7,500 feet above msl. This species is found in the San Bernardino Mountains and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Special Status Wildlife

Fifty-three (53) special status wildlife species are known to occur within the region, 22 of which have a moderate or high potential to occur within the Project site. Focused surveys for the bald eagle, California spotted owl, southwestern willow flycatcher, and southern rubber boa were conducted in the winter, spring, summer and fall of 2002. Additional focused surveys were conducted for the southwestern willow flycatcher and San Bernardino Mountains flying squirrel during spring and summer 2007. Two special status wildlife species (bald eagle and southern sagebrush lizard) have been observed on the Project site. A brief description of the special status wildlife species that were determined to have a moderate to high potential to occur on the Project site, as well as those species for which focused surveys were conducted, is provided below and summarized in Table 2-4.

Table 2-4: Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Invertebrates			
Euchloe hyantis ssp. *andrewsi* Andrews' marble butterfly	SOC	C	Low; above known elevation range, limited suitable habitat
Amphibians			
Ensatina escholtzii croceater Yellow-blotched salamander	SOC	SSC	Low; limited marginally suitable habitat
Ensatina escholtzii klauberi Large-blotched salamander	SOC	SSC	None; above known elevation range, outside known geographic range
Rana muscosa Mountain yellow-legged frog	FPE	SSC	None; no suitable habitat
Scaphiopus hamondii Western spadefoot toad	SOC	SSC	None; above known elevation range
Taricha torosa torosa Coast range newt	SOC	SSC	None; no suitable habitat, above known elevation range
Reptiles			
Anniella pulchra pulchra Silvery legless lizard	SOC	SSC	Low; above known elevation range
Charina bottae umbricata Southern rubber boa	SOC	ST	Low; limited suitable habitat
Cnemidophorus tigris multiscutatus Coastal western whiptail	SOC	C	Moderate; suitable habitat
Coleonyx variegatus abbotti San Diego banded gecko	SOC	C	None; above known elevation range, no suitable habitat
Diadophis punctatus modestus San Bernardino ringneck snake	SOC	C	Low; limited suitable habitat
Lampropeltis zonata parvirubra San Bernardino Mountain kingsnake	SOC	C	Moderate; marginally suitable habitat
Lichanura trivirgata roseofusca Coastal rosy boa	SOC	C	None; above known elevation range
Phrynosoma coronatum ssp. *blainvillei* San Diego coast horned lizard	SOC	SSC/P	None; above known elevation, lack of suitable habitat
Sceloporus graciosus vendenbergianus Southern sagebrush lizard	SOC	C	Observed
Salvadora hexalepis virgultea Coast patch-nosed snake	SOC	SSC	None; lack of suitable habitat, above known elevation
Thamnophis hammondii hammondii Two-striped garter snake	C	SSC	None; no suitable habitat
Birds			
Accipiter cooperii Cooper's hawk	C	SSC	Nesting: Moderate Foraging: High
Accipiter gentilis Northern goshawk	SOC	SSC	Nesting: None Foraging: Moderate

Table 2-4 (cont.): Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Accipiter striatus Sharp-shinned hawk	C	SSC	Nesting: None Foraging: High in winter
Aimophila ruficeps canescens Southern California rufous-crowned sparrow	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Amphispiza belli belli Bell's sage sparrow	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Aquila chrysaetos Golden eagle	C	SSC	Nesting: None Foraging: High
Asio otus Long-eared owl	C	SSC	Nesting: Low Foraging: Moderate
Buteo regalis Ferruginous hawk	SOC	SSC	Nesting: None Foraging: Low in winter
Circus cyaneus Northern harrier	C	SSC	Nesting: None Foraging: Low
Cypseloides niger Black swift	C	SSC	Nesting: None Foraging: Moderate
Dendroica petechia Yellow warbler	C	SSC	Nesting: None Foraging: Moderate
Elanus leucereus White-tailed kite	C	FP	Nesting: Low Foraging: Low
Empidonax traillii extimus Southwestern willow flycatcher	FE	SE	Nesting: Low Foraging: Moderate; rare migrant
Eremophila alpestris actia California horned lark	C	SSC	Nesting: None Foraging: None; above known elevation range
Falco columbaris Merlin	C	SSC	Nesting: None Foraging: Low
Falco mexicanus Prairie falcon	C	SSC	Nesting: None Foraging: Low
Falco peregrinus anatum American Peregrine falcon	C	FE	Nesting: None Foraging : Low
Haliaeetus leucocephalus Bald eagle		SE	Observed Observed
Lanius ludovicianus Loggerhead shrike	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Piranga flava Hepatic tanager	C	SSC	Nesting: Low Foraging: Low
Progne subis Purple martin	C	SSC	Nesting: Low Foraging: Low; local rarity
Strix occidentalis occidentalis California spotted owl	SOC	SSC	Nesting: Low/None observed during focused surveys Foraging: High/Observed in close proximity to project site
Vireo vicinior Gray vireo	C	SSC	Nesting: None Foraging: Low

Table 2-4 (cont.): Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Mammals			
Antrozus pallidus Pallid bat	C	SSC	Roosting: Low Foraging: Low
Euderma maculatum Spotted bat	SOC	SSC	Roosting: None Foraging: Moderate
Eumops perotis californicus California mastiff bat	SOC	SSC	Roosting: None Foraging: Low
Glaucomys sabrinus californicus San Bernardino Mountain flying squirrel	SOC	SSC	Breeding: Low Foraging: High
Myotis ciliolabrum Small-footed myotis	SOC	C	Roosting: Low Foraging: High
Myotis evotis Long-eared myotis	SOC	C	Roosting: High Foraging: High
Myotis lucifugus Occult little brown bat	SOC	SSC	Roosting: High Foraging: High
Myotis thysanodes Fringed myotis	SOC	C	Roosting: Low Foraging: Moderate
Myotis volans Long-legged myotis	SOC	C	Roosting: Moderate Foraging: Moderate
Myotis yumanensis Yuma myotis	SOC	C	Roosting: Low Foraging: Moderate
Onychomys torridus ramona Southern grasshopper mouse	SOC	SSC	None; no suitable habitat
Perognathus alticola alticola White-eared pocket mouse	SOC	SSC	None; presumed extinct locally
Plecotus townsendii townsendii Pacific western big-eared bat	SOC	SSC	Roosting: None Foraging: Moderate

Status Definitions:

USFWS

FE: Species designated as Endangered under the Federal Endangered Species Act. Endangered = "any species in danger of extinction throughout all or a significant portion of its range."

FT: Species designated as Threatened under the Federal Endangered Species Act. Threatened = "species likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range."

FPE: Proposed for federal listing as Endangered.

FPT: Proposed for federal listing as Threatened.

C: Candidate for federal listing as Threatened or Endangered.

SOC: Species of Concern

CDFG

SR: Rare = "a species is rare when, although not presently Threatened with extinction, it is in such small numbers throughout its range that it may become Endangered if its present environment worsens."

ST: Threatened = "a species that, although not presently Threatened with extinction, is likely to become an Endangered species in the foreseeable future in the absence of the special protection and management efforts required by this Act (California Endangered Species Act)."

SE: Endangered = "a species is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes."

SSC: Species of Special Concern.

FP: Fully Protected species are protected by special legislation and cannot be taken at any time.

P: Protected species are also protected by special legislation and can only be taken with a permit issued by the CDFG.

C: Candidate for state listing as Threatened or Endangered.

A brief description of the special status wildlife species that were determined to have a moderate to high potential to occur on the Project site, as well as those species for which focused surveys were conducted, is provided below:

Reptiles

Southern Rubber Boa (*Charina bottae umbbricata)*. The southern rubber boa is a Federal Species of Concern and State-listed Threatened species found in the San Bernardino and San Jacinto mountains at elevations between 4,900 and 7,900 feet above msl. The majority of the localities for this species are in a 10-mile long strip of the San Bernardino Mountains between Twin Peaks in the west to Green Valley in the east. Known locations for this species occur on the north-facing slopes immediately south of Big Bear Lake. This species usually occurs in moist woodlands and coniferous forests with deep, well developed soils. It is a burrower and also commonly makes use of rock out crops for hibernation. Large downed logs and a well-developed litter layer are considered important for cover and for maintaining soil moisture. Surveys for this species were conducted in the spring and summer of 2002. An additional assessment of the Project site was conducted during February 2007 by Dr. Glenn R. Stewart, PhD, Professor Eneritus of Zoology and Environmental Sciences, Cal Poly Pomona, a noted authority on the SRB (see Appendix A of this Revised and Recirculated Draft EIR No. 2). No southern rubber boas were encountered during surveys. Given the lack of historical records in the immediate vicinity of the Project site, the negative results of two independent focused survey techniques, and the assessment results of Dr. Stewart, the southern rubber boa has a low potential to occur on the Project site.

Coastal Western Whiptail (*Cnemidophorus tigris multiscutatus*). The coastal western whiptail is a Federal Species of Concern. It is a moderately large, slender lizard typically found in open scrub, chaparral, and woodland communities in semi-arid areas or where vegetation is sparse, from below sea level to 7,000 feet above msl. This species is restricted to the western coast of North America from Ventura County south through the northern two-thirds of the Baja California peninsula. The project site provides suitable habitat for this species; however, it is at the maximum elevation for this species and its potential to occur is considered to be moderate.

San Bernardino Mountain Kingsnake (*Lampropeltis zonata parvirubra*). The San Bernardino mountain king snake is a Federal Species of Concern that occurs in the San Jacinto, San Bernardino, and San Gabriel mountains. This species typically occurs in open stands of ponderosa pine, Jeffrey pine, Coulter pine, and/or black oak at elevations ranging from 4,500 to 6,500 feet above msl. This species occurs at higher elevations, but is less common. Partially shaded rock outcrops appear to be an important microhabitat element for refugia and basking sites. The project site provides marginally suitable habitat for this species and its potential to occur is considered to be moderate.

Southern Sagebrush Lizard (*Sceloporus graciosus vandenbergianus*). The southern sagebrush lizard is a Federal Species of Concern that occurs in open coniferous forests and shrubland above 3,000 feet above msl. Its known range extends from Mount Pinos south to Baja California. This

species inhabits mixed conifer forest, black oak woodlands, montane chaparral, and pinyon-juniper woodlands. This species was observed frequently on the Project site.

Birds

Cooper's Hawk (*Accipiter cooperii*). The Cooper's hawk is a State Species of Special Concern. Both resident and migratory populations exist in San Bernardino County. Wintering Cooper's hawks are often seen in wooded urban areas and native woodland communities. Preferred nesting habitats include riparian forests, mountain canyons, and oak woodlands. Cooper's hawks in the region prey on small birds and rodents that live in woodland and, occasionally, scrub and chaparral communities. Breeding residents have been observed in the vicinity of Big Bear Lake. The project site provides suitable foraging habitat, but a limited amount of nesting habitat for this raptor. Therefore, its overall potential to occur is considered to be high, although the potential for nesting is moderate.

Northern Goshawk (*Accipiter gentilis*). The northern goshawk is a Federal Species of Concern and State Species of Special Concern. Rare in southern California, goshawks have been observed during the breeding season only on Mount Abel, Mount Pinos, and in the San Bernardino and San Jacinto mountains. Breeding has not been documented in the San Bernardino Mountains, although goshawks have been observed near Big Bear Lake. Goshawks occur in a variety of coniferous forest communities, including ponderosa and Jeffrey pine, mixed conifer, white fire and lodgepole pine. Large snags and downed logs are believed to be important habitat elements because they increase the abundance of small- to medium sized birds and mammals composing this species prey base. Limited suitable foraging habitat is present on the Project site and the potential for this species is considered moderate for foraging, but no potential for nesting.

Sharp-shinned Hawk (*Accipiter striatus*). The sharp-shinned hawk is a State Species of Special Concern. This raptor is a fairly common winter visitor throughout southern California. It prefers woodland communities, but can also be found in virtually any habitat as it passes through the area during migration. The sharp-shinned hawk is a fairly common winter visitor in the Big Bear Lake vicinity, and its potential to occur for foraging is considered to be high. However, the Project site provides no nesting habitat for this raptor.

Golden Eagle (*Aquila chryysaetos*). The golden eagle is a State Species of Special Concern. This raptor is uncommon, but widely distributed throughout foothill, lower montane, and desert montane habitats in southern California. Golden eagles nest primarily on cliffs and hunt for rabbits and other small mammals in open habitats such as grasslands, oak savannas, and open shrublands. No nesting habitat is present on the Project site; however, the potential for foraging on the Project site is considered high.

Long-eared Owl (*Asio otus*). The long-eared owl is a State Species of Special Concern. It breeds and roosts in riparian forests and woodlands or other dense forest habitats. This owl forages at night in open habitats including marshes, grasslands, and agricultural fields. It occurs throughout North

America but is an increasingly rare breeder in southern California. The project site provides moderate suitable foraging habitat and limited nesting habitat, for this species.

Black Swift (*Cypseloides niger)*. The black swift is a State Species of Special Concern. It is known to breed in the San Gabriel Mountains, Mill Creek Canyon in the San Bernardino Mountains, and the San Jacinto Mountains. This species occurs in mountain and foothill canyons where it nests in rocky cliffs behind waterfalls. No suitable nesting habitat is present on the Project site; however, this project site could provide suitable foraging habitat and the potential for this species to forage on the Project site is considered moderate.

Yellow Warbler (*Dendroica petechia*). The western yellow-warbler is a California Species of Special Concern. This subspecies of yellow warbler that breeds in southern California is the western yellow warbler (*D.p. brewsteri*). This subspecies occurs in coastal areas from northwestern Washington south to western Baja California. In southern California, yellow warblers breed locally in riparian woodlands. The yellow warbler is an abundant migrant and would be expected to occur in spring and fall during migration. No suitable nesting habitat is present on the Project site; however, the potential for foraging migrants on the Project site is considered moderate.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*). The southwestern willow flycatcher is a federally- and State-listed endangered species. This subspecies has declined drastically due to a loss of breeding habitat and nest parasitism by brown-headed cowbirds. This species occurs in riparian habitats along rivers, streams, or other wetlands where dense growths of willows (*Salix* sp.), baccharis (*Baccharis* sp.), arrowweed (*Pluchea* sp.), tamarisk (*Tamarix* sp.), or other plants are present, often with a scattered overstory of cottonwood (*Populus* sp.). The potential for this species to occur on the Project site as a foraging migrant is considered to be high, but its potential to nest on the Project site is considered low. Surveys for this species were conducted in the spring and summer of 2002 and again in 2007. No breeding or individual southwestern willow flycatchers were detected during the surveys. Willows along the shoreline are patchy and lack the dense growth or willow thicket favored by this species as territorial or breeding habitat. Therefore, breeding southwestern willow flycatchers are not expected to occur on the Project site.

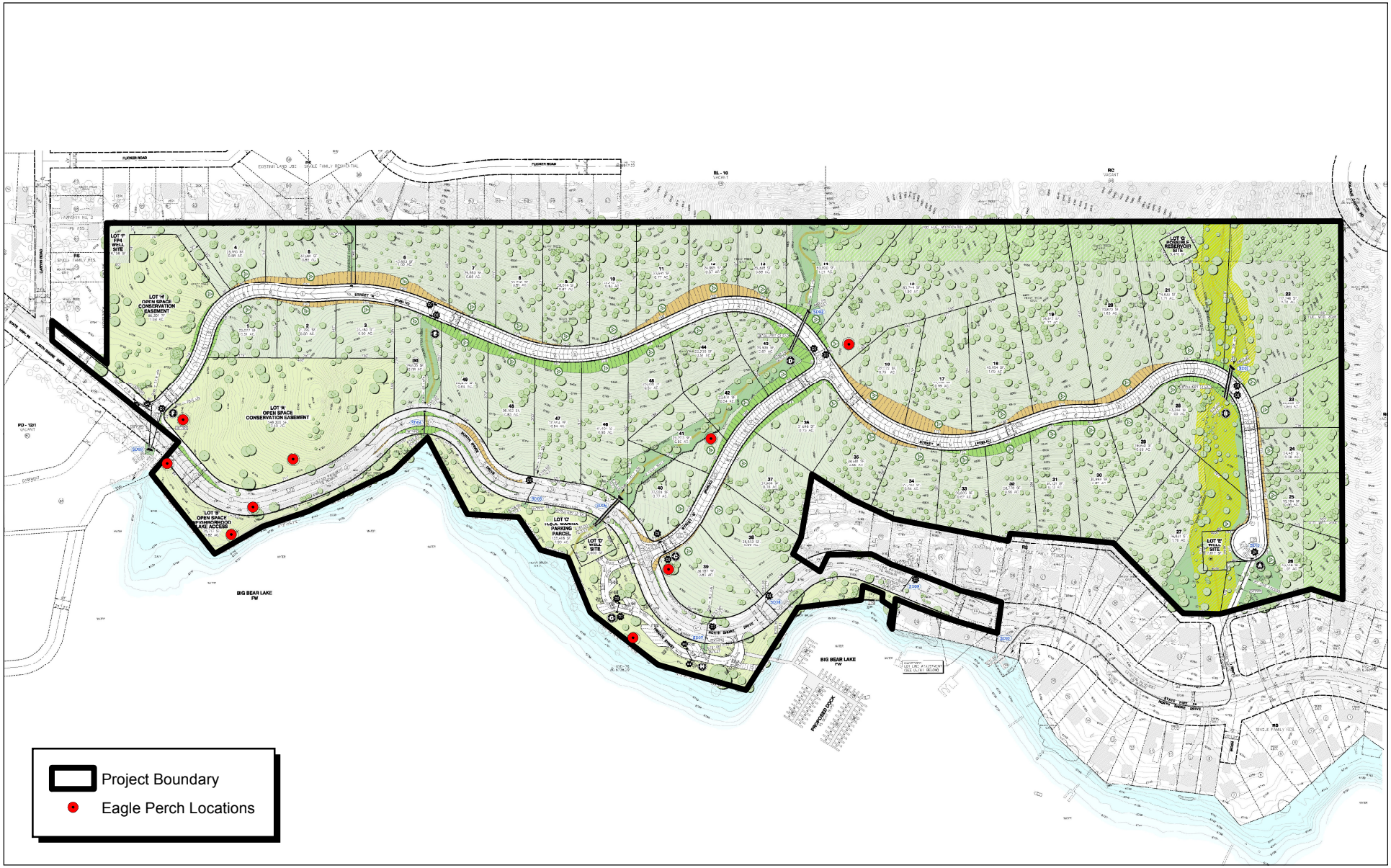
Bald Eagle (*Haliaeetus leucocephalus*). The bald eagle is a State-listed endangered species. This raptor typically overwinters in small numbers in southern California near lakes and reservoirs where they feed on fish, coots, and waterfowl. The largest known wintering population in southern California is at Big Bear Lake in the San Bernardino Mountains, where twenty to thirty eagles typically congregate from November to March. This species is known to be present on the Project site in winter and could potentially nest on the Project site. Surveys and records searches were conducted for the Project site in the winter of 2002 and 2007 to determine bald eagle use of perch trees and favored roosting locations (refer to Appendix A of this Revised and Recirculated Draft EIR). The surveys found that the site is used extensively by bald eagles. Bald eagle perch and roost locations were recorded and individual trees were marked with numbered tags. Tree perch locations

are shown on Exhibit 2-3. The records search confirmed extensive use of the Project site by bald eagles and found that the most commonly recorded use of a single tree was also on the Project site. In 2007 two bald eagle nests with potentially two pair of bald eagles were located in the Big Bear Lake area (Forest Service, June 25, 2007). One of the nests was located near Grout Bay, which is just west of the Project site.

California Spotted Owl (*Strix occidentalis occidentalis*). The California spotted owl is a Federal Species of Concern and State Species of Special Concern. This species occurs in all of the major mountain ranges in southern California, although some ranges support very few pairs. It is found at elevations ranging from below 1,000 feet to 8,500 feet above msl in mature forests typically with a dense, multi-layered canopy. Its prey base consists of woodrats (i.e., *Neotoma* spp.) and other rodents. Surveys were conducted for this species on the Project site in the spring and summer of 2002 (refer to Appendix A). Although one male spotted owl was detected approximately one mile to the northwest of the Project site, no nesting pairs or individuals were observed on the Project site. The San Bernardino National Forest has been conducting focused spotted owl surveys for the past several years and is monitoring the known breeding owls and territories which are located several miles north of the Project site in the dense conifer forest. Therefore, no nesting pairs presently occur on the Project site; however, individuals have a high potential to forage on the Project site

Mammals

Spotted bat (*Euderma maculatum).* The spotted bat is a Federal Species of Concern that occurs throughout much of the western United States, occupying a variety of habitats from arid deserts and grasslands through mixed conifer forests Because of the low frequency of their echolocation calls large open habitat is predicted to be preferred. Spotted bats roost in the small cracks found in cliffs and stony outcrops. They feed almost entirely on moths. The project site does not provide roosting habitat but it does provide potentially suitable foraging habitat for this species.



Source: Hicks & Hartwick, Inc. (December, 2010), Bon Terra Consulting (July, 2003), Tim Krantz (2008), Scott White & MBA.

NORTH

350 175 0 350

Feet

Michael Brandman Associates

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Exhibit 2-3
Eagle Perch Locations Map

SAN BERNARDINO COUNTY
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San Bernardino Mountain Flying Squirrel (*Glaucomys sabrinus californicus*). The San Bernardino Mountain flying squirrel is a Federal Species of Concern and State Species of Special Concern. It occurs in the San Bernardino Mountains between 5,200 and 8,500 feet above msl. This species prefers mid- to upper-elevation, dense, mature coniferous forest habitats, particularly those containing white fir. They use cavities in large trees, snags, and logs for cover. The project site provides suitable foraging habitat for this species and the potential for occurrence is considered high. The northeastern portion of the Project site provides potential nesting habitat as the forest in this area more dense with some portions having a closed canopy. This species was trapped in 1998 by the Forest Service approximately 0.5 mile north of the northern boundary of the Project site. A focused survey was conducted on the Project site in 2007 and resulted in negative findings.

Small-footed Myotis (*Myotis ciliolabrum*). The small-footed myotis is a Federal Species of Concern that occurs throughout much of the western United States, occupying a variety of habitats. This species feeds among trees or over brush, and roosts in cavities of cliffs, trees, or rocks and within caves or mine shafts. The project site provides potentially suitable roosting and foraging habitat for this species and the potential for occurrence is considered to be low for roosting and high for foraging.

Long-eared Myotis (*Myotis evotis*). The long-eared myotis is a Federal Species of Concern that is restricted to high-elevation habitats. It is known to occur in Coon Creek in the San Bernardino National Forest. This species can occur in a variety of habitats, but are usually associated with coniferous forests where they roost under exfoliating tree bark. The project site provides potentially suitable roosting and foraging habitat for this species and the potential for occurrence is considered to be high for foraging and roosting.

Occult Little Brown Bat (*Myotis lucifugus*). The occult little brown bat is a Federal Species of Concern and State Species of Special Concern that is restricted to high-elevation habitats. This species occurs in pine forests at elevations ranging from 6,000 to 9,000 feet above msl. It roosts in buildings, trees, and cliffs and feeds over water or open sites. The project site provides suitable roosting and foraging habitat and the potential for this species to occur is considered to be high for foraging and roosting.

Fringed Myotis (*Myotis thysanodes*). The fringed myotis is a Federal Species of Concern that is restricted to high-elevation habitats. This species has been observed on Arrastre Creek on the San Bernardino National Forest. It occurs in a wide variety of habitats but is most commonly found in dry pine or mixed conifer forests and pinyon-juniper woodlands where it will roost in caves, buildings, mine shafts, rock crevices in cliff faces, trees, and bridges. Hibernation has only been documented in buildings and mines. The project site provides marginally suitable roosting and foraging habitat for this species and potential for occurrence is considered to be moderate for foraging and low for roosting.

Long-legged Myotis (*Myotis volans*). The long-legged myotis is a Federal Species of Concern that is restricted to high-elevation habitats. This species has been observed on Arrastre Creek on the San Bernardino National Forest. It is primarily a bat of coniferous forests but also occurs seasonally in riparian and desert habitats. It uses abandoned buildings, cliff crevices, exfoliating tree bark, and hollows within snags as summer day roosts; caves and mine tunnels for hibernation. The project site provides marginally suitable foraging and roosting habitat for this species and its potential to occur on the Project site is considered to be moderate for foraging and roosting.

Yuma Myotis (*Myotis yumanensis*). The Yuma myotis is a Federal Species of Concern and a relatively small bat that occurs statewide. This species is closely associated with water and wooded canyon bottoms throughout its range. Caves and old buildings are preferred roosting habitats, with roosts numbering up to 2,000 individuals. The project site provides potentially suitable foraging habitat for this species and the potential for this species to forage on the Project site is considered to be moderate; however, this species is not expected to roost on the Project site.

Pacific Western Big-eared Bat (*Plecotus townsendii pallescens*). The Pacific western big-eared bat occurs throughout California and is a Federal Species of Concern and State Species of Special Concern. In the southern portion of the state, the subspecies, *P.t. pallescens*, occupies a variety of communities, including oak woodlands, arid deserts, grasslands, and high-elevation forests and meadows. Known roosting sites in California include mines, caves, and buildings. The project site would provide foraging habitat for this species and it has a moderate potential to forage on the Project site; however, no suitable roosting habitat is present.

Critical Habitat

The site is not located within any critical habitat designated areas for federally listed species.

Wildlife Movement

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (e.g., juvenile animals from natal areas, individuals extending range distributions); (2) seasonal migration; and (3) movements related to home range activities (e.g., foraging for food or water, defending territories, searching for mates, accessing breeding areas, or securing cover). A number of terms have been used in various wildlife movement studies, such as “travel route,” “wildlife corridor,” and “wildlife crossing” to refer to areas in which wildlife move from one area to another.

To clarify the meaning of these terms and to facilitate the discussion on wildlife movement in this analysis, these terms are briefly defined as follows:

- *Travel Route:* a landscape feature such as a ridgeline, drainage, canyon, or riparian strip within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g., water, food, cover, den sites).

- *Wildlife Corridor:* a piece of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another.
- *Wildlife Crossing:* a small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) established in 1918 the federal prohibition, unless permitted by regulations, to pursue, hunt, take, capture, or kill any migratory bird species or any part, nest, or egg of any such migratory bird species covered by the act. Impacts to any bird (or its nest) listed by the MBTA are considered punishable by fines and/or imprisonment. Additionally, impacts to nesting MBTA-listed species are considered a significant impact by Fish and Game Code per guideline Section 3513 and United States Code per guideline Sections 703 et seq.

Jurisdictional Waters

A Delineation of federal and State Jurisdictional Waters was prepared by RBF (Consulting (March 2002) in conjunction with the 2004 Draft EIR for several unnamed drainages located within the Project site. Prior to visiting the site, RBF conducted a review of U.S. Geological Survey (USGS) topographic maps (Quadrangle *Fawnskin, California*, dated 1996) and aerial photographs to identify areas that *may* fall under an agency's jurisdiction. United States Army Corps of Engineers (USACE) jurisdictional wetlands are delineated using the methods outlined in the USACE Wetland Delineation Manual (1987) based on hydrologic and edaphic features of the site, and on the vegetation composition of the site. Non-wetland waters of the United States (U.S.) are delineated based on the limits of the ordinary high water mark (OHWM) as determined by erosion, the deposition of vegetation or debris, and changes in the vegetation. Generally, CDFG takes jurisdiction to the bank of the stream/channels or to the limit of the adjacent riparian vegetation, whichever is greater. Analysis of the Project site consists of field surveys and verification of current conditions conducted in March 2002 (as outlined within the 2004 EIR).

Vegetation within the drainages of the Project site consisted of upland habitat, dominated by Jeffrey pines. Soils within the drainages were documented to be silty-sand (large grain). Soil samples taken on-site were generally dry and lacked characteristics of hydric soils (i.e., odor, streaking, mottling). No flow within the on-site drainages was observed during the March 15, 2002, field visit. However, evidence of an OHWM was observed within the drainages, primarily indicated by sediment deposits. It should also be noted that Big Bear Lake adjoins the Project site to the south. Based on discussions with the Big Bear Municipal Water District, the current water level of Big Bear Lake (as of May 27, 2009) is 6,738.1-feet above msl. The OHWM is reported to be 6,743.2 feet above msl.

Waters of the U.S. (Non-Wetland) Determination

Based on the results of the field observations and data collection, RBF identified 0.15-acre of Corps jurisdictional "waters of the U.S." within the Proposed Project site. The drainages are ephemeral. Utilizing the most current development plans, it was determined that roadway improvements would impact 0.04-acre of Corps jurisdiction.

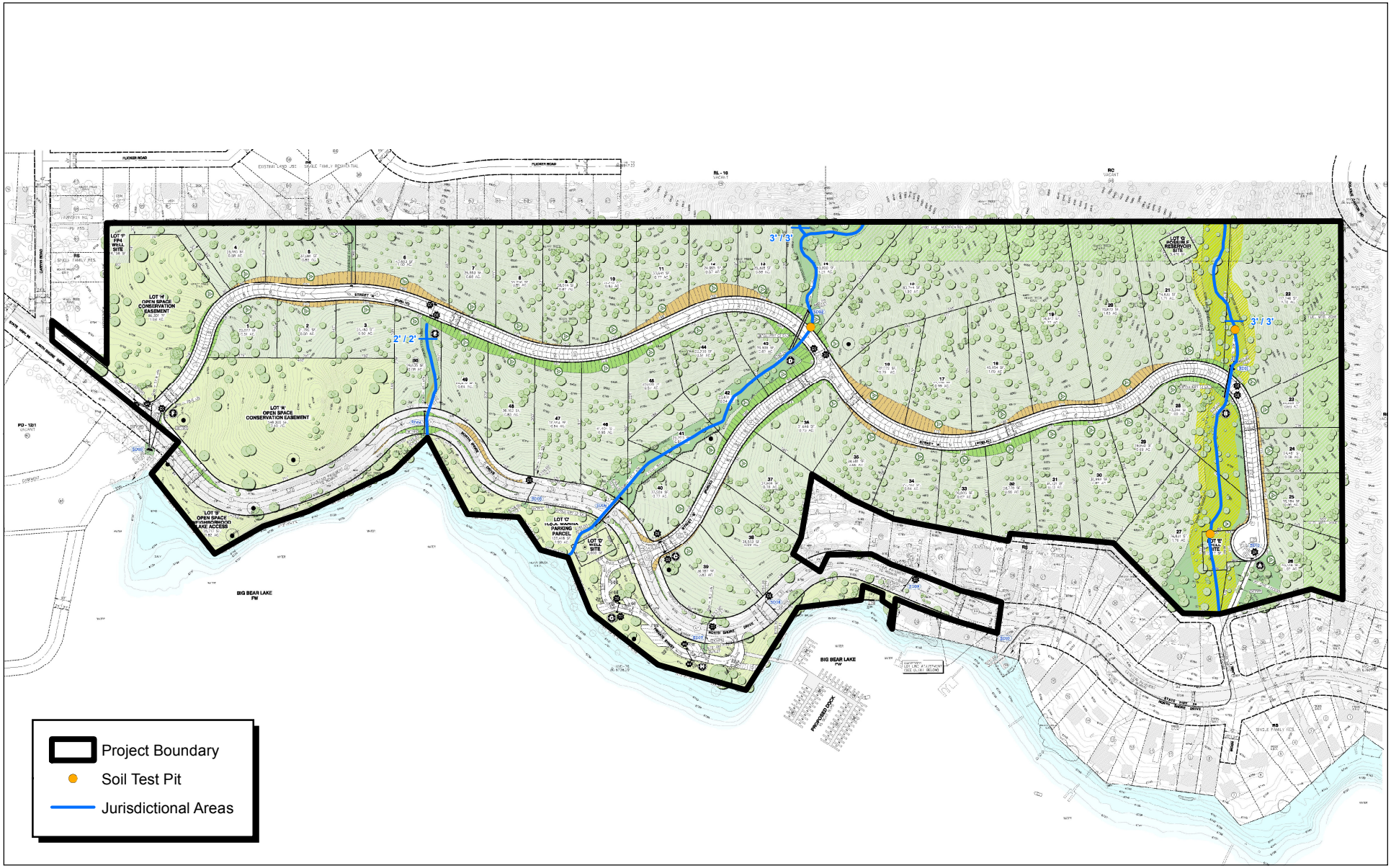
California Department of Fish and Game (1603) Jurisdiction

Based on the results of the field observations and data collection, RBF identified 0.15-acre of CDFG jurisdictional waters. Utilizing the most current development plans, it was determined that roadway improvements would impact 0.04-acre of CDFG jurisdiction.

2.1.4 - Regulatory Setting

This regulatory framework identifies the federal, state, and local statutes, ordinances, or policies that govern the conservation and protection of biological resources and must be considered during the decision-making process for projects that have the potential to affect biological resources. In this context, biological resources are defined to include the following:

- Any species identified as a federal candidate for listing, a sensitive species, or as having special status in local or regional plans, policies or regulations, by the CDFG or USFWS;
- Habitat designated as State Sensitive Habitats by the CDFG Natural Heritage Program;
- Wetlands or other "waters of the U.S." afforded protection pursuant to Section 404 of the Clean Water Act (CWA);
- Riparian or wetland habitats afforded protection pursuant to Section 1600 of the State Fish and Game Code (Code);
- Native resident or migratory wildlife corridors;
- Native wildlife nursery sites;
- Occupied nesting habitat for birds afforded protection pursuant to the MBTA; and
- Plant and wildlife habitats afforded protection pursuant to Habitat Conservation Plans (HCPs) and Natural Community Conservation Plans (NCCPs).



Source: Hicks & Hartwick, Inc. (December, 2010), Bon Terra Consulting (July, 2003), Tim Krantz (2008), Scott White & MBA.

NORTH

350 175 0 350

Feet

Michael Brandman Associates

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Exhibit 2-4
Jurisdictional Map

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Federal

Federal Endangered Species Act (FESA)

The purposes of this Act are to provide a means to conserve the ecosystems that endangered and threatened species depend on and to provide a program for conservation and recovery of these species. FESA defines species as "endangered" and "threatened" and provides regulatory protection for any species so designated. Section 9 of the FESA prohibits the take of species listed by the USFWS as threatened or endangered. As defined in the FESA, take means "...to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that take cannot always be avoided, Section 10(a) of the FESA includes provisions for take that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (incidental take permits) may be issued if taking is incidental and does not jeopardize the survival and recovery of the species in the wild.

Section 7(a)(2) of the FESA requires all federal agencies, including the USFWS, to evaluate the Project with respect to any species proposed for listing or already listed as endangered or threatened and their critical habitat, if any is proposed or designated. Federal agencies must undertake programs for the conservation of endangered and threatened species, and are prohibited from authorizing, funding, or carrying out any action that will jeopardize a listed species or destroy or modify its "critical habitat." As defined in the FESA, "individuals, organizations, states, local governments, and other non-Federal entities are affected by the designation of critical habitat only if their actions occur on federal lands, require a Federal permit, license, or other authorization, or involve federal funding."

Migratory Bird Treaty Act

The MBTA makes it unlawful to pursue, capture, kill, or possess or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union. As with the FESA, the MBTA authorizes the Secretary of the Interior to issue permits for incidental take.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act will continue to protect the bald eagle following delisting under FESA. Originally passed in 1940 to protect bald eagles, the Eagle Act was amended in 1962 to protect golden eagles as well, by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 U.S.C. 668(a); 50 CFR 22). "Take" includes pursue, shoot, shoot at, poison, would, kill capture, trap, collect, molest or disturb (16 U.S.C. 668(c); 50 CFR 22.3).

Section 404 of the Federal Clean Water Act

Section 404 of the Federal CWA, which is administered by the USACE, regulates the discharge of dredge and fill material into waters of the U.S. USACE has established a series of nationwide permits that authorize certain activities in waters of the U.S., provided that a proposed activity can

demonstrate compliance with standard conditions. Normally, USACE requires an individual permit for an activity that will affect an area equal to or in excess of 0.5 acre of waters of the U.S. Projects that result in impacts to less than 0.5 acre of waters of the U.S. can normally be conducted pursuant to one of the nationwide permits, if consistent with the standard permit conditions. However, USACE has discretionary authority to require an Environmental Impact Statement (EIS) for projects that result in impacts to an area 0.5 acre and above. Use of any nationwide permit is contingent on the activities having no impacts to endangered species.

State

Section 2080 and 2081 of the State Fish and Game Code

Section 2080 of the Code states that no person shall import into this state (California), export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission (State Fish and Game Commission) determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, the Native Plant Protection Act, or the California Desert Native Plants Act. Under Section 2081 of the Code, the CDFG may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or memoranda of understanding if: 1) the take is incidental to an otherwise lawful activity; 2) impacts of the authorized take are minimized and fully mitigated; 3) the permit is consistent with any regulations adopted pursuant to any recovery plan for the species; and 4) the applicant ensures adequate funding to implement the measures required by CDFG. CDFG shall make this determination based on the best scientific and other information that is reasonably available and shall include consideration of the species' capability to survive and reproduce.

Section 3503 of the State Fish and Game Code

Section 3503 of the Code states, "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto."

Section 1600 of the State Fish and Game Code

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California are subject to the regulatory authority of the CDFG pursuant to Sections 1600 through 1602 of the Code, requiring preparation of a Streambed Alteration Agreement. Under the Code, a stream is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Included are watercourses with surface or subsurface flows that support or have supported riparian vegetation. CDFG also has jurisdiction within altered or artificial waterways based on the value of those waterways to fish and wildlife, and also has jurisdiction over dry washes that carry water ephemerally during storm events.

Native Plant Protection Act

The Native Plant Protection Act includes measures to preserve, protect, and enhance rare and endangered native plants. The definition of "rare and endangered" differs from those contained in the California Endangered Species Act (CESA). However, the list of native plants afforded protection pursuant to this act includes those listed as rare and endangered under the CESA. The Native Plant Protection Act provides limitations on take as follows: "...no person will import into this State, or take, possess, or sell within this State" any rare or endangered native plant, except in compliance with provisions of the act. Individual land owners are required to notify the CDFG at least 10 days in advance of changing land uses to allow the CDFG to salvage any rare or endangered native plant material.

Natural Community Conservation Planning Program

The NCCP Program, initiated by Governor Pete Wilson in 1991 and managed by the CDFG, is designed to conserve multiple species and their habitats, while also providing for the compatible use of private land. Through local planning, the NCCP planning process protects wildlife and habitat before the landscape becomes so fragmented or degraded by development that listings are required under the FESA. Instead of saving small, disconnected units of habitat for just one species at a time, agencies, local jurisdictions, and other interested parties have an opportunity, through the NCCP, to work cooperatively to develop plans that consider broad landscapes, or "ecosystems," and the needs of many species. Partners enroll in the programs and, by mutual consent, habitat areas with high conservation values are set aside and may not be developed. Partners also agree to study, monitor, and develop management plans for these "reserve" areas. The program provides a process for fostering economic growth by allowing approved development in enrolled areas with lower conservation values.

Carbonate Plant Critical Habitat/San Bernardino Mountains Carbonate Habitat Management Strategy

On January 23, 2003, the USFWS designated critical habitat for five federally-listed plants on 13,180 acres of land in the San Bernardino Mountains. The five plants are Cushenbury milk-vetch (*Astragalus albens*), Cushenbury buckwheat (*Eriogonum ovalifolium var. vineum*), San Bernardino Mountains bladderpod (*Lesqueralla kingii ssp. bernardina)*, Cushenbery oxytheca (*Oxytheca parishii var. goodmaniana*), and Parish's daisy (*Erigeron parishii*). Critical habitat for these species covers 11,980 acres between the western edge of White Mountain and the eastern edge of Rattlesnake Canyon, 685 acres northeast of Big Bear Lake, and 515 acres of San Bernardino National Forest lands on Sugarlump Ridge south of Bear Valley. The project site is not located in any areas designated as critical habitat for these five carbonate plants. In addition, a Carbonate Habitat Management Strategy is currently being developed to address the long-term conservation of carbonate habitat in the San Bernardino Mountains. The strategy identifies potential and occupied carbonate habitat and actions to conserve carbonate plants. Plant surveys on the Project site have not identified any carbonate

habitat on the Project site that may be subject to conservation measures outlined in the Carbonate Habitat Management Strategy.

County

County of San Bernardino General Plan

The County of San Bernardino General Plan contains goals and policies/actions designed to preserve biological resources that apply to development within the County's jurisdiction. The general plan contains a list of Rare, Endangered and Threatened species that occur in San Bernardino County, adverse effects on which result in a mandatory finding of significant effect pursuant to State California Environmental Quality Act (CEQA) Guidelines, Section 15065 if individuals are adversely affected by County land use map changes and discretionary land use approvals, thereby requiring the preparation of an Environmental Impact Report (EIR). Listed plant species identified within the General Plan with potential to occur on the Project site include Parish's checkerbloom and bird's foot checkerbloom. Listed wildlife species identified within the General Plan with potential to occur on the Project site include the southern rubber boa and bald eagle.

County of San Bernardino Biotic Resources Overlay District

The project site lies within a County of San Bernardino Biotic Resources (BR) Overlay District. The purpose of the BR Overlay District is to "implement General Plan policies regarding the protection and conservation of beneficial rare and endangered plants and animal resources and their habitats which have been identified within unincorporated areas of the county" (Article 2, 85.030201). The County General Plan implements the intent of the BR Overlay District by requiring all proposed land uses with a minimum of 25 percent of the total proposed development area within the BR Overlay District to prepare a biological technical report identifying impacts to biological resources and mitigation measures designed to reduce or eliminate Project related impacts.

Plant Protection and Management Ordinance – County of San Bernardino Development Code

The County of San Bernardino requires under Chapter 8, Division 9 of the County Development Code (Plant Protection and Management) that development on all private and public lands within the unincorporated areas of San Bernardino County is subject to specific requirements. Removal of any native plant from unincorporated areas of San Bernardino requires the approval of a removal permit. Additionally, the following sections of the ordinance would apply to native plants on the Project site:

89.0110(b) The provisions of this Division shall not authorize the removal of perch trees within identified American bald eagle habitat.

89.0115(c) The reviewing authority may require certification from an appropriate tree expert or native plant expert that such tree removals are appropriate, supportive of a healthy environment and are in compliance with the provisions of this chapter.

89.0205 Any coniferous tree or portion thereof, including stumps, shall be treated in accordance with one of the methods specified in the County of San Bernardino Development Code Sections 89.0205 and 89.0210 within fifteen (15) days after such a tree or portion of such a tree has been cut.

2.1.5 - Thresholds of Significance

The following criteria for establishing the significance of potential impacts on biological resources were derived from Appendix G of the CEQA Guidelines. A significant impact would occur if a Project:

a) Has a substantial adverse effect, through either direct or indirect modification of potentially suitable or occupied habitat, or direct take, to any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS;

b) Has an adverse effect on existing riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS;

c) Has a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

d) Interferes substantially with the movement of any native resident or migratory fish or wildlife species or with established native, resident, or migratory wildlife corridors or impedes the use of native wildlife nursery sites;

e) Conflicts with regional policies or other local policies or ordinances protecting biological resources; and

f) Conflicts with approved local, regional, or state habitat conservation plans.

2.1.6 - Project Impact Analysis

Sensitive Plant Communities

Pebble Plain like Soils. Approximately 1,511 acres of pebble plain are known to exist in the San Bernardino Mountains (Krantz, 2008), 60 percent (906 acres) of which occurs on public lands. In addition, according to the 2008 Supplemental Focused Special Status Plant Species Survey indicated that Pebble plain soil conditions occurred on approximately 0.69 acres of the Project site, north of State Route 38 (SR-38). The report stated that it appeared as a distinct open patch within open Jeffrey pine forest in the western portion of the Project site and that the substrate in this area consisted of clay soil mixed with quartzite pebbles and gravel that were continually pushed to the surface through frost action. However, a Supplemental Focused Special Status Plant Species Survey (August 29, 2010) was conducted to respond to concerns raised in comments received on the Revised and Recirculated Draft EIR No. 1. The Supplemental Focused Special Status Plant Species Survey (August 29, 2010) concludes that the prior biological surveys mischaracterized the 0.69 acre portion of the Project site as

true pebble plain. As discussed in the Supplemental Focused Special Status Plant Species Survey (August 29, 2010), the area previously classified as pebble plain habitat is not actually pebble plain due to the lack of the two key indicator species. The 2010 Supplemental Focused Special Status Plant Species Survey findings augment the Supplemental Focused Special Status Plant Species Survey conducted by Dr. Krantz, dated June 29, 2008, providing an additional above-average precipitation year for observation. Therefore, based on the findings of the 2010 Supplemental Focused Special Status Plant Species Survey, no true pebble plain habitat exists, and the implementation of the 2011 Alternative Project will not result in a potentially significant impact due to impacts to this area of the Project. However, even if true pebble plain habitat existed on site and was adversely impacted by development of the Project, Mitigation Measure BR-1a would mitigate such impacts.

Mitigation Measure BR-1a requires permanent conservation of a 10-acre parcel, known as the Dixie Lee Lane parcel that contains high quality pebble plain habitat. Although Mitigation Measure BR-1a is intended to mitigate impacts to the Ashy-Gray Indian Paintbrush, the existence of high quality pebble plain habitat on that property would lessen any project impacts to the extent they occurred. According to the Supplemental Focused Special Status Plant Species Survey (August 29, 2010), the 10-acre Dixie Lee Lane pebble plain is estimated to contain very high densities of the two indicator species *Arenaria ursina* and *Eriogonum kennedyi austromontanum*, with an estimated population in the tens of thousands. Moreover, Dr. Krantz characterized the Dixie Lee Lane property as a "textbook example of this rare plant community." Dr. Krantz further opined that, to the best of his knowledge, the Dixie Lee Lane property represents the highest density of pebble plain plant species of any privately held land in Big Bear Valley. The 2011 Alternative Project proposes to implement Mitigation Measure BR-1a to conserve the 10-acre Dixie Lee Lane pebble plain, ultimately preserving the very high densities of the two indicator species. Accordingly, the 2011 Alternative Project will have a less than significant impact on pebble plain habitat.

Special Status Plant Species Known to Occur on the Project Site

One Federally-listed Threatened and CNPS List 1B species, Ashy-Gray Indian Paintbrush; and five CNPS List 1B species, Parish's rock cress, Big Bear Valley woollypod, silver-haired ivesia, purple monkeyflower, and Bear Valley phlox, were observed on the Project site during the 2002, 2007, 2008, and 2010 Supplemental Focused Special Status Plant Species Survey. The surveys identified an herbaceous layer of Wright's matting buckwheat (in the western half of the Project site) and found inclusions of Ashy-Gray Indian Paintbrush and Parish's rock cress throughout an approximate 18.01-acre area of open Jeffrey pine forest. Silver haired ivesia was found to be concentrated entirely within the Project site's mapped pebble plain habitat. Bear Valley woollypod was found in patches scattered throughout Jeffrey pine forest habitat on the Project site. Purple monkeyflower was found to be widely distributed on the pebble plain-like soils conditions in the conservation area, with a small portion of the population extending down the draw to the east into the southern half of proposed Lot 50. Finally Bear Valley phlox was found to be distributed in the open black oak woodland and under Jeffrey pines.

Development of the 2011 Alternative Project has the potential to significantly impact the aforementioned special status plant species. In addition to protecting the most exemplary and best quality habitat on-site (located within the newly-proposed Lot H Open Space Conservation Easement), all five of the CNPS List 1B status species observed on-site will be protected through Mitigation Measures BR-1b, BR-1d and BR-12 which provide for the establishment and management of conservation area encompasses the location of these plants.

Ashy-Gray Indian Paintbrush

As concluded within the Supplemental Focused Special Status Plant Species Survey (August 29, 2010), approximately 5,567 Ashy-Gray Indian Paintbrush occurrences are located within the proposed Project site. Of the 5,567 occurrences, 4,895 will be permanently protected within the Open Space Conservation Easement of Lot A and H, representing 88 percent of the total occurrences of Ashy-Gray Indian Paintbrush within the proposed Project site. Of the remaining Ashy-Gray Indian Paintbrush plants within the boundaries of private Lots, plants within Lots 1, 47, 49, and 50, are all within the rear Lot building setbacks, as well as 20 plants on Lot 4, for a total of 127 plants.

Discrete counts of Ashy-Gray Indian Paintbrush occurrences were also conducted on Lots 1-5 of the revised Moon Camp subdivision, including the new Lots 1, 2, and 3. The new Lot 1 contains approximately 45 plants, all located within a 5 (five) meter radius of the southeast corner of the property, within the rear-lot and side-lot building setbacks. In addition, Ashy-Gray Indian Paintbrush plants on the new Lot 2 are scattered across the Lot, with approximately 150 plants.

The new Lot 3 contains approximately 175 plants. Lot 4 contains approximately 70 plants to the front-center of the Lot, and another 20 plants to rear of the Lot, within the required building setback, for a total of approximately 90 plants; and Lot 5 contains approximately 30 plants and another approximately 40 Ashy-Gray Indian Paintbrush plants are in the road right-of-way across the front of Lot 5. Well Site Lot F and the associated access road contain approximately 80 plants. In total, the 2011 Alternative Project will impact approximately 672 occurrences of Ashy-Gray Indian Paintbrush occupying approximately 1.55 acres. Based on the foregoing, the reconfiguration of the 2011 Alternative Project and creation of permanent conservation easements covering the areas designated as Lot H and Lot A will permanently conserve approximately 88 percent of the Ashy-Gray Indian Paintbrush occurrences on the Project site (4,895 occurrences conserved, compared to 672 impacted occurrences). This onsite conservation of Ashy-Gray Indian Paintbrush occurrences results in mitigation for 2011 Alternative project impacts at more than a 7:1 ratio.

Additionally, Mitigation Measure BR-1a requires permanent conservation of the 10 acre, off-site, Dixie Lee Lane parcel that acts as further mitigation for impacts to the Ashy-Gray Indian Paintbrush. These 10 acres of pebble plain are private land located at the northern terminus of Dixie Lee Lane in the Sugarloaf area of Big Bear Valley. The 10 acres are fenced and exhibit very high densities of the two indicator species (*Arenaria ursina* and *Eriogonum kennedyi austromontanum*). Implementation of Mitigation Measure BR-1a will conserve the high quality pebble plain that is one of the best

remaining examples of pebble plain habitat in private ownership and will protect the high density of pebble plain soil conditions. As indicated in the Supplemental Focused Special Status Plant Species Survey (August 29, 2010) performed by Dr. Krantz, the 10 acre parcel comprises habitat that can support the Ashy-Gray Indian Paintbrush and, in fact, during the survey, multiple occurrences of this plant species were observed. Accordingly, in addition to formal conservation of 88 percent of the Ashy-Gray Indian Paintbrush occurrences on the Project site, through conservation easements covering Lot H and Lot A, permanent preservation of the 10 acre Dixie Lee property will provide further mitigation for impacts to the Ashy-Gray Indian Paintbrush species. With the preservation of the Dixie Lee Lane property, the 2011 Alternative Project will permanently set aside 15.38 acres of Ashy-Gray Indian Paintbrush occupied habitat. On an acreage basis, the 2011 Alternative Project is mitigating impacts on an approximately 10:1 basis.

The on-site preservation of 88 percent of Ashy-Gray Indian Paintbrush occurrences and implementation of Mitigation Measures BR-1a through BR-1d will reduce impacts to the Ashy-Gray Indian Paintbrush to less than significant levels.

Special Status Plant Species Potentially Occurring on the Project Site

Special status plants known to occur on the Project site are described in the preceding sub-section. As outlined within focused surveys and reports conducted in 2002, 2007, 2008, or 2010, various special-status plants could potentially occur on the Project site. Based upon location and site characteristics, six listed threatened or endangered species could potentially occur on the Project site. These include bird's foot checkerbloom (endangered), San Bernardino bluegrass (endangered), California dandelion (endangered), Big Bear Valley sandwort (threatened), southern mountain buckwheat (endangered), and slender-petalled thelypodium (endangered). In addition, 26 CNPS List 1B or 2 species could potentially occur on the Project site. See below for a list of special-status plants that could potentially occur on the Project site:

- Rock sandwort;
- Big Bear Valley milk vetch;
- Palmer's mariposa lily;
- San Bernardino Mountain owl's clover;
- Male fern;
- San Bernardino Mountains dudleya;
- Leafy buckwheat;
- San Bernardino Mountain gilia;
- Shaggy-haired alum root;
- Parish's alumroot;
- Short-sepaled lewisia;
- Lemon lily;
- Baldwin Lake linanthus;
- San Bernardino Mountain monkeyflower;
- Purple monkeyflower;
- Baja navarretia;
- Parish's yampah;
- Bear Valley phlox;
- Bear Valley pyrrocoma;
- San Bernardino butterweed;
- Prairie wedge grass;
- Southern jewelflower; and
- Grey-leaved violet.

According to the Supplemental Focused Special Status Plant Species Survey conducted by Dr. Krantz (2008), no endangered, threatened, or special-status plant species were identified on the Moon Camp property, and the potential for any occurrence of such species is considered to be extremely low. In addition, impacts to CNPS List 1B or 2 species special status plants, not listed as threatened or endangered (Section IV. B.4.) do not meet the County's CEQA threshold for a potentially significant impact. Therefore, impacts in this regard will be less than significant.

Special Status Wildlife Species

The 2011 Alternative Project would result in the loss of potential habitat for several special status wildlife species found onsite or potentially present on the Project site. For those species expected to occur, potential impacts were evaluated for the habitat that the species is expected to occupy.

Reptiles

Implementation of the 2011 Alternative Project may result in impacts on special status reptile species. One federal Species of Concern, the southern sagebrush lizard, has been observed on the Project site. Four additional species that are federal Species of Concern and/or State Species of Special Concern have potential to occur on the Project site. These species are the silvery legless lizard, coastal western whiptail, San Bernardino ringneck snake, and San Bernardino Mountain kingsnake. The loss of potential habitat and species would be considered potentially significant because development of the 2011 Alternative Project could substantially diminish habitat for wildlife in the region and reduce specific populations of reptile species of concern in the region to below self-sustaining numbers. However, mitigation measures BR-2 through BR-8 will reduce these impacts to special status wildlife species to a level of less than significant.

In addition, intensive surveys for the State-listed Threatened southern rubber boa were conducted on the Project site in the spring and summer of 2002 and an additional assessment was conducted by Dr. Glenn Stewart, PhD, Professor Emeritus of Zoology and Environmental Sciences, Cal Poly Pomona, in February 2007. Given the negative results of two independent focused survey techniques, the results of Dr. Stewart's assessment, and the lack of historical records in the immediate vicinity of the Project site, the survey report concluded that this species has a low potential to occur on the Project site.

Birds

2011 Alternative Project implementation may result in impacts on special status bird species. Nineteen sensitive bird species (Federal Species of Concern, State Endangered Species and State Species of Special Concern) occur or have the potential to occur on the Project site and are discussed below.

Bald Eagle. The bald eagle was taken off the federal list of threatened species, but remains on the State endangered species list. Small wintering populations of bald eagle often occur in scattered mountain locations in the region. Big Bear Lake supports the largest wintering population of bald

eagle in southern California and may include as many as 30 individuals in peak years. The bald eagle was observed using several trees on the Project site for perch and roost locations. A records search also demonstrated that some of the most utilized perch and roost trees on the north shore of the lake are located on the Project site. Given the limited distribution of wintering populations of bald eagles in southern California, removal of these trees and/or construction of uses in proximity to trees are considered a significant impact. Therefore, any construction activities in proximity to the identified perch and most trees are considered by the County as a significant impact under CEQA. Two pair of bald eagles were documented nesting at Big Bear during Spring/Summer 2007. As the bald eagle has recently nested at Big Bear, ongoing surveys of the Project site during breeding season is recommended to verify the continued absence of nesting bald eagles on the Project site.

Mitigation measures BR-4, B-6 and B-7 will reduce identified impacts to the bald eagles potentially occurring on the Project site. Although Mitigation Measures BR-4, B-6 and B-7 will reduce impacts to the bald eagle, implementation of the 2011 Alternative Project will directly impact eagle perch locations. Based on the County of San Bernardino criteria for determining impacts to bald eagles, any removal of perch trees or human activity resulting in light and/or noise impacts are considered a significant impact under CEQA. This threshold is so restrictive that there is no reasonable configuration to the 2011 Alternative Project that could avoid a significant impact to the bald eagle. Therefore, further project modifications would not avoid or substantially reduce the identified impacts to bald eagles. Therefore, impacts in this regard will remain significant and unavoidable.

Cooper's Hawk, Northern Goshawk, Sharp-shinned Hawk, Golden Eagle, Long-eared Owl, Ferruginous Hawk, Northern Harrier, White-tailed Kite, Merlin, American Peregrine Falcon, Osprey, Prairie Falcon, and California Spotted Owl. 2011 Alternative Project implementation would reduce the amount of foraging habitat for these species. This impact would contribute to the cumulative loss of foraging habitat for these raptor species. However, the loss of potential foraging habitat for these species would be considered adverse, but less than significant due to the limited amount of habitat loss relative to the availability of foraging habitat for these species in the San Bernardino Mountains and National Forest.

The Cooper's hawk, long-eared owl, white-tailed kite, and California spotted owl also have potential to nest on the Project site. If an active raptor nest (common or special status species) were found on the Project site, the loss of the nest would be considered a violation of the California Fish and Game Code Sections 3503, 3503.5, and 3513. The loss of any active raptor nest occurring on the Project site would be considered significant.

Mitigation measures BR-4, B-6 and B-7 will be imposed on the 2011 Alternative Project to minimize impacts to these species. Compliance with these mitigation measures would reduce potential impacts to these species to a level of less than significant.

Black Swift, Yellow Warbler, Hepatic Tanager, Purple Martin, and Gray Vireo. 2011 Alternative Project implementation would reduce the amount of foraging habitat for these species. In addition, the hepatic tanager and purple martin have potential to nest on the Project site and implementation of the 2011 Alternative Project may impact active nests. The loss of potential habitat for these species would be considered adverse, but less than significant due to the limited amount of habitat loss relative to the availability of habitat for these species in the San Bernardino Mountains and National Forest.

Mammals

2011 Alternative Project implementation may result in impacts on special status mammal species. No federally- and/or State-listed species have been observed on the Project site. However, 11 Federal Species of Concern and/or State Species of Special Concern have potential to occur on the Project site and are discussed below.

Pallid Bat, Spotted Bat, Small-Footed Myotis, Long-Eared Myotis, Occult Little Brown Bat, Fringed Myotis, Long-Legged Myotis, Yuma Myotis, and Pacific Western Big-Eared Bat. The project site provides suitable foraging habitat for these bat species. 2011 Alternative Project implementation would reduce the amount of foraging habitat for these species. The pallid bat, small-footed myotis, long-eared myotis, Occult little brown bat, fringed myotis, long-legged myotis, and Yuma myotis, also have potential to roost on the Project site. This impact would contribute to the cumulative loss of foraging and roosting habitat for these bat species. However, the loss of potential habitat for these species would be considered adverse, but less than significant, due to the limited amount of habitat loss relative to the availability of foraging and roosting habitat for these species in the San Bernardino Mountains and National Forest.

San Bernardino Mountain Flying Squirrel. Although focused surveys for the flying squirrel were negative, the Project site provides suitable foraging and breeding habitat for this species. 2011 Alternative Project implementation would impact habitat for this species. However, the loss of potential habitat would be considered adverse, but less than significant, due to the limited amount of habitat loss relative to the availability of habitat for this species in the San Bernardino Mountains and National Forest.

Direct Impacts

Flora and Vegetation Type Impacts

A total of 57.05 acres of native and non-native vegetation types, including developed areas, would be impacted by the 2011 Alternative Project.

Jeffrey Pine Forest

A total of 50.72 acres of Jeffrey pine forest, including 13.81 acres of open Jeffrey pine forest, would be impacted by the 2011 Alternative Project implementation. Approximately 58,526 acres of Jeffrey pine forest occurs in the San Bernardino National Forest and 141,604 acres in the Cleveland, San

Bernardino, Angeles and Los Padres National Forests collectively. Approximately 4.2 acres of open Jeffrey pine forest will be permanently preserved by a conservation easement. Impacts on this vegetation type would be considered less than significant since this vegetation type is common throughout the San Bernardino Mountains and other mountain ranges in the region.

Lake Shoreline

According to the 2004 Draft EIR, a total of 4.0 acres of ruderal lake shoreline would be impacted by the 2011 Alternative Project. Man-made lakes are essentially distinct ecosystems, with an aquatic fauna and flora that bears little resemblance to what naturally occurs in the streams that formed them. However, a Supplemental Focused Special Status Plant Species Survey (August 29, 2010) was conducted by Timothy Krantz, PhD to address comments submitted by concerned parties with regard to the Revised and Recirculated Draft EIR No. 2 for the Moon Camp 50-Lot Residential Subdivision, Tentative Tract 16136. The findings within both the 2008 and 2010 Supplemental Focused Special Status Plant Species Survey concluded that although there are some scattered occurrences of indicator plant species, wet meadow habitat no longer occurs along the shoreline portion of the Project site. This sensitive habitat has been replaced with mostly ruderal species and should be characterized as ruderal shoreline habitat. Therefore, impacts in this regard will be less than significant.

Developed

A total of 2.82 acres of disturbed vegetation in developed areas (SR-38) would be impacted by 2011 Alternative Project implementation. Impacts on this vegetation type would not be considered significant since this vegetation type is considered to have a low biological value.

Wildlife Impacts

The loss of habitat, loss of wildlife, wildlife displacement, and habitat fragmentation that would result from construction of the 2011 Alternative Project would not be considered significant because these impacts would not substantially diminish habitat for wildlife in the region nor reduce any specific wildlife populations in the region to below self-sustaining numbers.

Indirect Impacts

Indirect impacts are those related to disturbance by construction (such as noise, dust, and urban pollutants) and long-term use of the Project site and its effect on the adjacent habitat areas. The indirect impact discussion below includes a general assessment of the potential indirect affects (noise, dust and urban pollutants, lighting, human activity, and non-native species introduction), of the construction and operation of the 2011 Alternative Project. Particular focus is placed on the indirect effects on the natural open space area from the Alternative Project - 2011, collectively referred to as edge effects.

Edge effects occur where development, including roads, takes place adjacent to natural open space areas. Edge effects threaten the ecological integrity, recreational experience, aesthetic quality, public investment, and safety operations of preserved or undeveloped natural areas located adjacent to

developed areas. When development is configured in a manner that creates a high ratio of development edge to natural open space, there is an increase in the potential impacts caused by human use (indirect impacts). These indirect effects that address both the short-term construction and long-term use of the Project site are outlined below.

Pebble Plains

The Polique Canyon pebble plains are situated on USFS land approximately 1,056 feet northeast of the Moon Camp project site, at an elevation of about 60m (200 feet) above the 2011 Alternative Project. Forest Service comments on the Revised and Re-circulated Draft EIR expressed concern that development of the Moon Camp property could represent an indirect impact to the pebble plains from foot traffic generated by the Moon Camp residents. However, according to the Supplemental Focused Special Status Plant Species Survey (August 29, 2010), there is no apparent footpath or trail connection between the Moon Camp property and the pebble plains. For Moon Camp residents to hike up to the pebble plains, they would have to traverse up the 300+ meter-ridge with a 60m-elevation gain across the brush-covered slope. Therefore, an indirect impact to the pebble plains would be unlikely.

Noise Impacts

Noise levels on the Project site would increase over present levels during and upon completion of construction of the 2011 Alternative Project. During construction, temporary noise impacts have the potential to disrupt foraging, nesting, roosting, and denning activities for a variety of wildlife species. Upon completion of construction, noise levels on the Project site would increase as a result of increased human activity associated with residential uses. Both short and long-term noise impacts could potentially disrupt the foraging and roosting potential of the site for the bald eagle. Any interruption of the foraging and/or roosting behavior of the bald eagle would be considered a significant impact.

Noise attenuation measures were recommended within Section 4.6, Noise, of the Revised and Recirculated Draft EIR No. 1 (see Mitigation Measures NOI-1 through NOI-4). However, both short- and long-term residential noise impacts on the bald eagle would be considered an unavoidable significant impact of the 2011 Alternative Project.

Increased Dust and Urban Pollutants

Grading activities would disturb soils and result in the accumulation of dust on the surface of the leaves of trees, shrubs, and herbs in the natural open space areas adjacent to the Project site. The respiratory function of the plants in these areas would be impaired when dust accumulation is excessive. These impacts are considered adverse; however, the 2011 Alternative Project will be consistent with SCAQMD Rule 403, which governs emissions of fugitive dust. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour (mph), sweeping loose

dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites. In addition, the 2011 Alternative Project will implement mitigation measure AQ-1 (see Section 4-2, Air Quality, of the Revised and Recirculated Draft EIR No. 1 located within Appendix A), further reducing impacts from dust. Compliance with South Coast Air Quality Management District (SCAQMD) Rule 403 and mitigation measure AQ-1 will reduce impacts in this regard to a level of less than significant.

Night Lighting

Lighting of the residential units would inadvertently result in an indirect effect on the behavioral patterns of nocturnal and crepuscular (i.e., active at dawn and dusk) wildlife that are present along the boundaries of the natural areas of the Project site. Of particular concern is the effect on small ground-dwelling animals that use the darkness to hide from predators, and on owls, which are specialized night foragers. In addition, the increase in night lighting could discourage nesting and roosting along the lake shore. Most notably, lighting associated with the 2011 Alternative Project could disrupt roosting behavior of the bald eagle on the Project site. Long-term and short-term light attenuation measures were recommended within Section 4.1, Aesthetics, of the Revised and Recirculated Draft EIR No. 1 (see Mitigation Measures A-1a, A-1b and A-4a through A-4f.). In addition, mitigation measures BR-9 and BR-10 will be implemented to require street lamps on the Project site not to exceed 20 feet in height, and be fully shielded to focus light onto the street surface and shall avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights will be required to utilize low color temperature lighting (e.g., red or orange). Mitigation measure BR-10 will also require outdoor lighting for proposed homes on the individual tentative tracts to not exceed 1,000 lumens. These restrictions on outdoor lighting of the individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This requirement shall also be published in the Homeowner's Association Conditions, Covenants & Restrictions (CC&Rs). Therefore, with implement mitigation measures to reduce lighting impacts, the increased lighting would be considered less than significant.

Human Activity

The increase in human activity (i.e., noise, foot traffic) would increase the disturbance of natural open space adjacent to the Project site. Human disturbance could disrupt normal foraging and breeding behavior of wildlife remaining in adjacent areas, diminishing the value of these open space habitat areas. Most notably, residential activity associated with the 2011 Alternative Project –could disrupt foraging and roosting behavior of the bald eagle on the Project site. Mitigation measure BR-11 will be implemented to limit the amount of human disturbance on adjacent natural open space areas by posting signs along the northern and eastern perimeter of the Project site where the property boundary abuts USFS open space with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash at all times." In addition, a requirement stating that residents shall keep out of adjacent open space areas to the north with the exception of designated

trails will be published in the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents. Although the 2011 Alternative Project will implement mitigation measures to reduce impacts to open space habitat areas, the increased residential activity and habitat loss would be considered potentially significant.

Non-Native Species Introduction

The native habitat types within the natural open space areas adjacent to the Project site would be subject to greater pressure from non-native plant species within the developed portions of the Project site. Areas that have undergone disturbance generally contain a high number of non-native grasses and forbs that can successfully out-compete the native plants in the region. This will be especially true after initial project grading of the Project site. Should non-native plants establish themselves in these areas prior to the establishment of native plant species or non-native/non-invasive plant species in the landscape areas, the non-natives may become invasive in the natural open space areas. Left uncontrolled, these "weeds" may begin encroaching into the adjacent natural areas. These impacts could become significant if uncontrolled.

The 2011 Alternative Project will be required to implement mitigation measure BR-12 to develop a landscaping plan for the entire tract (inclusive of a plant palette) with an emphasis on native trees and plant species, and such plan shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review will determine that invasive, non-native plant species are not to be used in the proposed landscaping. The biologist will suggest appropriate native plant substitutes or non-invasive, non-native plants. A note will be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform to the overall approved tract map landscaping plan. A requirement will be included stating that residents will be restricted to the use of tree and plant species approved per the overall tract map landscaping plan. The Homeowner Association CC&Rs shall also require individual lot owners to use only tree and plant species approved per the overall tract map landscaping plan/plant palette. Consistency with mitigation measure BR-12 will reduce impacts in this regard to a level of less than significant.

Jurisdictional Waters

Waters of the U.S. (Non-Wetland) Determination

Based on the results of the field observations and data collection, RBF identified 0.15 acre of USACE jurisdictional "waters of the U.S." within the Project site. The drainages are ephemeral; Big Bear Lake, although not included in the acreage calculation, is also considered jurisdictional by USACE. Utilizing the most current development plans, it was determined that the proposed improvements would impact up to 0.04 acres of waters of the U.S. under USACE jurisdiction. Therefore, recommendations were made to avoid the sensitive habitats, where feasible, and to mitigate off-site at 3:1 for direct impacts and 1:1 for indirect impacts if impacts couldn't be avoided. Consistency with mitigation measure BR-13 will reduce impacts in this regard to a level of less than significant.

California Department of Fish and Game (1602) Jurisdiction

Based on the results of the field observations and data collection, RBF identified 0.15 acre of CDFG jurisdictional streambed. Utilizing the most current development plans, it was determined that the proposed improvements would impact up to 0.04 acre of CDFG jurisdiction waters of the State. Therefore, recommendations were made to avoid the sensitive habitats, where feasible, and to mitigate off-site at 3:1 for direct impacts and 1:1 for indirect impacts if impacts couldn't be avoided. Consistency with mitigation measure BR-13 will reduce impacts in this regard to a level of less than significant.

Wildlife Movement

The development of the Project site would not impact designated wildlife corridors; however, it may affect local travel routes. Construction of the residential areas would result in reduced connectivity between Big Bear Lake as a water source to the contiguous open spaces on and to the north of the Project site. Additionally, construction of the 2011 Alternative Project–would result in increased traffic on the Project site by residents that would further impede movement of terrestrial wildlife currently crossing the site and SR-38. Although this impact is considered locally adverse, it is not considered significant because the impact does not substantially affect a regionally important wildlife movement corridor.

Potential Conflict With Regional and Local Policies/Plans

County of San Bernardino General Plan

The project site is located in unincorporated San Bernardino County and is subject to the provisions and policies of the County of San Bernardino General Plan. The General Plan contains a list of species considered Rare, Threatened, or Endangered by the County. Projects potentially impacting County-listed species must prepare an EIR to determine the significance of impacts on these species. Two plant species identified within the General Plan, Parish's checkerbloom and bird's foot checkerbloom, have the potential to occur on the Project site. Krantz's 2008 Supplemental Focused Special Status Plant Species Survey, during a normal precipitation year, concluded that neither of the two plant species were identified on site and they are not considered likely to occur on site.

County of San Bernardino Biotic Resources Overlay District

The intent of the BR Overlay District is to require the preparation of a biological technical report for projects within the BR Overlay District identifying impacts to biological resources and mitigation measures designed to reduce or eliminate 2011 Alternative Project-related impacts. The biological technical reports prepared as part of this Revised and Recirculated Draft EIR No. 2 are intended to satisfy the requirements of the BR Overlay District.

Plant Protection and Management Ordinance – County of San Bernardino Development Code

Title 8, Division 9 of the San Bernardino County Development Code contains policies and requirements applicable to the Project site, including Section 89.0110(a), 89.0115(c), and 89.0205.

Section 89.0110(b) states that the provisions of this Division shall not authorize the removal of perch trees within identified American bald eagle habitat.

Section 89.0115(c) requires that the County "may require certification from an appropriate tree expert or native plant expert that such tree removals are appropriate, supportive of a healthy environment and are in compliance with the provisions of this chapter." The Results of Bald Eagle Survey on Tentative Tract 16136, Moon Camp, Fawnskin, San Bernardino County, California, Bonterra Consulting Report (2002) and the Bald Eagle Count in Area, Moon Camp, Fawnskin, San Bernardino County, California, US Forest Services Report (2009), are intended to satisfy the requirements of this section (refer to Appendix A of this Revised and Recirculated Draft EIR No. 2). The County shall make a determination based on the evidence presented herein and in the Forester's Report as to the significance of the 2011 Alternative Project impacts to native plants and compliance with the provisions of Division 9 of the County Development Code.

The intent of Section 89.0205 is to treat coniferous tree species such that they don't present a risk of fire, and spread tree insect pests and infection. Compliance with this Section would be enforced by the County standard conditions and requirements during construction of the 2011 Alternative Project.

Wildlife Movement

The project site does not contain wildlife crossings or corridors. Nonetheless, the Project site could be used as a travel route connecting forest habitat to the north with Big Bear Lake. However, direct connection to open space areas north and east of the Project site are obstructed by SR-38. The importance of this travel route may be diminished by the vehicle traffic hazard associated with crossing SR-38 as well as the availability of similar habitat immediately adjacent to the east of the Project site.

Migratory Bird Treaty Act

There are a large number of bird species that were observed to use the Project site for nesting. Due to the difficulty locating nests of cavity-nesting and other species of birds, a preconstruction nesting bird survey is not feasible. However, implementation of the 2011 Alternative Project may impact the nests of species covered by the MBTA, including the Cooper's hawk, purple martin, and hepatic tanager. Therefore, the 2011 Alternative Project should time tree removal to occur outside of the nesting period for birds, generally February through July. However, Mitigation Measure BR-7 will require tree removal to occur outside of the nesting period for birds, reducing impacts to a level of less than significant.

Cumulative Impacts

Significant and unavoidable adverse impacts from development of the 2011 Alternative Project related to Biological Resources have been identified for impacts to the bald eagle. Mitigation Measure BR-4 requires that eagle perch locations be preserved in place upon completion of the 2011 Alternative Project, and that any development that may occur within the 2011 Alternative Project site

and in the individual lots must avoid impacts to trees larger than 24 inches diameter breast height (dbh) and their root structures. Still, even with the implementation of Mitigation Measure BR-4 and the establishment of nearly 6 acres of Conservation/Open Space set aside, some trees will still need to be removed from the 2011 Alternative Project site to allow for the development of the 50 residential lots. Additionally, due to the County's strict threshold for impacts to the bald eagle under CEQA, any human development and habitation on the Project site would result in a significant impact. This is considered a significant and unavoidable project-specific, as well as cumulative, impact.

Six listed threatened or endangered species could potentially occur on the Project site. These include bird's foot checkerbloom (endangered), San Bernardino bluegrass (endangered), California dandelion (endangered), Big Bear Valley sandwort (threatened), southern mountain buckwheat (endangered), and slender-petalled thelypodium (endangered). In addition, 26 CNPS List 1B or 2 species could potentially occur on the Project site. According to the Supplemental Focused Special Status Plant Species Survey conducted by Dr. Krantz (2008), no endangered, threatened, or special-status plant species were identified on the Moon Camp property, and the potential for any occurrence of such species is considered to be extremely low. In addition, impacts to CNPS List 1B or 2 species special status plants, not listed as threatened or end angered (Section IV. B.4.) would generally not meet the CEQA threshold for mandatory findings of significance. Therefore, impacts in this regard will be less than significant. When considered in connection with the development of the cumulative projects, the impacts of the 2011 Alternative Project on special status plant species are less than significant.

A total of 50.72 acres of Jeffrey pine forest, including 13.81 acres of open Jeffrey pine forest, would be impacted by 2011 Alternative Project implementation. Approximately 58,526 acres of Jeffrey pine forest occurs in the San Bernardino National Forest and 141,604 acres in the Cleveland, San Bernardino, Angeles and Los Padres National Forests, collectively. Approximately 4.2 acres of open Jeffrey pine forest will be permanently preserved by a conservation easement. Impacts on this vegetation type would be considered cumulatively less than significant since this vegetation type is common throughout the San Bernardino Mountains and other mountain ranges in the region.

A total of 4.0 acres of ruderal lake shoreline would be impacted by 2011 Alternative Project implementation. Man-made lakes are essentially distinct ecosystems, with an aquatic fauna and flora that bears little resemblance to what naturally occurs in the streams that formed them. Impacts on this vegetation type would be considered less than significant.

A total of 2.82 acres of disturbed vegetation in developed areas (SR-38) would be impacted by 2011 Alternative Project implementation. Impacts on this vegetation type would not be considered significant since this vegetation type is considered to have a low biological value.

In summary, when considered in conjunction with the other cumulative projects, the 2011 Alternative Project would add incrementally to the cumulative significant impact on the bald eagle. Accordingly, cumulative impacts to the bald eagle are considered significant and unavoidable.

2.1.7 - Mitigation Measures

The mitigation measures associated with the 2011 Alternative Project are described below.

Special Status Biological Resources

Special Status Plants and Plant Communities

MM BR-1a Prior to the initiation of clearing or grading activities on the Project site, a conservation easement shall be placed upon the 10-acre Dixie Lee Lane property. The conservation easement shall be in favor of a qualified conservation entity and shall be recorded in the San Bernardino County Recorder's Office. The easement shall provide for the continued protection and preservation of the property. The easement shall, at a minimum, restrict all use of the property that has the potential to impact the quality of pebble plain soils and other valuable biological habitat, including the occurrences of the Federally Threatened Ashy-Gray Indian Paintbrush. Project proponent shall also create a perpetual, non-wasting endowment for the management and preservation of the mitigation property. The management entity will be approved by the CDFG.

MM BR-1b Prior to the initiation of clearing or grading activities on the Project site, the 5.38-acre on-site conservation easements (including Lot-A and Lot-H) shall be established. The conservation easement shall be in favor of a qualified conservation entity and shall be recorded in the San Bernardino County Recorder's Office. The easement shall provide for the continued protection and preservation of the property. The easement shall, at a minimum, restrict all use of the property that has the potential to impact the occurrences of the Federally Threatened Ashy-Gray Indian Paintbrush. Project proponent shall also create a perpetual, non-wasting endowment for the management and preservation of the mitigation property. The management entity will be approved by the CDFG.

MM BR-1c Project Applicant shall take the following actions to further ensure the permanent preservation of the Conservation Areas (Lot A and Lot H):

- Restrict access by pedestrians and motor vehicles to the Conservation Areas. The Conservation Areas shall be secured through installation of fencing or other barriers to prevent access to Conservation Areas. Barriers shall be installed prior to commencement of any construction activities on site. Applicant shall also include provisions in the CC&Rs for the Project instituting penalties to residents who violate the restrictions and cause any damage to the protected plant habitat.
- Include enforcement provisions in the CCR's allowing the Homeowners Association, individual resident within the project and/or County of San

Bernardino to enforce any violation of the provisions intended for the protection of sensitive plant species located within Lot A and Lot H.

- Install appropriate signage identifying Conservation Areas and the sensitive nature of such areas on the project site and that access is prohibited.
- Prohibit use of invasive plant species in landscaping. Each lot owner shall be given a list of prohibited invasive plant species upon purchase of lot with the parcel. Landscape plans for individual parcels shall be approved by the County prior to development to ensure no inappropriate plant material is incorporated into the design of any individual lot or common area which may compromise the quality of the Conservation Areas.
- Development may not change the natural hydrologic conditions of the Conservation Areas. All grading plans shall be reviewed by the County to ensure hydrologic conditions of the conservation lands are not adversely changed by development
- Applicant or appointed conservation entity shall monitor Conservation Areas on a periodic basis to ensure invasive, non-native species are not present. All non-nature invasive plant species shall be removed from Conservation Areas.

MM BR-1d Construction to the rear portions of Lots 47, 48, 49, and 50 shall be restricted by means of building envelopes or building setback lines to prevent construction in the occupied Ashy-Gray Paintbrush habitat, wherever feasible.

Special Status Wildlife

MM BR-2 Trees and downed logs shall remain in place, to the extent that clearing is not required by the development process, and a 50-foot setback (measured on each side of the centerline) must be maintained along the deepest ravine at the eastern edge of the property. This measure will serve to preserve habitat for potential special status wildlife species.

MM BR-3 The project proponent shall have a biologist qualified with San Bernardino flying squirrel (SBFS) as a monitor during tree removal.

Minimize the number of trees, snags, and downed wood removed for project implementation. Compensating the removal of snags containing cavities; this would be achieved by constructing and erecting two nest boxes and one aggregate box per snag removed. Appendix A of this Revised and Recirculated Draft EIR No. 2 provides the specifications of the nest and aggregate boxes (Flying Squirrels 2007). These boxes should be located on the adjacent U.S. Forest Service (USFS) land (with their permission) and the locations marked with a global positioning system. The locations of the boxes shall be provided to the USFS so that their biologists could monitor the boxes for occupation by SBFS.

Provide new homeowners with a flyer that would provide information on the biology of SBFS and how they are susceptible to depredation by cats. The flyer would also outline steps that homeowners could take to reduce their urban edge effects.

MM BR-4 Eagle perch trees identified in the 2002 Bonterra Consulting Bald Eagle Survey for Tentative Tract 16136, Moon Camp, Fawnskin, San Bernardino County, California, (see Appendix A of this Revised and Recirculated Draft EIR No. 2) shall be preserved in place upon project completion. If any of the designated perch trees should become hazardous and need to be taken down, replacement will be at a 5:1 ratio with the creation of artificial perch trees along shoreline designated open space. Any development that may occur within the Project site and in the individual lots must avoid impacts to trees larger than 24 inches dbh and their root structures to the maximum extent feasible. If any additional non-perch trees on-site larger than 24 inches dbh are removed, then a replacement ratio of 2:1 shall be required and replacement trees shall be 24-inch box trees or larger. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of the individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.

MM BR-5 Prior to vegetation clearing, grading, or other disturbance, the Project site shall be surveyed to identify all large trees (i.e., greater than 20 inches in diameter at 4.5 feet from the ground) within 600 feet from the high water line. Trees identified on the Project site as having a diameter in excess of 20 inches at 4.5 feet from the ground within 600 feet of the shoreline shall be documented and tagged. Any development that may occur within the Project site and in the individual lots shall avoid impacts to tagged trees and their root structures. If such trees cannot be avoided, their removal shall be coordinated with the County of San Bernardino to minimize impacts to the extent feasible. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. These restrictions on development of individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This measure shall be identified as a Note on the Composite Development Plan.

MM BR-6 Seven days prior to the onset of construction activities, a qualified biologist shall survey within the limits of project disturbance for the presence of any active raptor nests. Any nest found during survey efforts shall be mapped on the construction

plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG.

If nesting activity is present at any raptor nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code. Nesting activity for raptors in the region of the Project site normally occurs from February 1 to June 30. To protect any nest site, the following restrictions on construction are required between February 1 and June 30 (or until nests are no longer active as determined by a qualified biologist): (1) clearing limits shall be established a minimum of 300 feet in any direction from any occupied nest and (2) access and surveying shall not be allowed within 200 feet of any occupied nest. Any encroachment into the 300/200-foot buffer area around the known nest shall only be allowed if it is determined by a qualified biologist that the proposed activity shall not disturb the nest occupants. Construction during the nesting season can occur only at the sites if a qualified biologist has determined that fledglings have left the nest.

MM BR-7 Vegetation removal, clearing, and grading on the Project site should be performed outside of the breeding and nesting season (between February 1 and June 30), when feasible, to minimize the effects of these activities on breeding activities of migratory birds and other species. If clearing occurs during breeding season, a 30-day clearance survey for nesting birds shall be conducted. Any nest found during survey efforts shall be mapped on the construction plans. If no active nests are found, no further mitigation would be required. Results of the surveys shall be provided to the CDFG. If nesting activity is present at any nest site, the active site shall be protected until nesting activity has ended to ensure compliance with Section 3503.5 of the California Fish and Game Code.

MM BR-8 The use of the boat dock for motorized boating shall be prohibited between the dates of December 1 and April 1. No motorized boats shall be allowed to launch or moor in the vicinity of the boat dock at any time during this period. This restriction shall be clearly displayed on signage at the entrance to the parking lot and on the boat dock visible from both land and water. This requirement shall also be published in the Homeowner's Association CC&Rs.

Sensitive Natural Communities/Habitats

Wildlife Impacts/Indirect Impacts

MM BR-9 Street lamps on the Project site shall not exceed 20 feet in height, shall be fully shielded to focus light onto the street surface and shall avoid any lighting spillover onto adjacent open space or properties. Furthermore, street lights shall utilize low color temperature lighting (e.g., red or orange).

MM BR-10 Outdoor lighting for proposed homes on the individual tentative tracts shall not exceed 1,000 lumens. Furthermore, residential outdoor lighting shall not exceed 20 feet in height and must be shielded and focused downward to avoid lighting spillover onto adjacent open space or properties. These restrictions on outdoor lighting of the individual lots must be clearly presented and explained to any potential prospective developers and/or homeowners prior to assumption of title and close of escrow. This requirement shall also be published in the Homeowner's Association CC&Rs.

MM BR-11 To limit the amount of human disturbance on adjacent natural open space areas, signs shall be posted, to the satisfaction of the Planning Director or appointee, along the northern and eastern perimeter of the Project site where the property boundary abuts USFS open space with the following statement: "Sensitive plant and wildlife habitat. Please use designated trails and keep pets on a leash at all times."

In addition, a requirement stating that residents shall keep out of adjacent open space areas to the north with the exception of designated trails will be published in the Homeowner Association CC&Rs and a map of designated hiking trails will be provided to all residents.

MM BR-12 Prior to recordation of the final map, a landscaping plan for the entire tract shall be prepared (inclusive of a plant palette) with an emphasis on native trees and plant species, and such plan shall be submitted to the County of San Bernardino for review and approval by a qualified biologist. The review shall determine that invasive, non-native plant species are not to be used in the proposed landscaping. The biologist will suggest appropriate native plant substitutes or non-invasive, non-native plants. A note shall be placed on the Composite Development Plan indicating that all proposed landscaping (including landscaping on individual lots) shall conform to the overall approved tract map landscaping plan. A requirement shall be included stating that residents shall be restricted to the use of tree and plant species approved per the overall tract map landscaping plan. The Homeowner Association CC&Rs shall also require individual lot owners to use only tree and plant species approved per the overall tract map landscaping plan/plant palette.

Jurisdictional Delineation

MM BR-13 Prior to issuance of grading permits, the Project applicant shall obtain all required authorization from agencies with jurisdiction over all unavoidable impacts to State and federal jurisdictional lakes, streams, and associated habitat within the Project site. Impacted features shall be offset through onsite restoration, offsite restoration, or purchase of credits at an agency-approved mitigation bank in the region at no less

than a 3:1 for direct impacts and 1:1 for indirect impacts if impacts cannot be avoided.

Wildlife Movement

No mitigation measures are recommended.

Regional and Local Policies/Plans

No mitigation measures are recommended.

Cumulative

No mitigation measures are recommended.

2.1.8 - Level of Significance After Mitigation

As indicated above, the Project revisions incorporated into the 2011 Alternative Project analyzed herein, are in direct response to the Supplemental Focused Special Status Plant Species Survey prepared by Dr. Krantz (August 2010). The survey identified a large number of Ashy-Gray Indian Paintbrush occurrences in the western portion of the Project site, an area previously identified as residential Lots 1-3. The subdivision was revised to create a new Lot H for Open Space Conservation to permanently protect the identified occurrences of Ashy-Gray Indian Paintbrush.

Additionally, the Supplemental Focused Special Status Plant Species Survey (August 29, 2010) clarified that the 0.69 acre area previously identified as sensitive pebble plain habitat, located in the northern central portion of Lot A, is not true pebble plain habitat due to the lack of associated indicator species. Moreover, the area in the northern portion of Lot A now comprised of residential Lots 1-3 contain fewer occurrences of Ashy-Gray Indian Paintbrush when compared to the area now comprised of Lot H.

The Supplemental Focused Special Status Plant Species Survey (August 29, 2010) concluded that Project site contained 5,567 occurrences of Ashy-Gray Indian Paintbrush with 84 percent, or 4,665 of the occurrences, located in the area now classified as Lot H. An additional 230 Ashy-Gray Indian Paintbrush occurrences are located in the remainder portion of Lot A after redesign of the subdivision. In total, approximately 88 percent of the Ashy Gray Indian Paintbrush occurrences on the Project site will be protected through permanent conservation easements burdening both lettered Lots A and H.

Additionally, the 2011 Alternative Project will be required to permanently conserve a 10-acre parcel off-site known as the Dixie Lee Lane parcel. The Dixie Lee Lane parcel contains the sensitive pebble plain soils and serves as suitable habitat for the Ashy-Gray Indian Paintbrush. The conservation of 88 percent of the Ashy-Gray Indian Paintbrush occurrences onsite (7:1 mitigation ratio) and permanent conservation of the Dixie Lee Lane 10-acre parcel reduces impacts to the Federally Threatened Ashy-Gray Indian Paintbrush to less than significant levels.

The area previously identified onsite as sensitive pebble plain habitat, and previously located within the boundaries of Lot A, will now be partially developed with a residential lot. However, upon closer examination, that area had been mischaracterized as true pebble plain habitat. Because no true pebble plain habitat exists onsite, disturbance of the area previously characterized as pebble plain and included within the boundaries of Lot A, does not result in a significant impact. In any event, even if true pebble plain soil conditions were disturbed through 2011 Alternative Project development, the permanent conservation of the Dixie Lee Lane 10-acre parcel, which has confirmed pebble plain habitat, would mitigate any potential impacts. Accordingly, impacts to sensitive pebble plain habitat is less than significant.

In addition, significant and unavoidable impacts related to Biological Resources have been identified for impacts to bald eagle. Mitigation Measure BR-4 would mitigate impacts by requiring replacement of perch trees at a ratio of 5:1 with the creation of artificial perch trees along the shoreline designated open space. In addition, any development that may occur within the Project site and in the individual lots must avoid impacts to these trees and their root structures. All construction or landscaping improvements, including irrigation, will be prohibited on or around the exposed root structures or within the dripline of these trees. However, because the 2011 Alternative Project would result in a permanent change in existing conditions under which the bald eagle currently occupies the site and vicinity, impacts would remain significant and unavoidable.

It should be noted that CEQA requires all potentially significant impacts be avoided or substantially reduced prior to project approval. As previously noted, the Project is likely to result in significant unavoidable impacts to the bald eagle. Based on the County of San Bernardino criteria for determining impacts to bald eagles, any removal of perch trees or human activity resulting in light noise impacts are considered a significant impact under CEQA. This threshold is so restrictive that there is no reasonable configuration to the 2011 Alternative Project that could avoid a significant impact to the bald eagle. Therefore, further project modifications would not avoid or substantially reduce the identified impacts to bald eagles.

No additional significant impacts related to Biological Resources have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

Appendix A:
Biological Resources Assessment

A.1 - Results of Bald Eagle Survey on Tentative Tract 16136 (Bontera Consulting, 2002)

Bonterra
CONSULTING
An Environmental Planning/Resource Management Corporation

April 16, 2002

Mr. Glenn Lajoie
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618-2027

VIA FACSIMILE AND MAIL
(949) 472-8373

Subject: Results of Bald Eagle surveys on Tentative Tract 16136, Moon Camp, Fawnskin, San Bernardino County, California

Dear Mr. Lajoie:

This letter report presents the results of bald eagle (*Haliaeetus leucocephalus*) surveys performed in February 2002 by William S. La Haye and Brian Kertson on Tentative Tract 16136 in unincorporated San Bernardino County, California (hereafter referred to as the project site). In addition, a summary of a records search of historic sightings of this species on and in the vicinity of the project site is also presented.

Project Location and Description

The project site consists of an approximately 62.5-acre parcel on the north shoreline of Big Bear Lake, San Bernardino County, California. The project site is covered by U.S. Geological Survey's Fawnskin, California Quadrangle at Township 2N, Range 1E and includes portions of Sections 7 and 12. Project regional location and vicinity maps are presented in Exhibits 1 and 2, respectively.

The southwestern portion of the project site includes shoreline of Big Bear Lake and Highway 38 parallels the lakeshore on the property for approximately 1/4 mile. Historically, the project site consisted of Moon Camp, a small cabin resort which existed from the early 1920s through 1951 when a forest fire destroyed most of the buildings. At some later date, most of the remnants of the cabins and foundations were removed from the site.

The project site includes a series of low, rolling hills between approximately 6,940 feet above mean sea level (msl) and 6,740 feet above msl. The vegetation on the site is primarily open Jeffrey pine (*Pinus jeffreyi*) forest near the lake and highway and gradually transitions into mixed-conifer forest towards the northeast portion of the property. Other common trees encountered on the site consist of white fir (*Abies concolor*) and black oak (*Quercus kelloggii*).

Background

The bald eagle is a large raptor which ranges from Alaska to northern Mexico. It typically nests in large trees near lakes and rivers where its prey is plentiful. This species feeds primarily on fish and waterfowl; however, it is also known to

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scavenge large mammal carcasses. The bald eagle population declined dramatically in the 1960s due to the effects of pesticides causing egg shell thinning and reproductive failure. This species is federally-listed as Threatened and state-listed as Endangered.

The bald eagle rarely nests in southern California. However, small wintering populations are found scattered throughout the region. Big Bear Lake supports the largest of these wintering populations and may include as many as 30 individuals in peak years. This species is typically observed at Big Bear Lake between November and March.

Survey Methodology

The project site and the surrounding area was observed on four separate occasions in February 2002 for approximately four hours on each occasion. Trees on the property were visually scanned using binoculars and a spotting scope. Observations were conducted from various vantage points on the property, as well as from Windy Point, approximately 1/2 mile west of the property across Grout Bay. All trees utilized by eagles for perching and/or roosting during these surveys were marked with numbered, circular tree tags. Additionally, the San Bernardino National Forest Service was contacted and a review of their historic records of bald eagle use on the north shore of Big Bear Lake was completed.

Survey Results

Bald eagle observations were performed on February 7, 12, 14, and 21, 2002. Bald eagles were observed on the project site on all four occasions. A minimum of nine, seven, three, and four individual bald eagles were seen on the four observation dates, respectively. Bald eagles were observed perching in three, eight, two, and two separate trees on the project site on the respective observation dates. Nine individual trees were used on the project site by bald eagles during surveys. The sizes and descriptions of the trees used for perching are provided in Table 1. Tree locations on the project site are presented in Exhibit 3.

The best and most reliable data for reviewing historical use of the project site by bald eagles was an unpublished report by Devaud and Devaud in 1990 which presented the findings of surveys conducted during the winter of 1989-1990. The Devauds observed, mapped, and photographed bald eagle perch trees along the north shoreline of Big Bear Lake between December 10 and April 6 of that winter. Eighty of the 176 mapped eagle sightings (45 percent) were located on the project site. The most commonly recorded use of a single perch tree was also on the project site with 51 sightings (i.e., tree number 886). This is clearly the most important eagle perch tree on the project site and potentially the most important on the north shore of Big Bear Lake. The next most commonly recorded use of a single perch tree was off the project site near the east end of the lake with 32 sightings.

Recommendations

The project site contains several trees used extensively by this wintering population of bald eagles. Removal of these trees could restrict access to and/or affect the ability of individual eagles to forage in the vicinity of Big Bear Lake. Removal of important perch trees could be considered a significant impact under the federal and state Endangered Species Acts (ESA). It is recommended that the numbered trees presented in Table 1 are avoided during project construction and preserved in place upon project completion. Additionally, all large trees (i.e., greater than 20-inches diameter at four feet from ground) within approximately 200 yards of the

high water line should be considered potential perch trees, avoided during construction, and preserved in place upon project completion, if possible.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Principal, Biological Services

Samuel C. Stewart IV
Assistant Project Manager

R:\Projects\RBF\J008 Eagle Survey-041602.wpd

Enclosures: Table 1 and Exhibits 1-3

References

Devaud J. & Devaud S. 1990. *Bald Eagle Habitat Use of the North Shore of Big Bear Lake, San Bernardino County, California.* Unpublished Document in San Bernardino National Forest Service Files.

Environmental Planning Consultants. 1988. *Big Bear Lake Bald Eagle Cumulative Impact Study.* Unpublished Document in San Bernardino National Forest Service Files.

A.2 - Bald Eagle Count in Area (U.S. Fish and Wildlife Service, 2009)

US Forest Service
San Bernardino National Forest

602 S. Tippecanoe Ave San Bernardino, CA 92408

FOR IMMEDIATE RELEASE

Big Bear Lake and Lake Arrowhead Contact: Robin Eliason – reliason@fs.fed.us; 909-382-2832(o) or 909-844-4131(c)
Lake Hemet Contact: Heidi Hoggan hhoggan@fs.fed.us; 909-382-2945
Silverwood Lake State Recreation Area Contact: Kathy Williams - khwilliams@parks.ca.gov; 760-389-2303(o); 760-963-7911(c); or Kevin Forester - kforrester@parks.ca.gov

BALD EAGLES SEEN IN LOCAL MOUNTAINS

SAN BERNARINO, Calif. January 10, 2009 - On Saturday January 10th, the first bald eagle count of the winter was conducted by local Federal and State biologists and volunteers around lakes in the San Bernardino and San Jacinto Mountains. Despite extremely windy conditions, large numbers of volunteers turned out for a chance to see one of our magnificent national birds. High wind gusts made standing challenging and kept knocking over some of the spotting scopes. Nonetheless, the effort was successful in tallying the bald eagles spending their winter vacations at local mountain lakes.

A grand total of twelve eagles (8 adults, 4 juveniles) were observed in the four lake areas during the 1- hour count. Six eagles (4 adults, 2 juveniles) were observed in the Big Bear/Baldwin Lake area; 2 eagles (1 adult, 1 juvenile) at Lake Arrowhead; 3 eagles (2 adults, 1 juvenile) at Silverwood Lake; and, 1 adult eagle at Lake Hemet. Juvenile eagles are distinguished by a brown head and tail; adults are recognized by the famous white head and tail - it takes 4-5 years to acquire full adult coloration. Juvenile eagles are the same size as the adults.

The count for Big Bear was a little lower than average; probably due in part to the fact that a large portion of the lake has been frozen over for several weeks. When the lake is frozen, ducks do not stay in the area. Ducks are the main prey for bald eagles; so when there are low numbers of ducks, there are low numbers of bald eagles.

Approximately 140 volunteers participated in the 1-hour eagle census at four lakes (50 at Big Bear area; 15 at Lake Arrowhead; a record 50 at Lake Hemet; and, 25 at Silverwood Lake). The Forest Service and State Recreation Area biologists would like to thank those volunteers!

The U.S. Forest Service and State Recreation Area biologists have coordinated counts of this federally-protected species since 1978. Data from our local count will be added to the nation-wide Mid-Winter Bald Eagle census to assess recovery status of the species. We rely on volunteers to gather information during the monthly winter eagle counts. Counts are conducted

for a 1-hour period from 9-10 a.m. Forest Service volunteers stationed around lakes in Big Bear, Arrowhead, and Idyllwild record all observations of bald eagles. Volunteers at Silverwood Lake State Recreation Area conduct simultaneous counts.

Bald eagles are similar to many southern Californians in that they visit the lakes of our San Bernardino and San Jacinto Mountains for their winter vacations between November and April. Instead of vacationing here for dynamite skiing, eagles come for the plentiful food supplies. As lakes and rivers up north freeze each winter, fish become unavailable under a thick layer of ice and ducks leave the frozen waters. The eagles' "grocery stores" have essentially closed for the winter. So eagles fly south looking for open water stocked with food. The lakes of the San Bernardino and San Jacinto Mountains fit the bill perfectly--they are part of the Pacific Migratory Flyway, a migration freeway for millions of ducks. Eagles like to spend their winters here because of the abundant and tasty ducks and fish.

Our bald eagles normally migrate out of the San Bernardino and San Jacinto Mountains in late March, heading back to summer homes in Montana, Wyoming, Idaho, and Alberta, Canada. In recent years, a pair of bald eagles has remained at Lake Hemet and successfully produced several eaglets.

Catching a glimpse of our breath-taking national bird is relatively easy during the winter months. There are also some fantastic opportunities for excellent close-up photography. Just look in the tallest trees around the lakeshore. Or, if the lake is partially frozen, look for eagles perched on the ice near small groups of ducks using open water pockets.

Remember that human presence may distract or disturb the eagles--so, try to limit your movements and don't make loud noises when nearby. If possible, remain in your car while observing eagles--the car acts as a blind.

Don't forget to mark your calendars now for the remaining Eagle Counts: February 14, and March 14. Volunteers need not have experience--just bring binoculars and a watch (and dress warmly!).

For More Information about Bald Eagle Counts
Big Bear Lake and Lake Arrowhead Contact:
Robin Eliason – reliason@fs.fed.us; 909-382-2832
Lake Hemet Contact: Heidi Hoggan
hhoggan@fs.fed.us; 909-382-2945
Silverwood Lake State Recreation Area Contact:
Kathy Williams - khwilliams@parks.ca.gov; 760-389-2303

For More Information about Discovery Center Eagle Events
Call 909-382-2790 or stop by the Forest Service's Big Bear Discovery Center on the north side of Big Bear Lake
http://www.bigbeardiscoverycenter.com

For information about the San Bernardino National Forest, please visit: http://www.fs.fed.us/r5/sanbernardino

For information about Silverwood State Recreation Area, please visit:

http://www.parks.ca.gov/?page_id=650

BIG BEAR LAKE EAGLE COUNT SUMMARY

(Includes Big Bear and Baldwin Lakes)

1979 - 80		20	22	13	11	3	14	22
1980 - 81		11	19	25			18	25
1981 - 82		15	27	22	6	3	15	27
1982 - 83		7	27	18	11		16	27
1983 - 84		14	28	18	10		18	28
1984 - 85		27	8	3	3		10	27
1985 - 86		20	24		9		18	24
1986 - 87		20	24		9		18	24
1987 - 88		9	17	21	16		16	21
1988 - 89		12	6	4	12		9	12
1989 - 90		15	11	19	17		16	19
1990 - 91		6	16	22	17		15	22
1991 - 92		19	19	13	9		15	19
1992 - 93		6	15	3	3		7	15
1993 - 94		9	17	15	8		12	17
1994 - 95		10	10	20	No Count		13	20
1995 - 96		6	14	15	10		11	15
1996 - 97		10	15	5	9		10	15
1997 - 98		8	14 - 15	15	12		12	15
1998 - 99		8	17	15 - 17	9		11	17
1999 - 00		8	13	3	13		9	13
2000 - 01		13	13	14	12		13	14
2001 - 02		7	9	11	9		9	11
2002-03		6	13	15	9		11	15
2003-04		4	14	11	7		9	14
2004-05		6	1	4	5		4	6
2005-2006		7	4	6	No Count		6	7
2006-2007		4	8	5	5		6	8
2007-2008		4	3	6	3		4	6
2008-2009		No Count	6					
Average		11	15	13	10	5	12.26	18.14
						Maximum	18	28
						Minimum	4	6
						Median	12	17

A.3 - Focused Flying Squirrel Trapping Report (Michael Brandman Associates, 2007)

FOCUSED FLYING SQUIRREL TRAPPING REPORT MOONCAMP PROJECT, FAWNSKIN, SAN BERNARDINO COUNTY, CALIFORNIA

Prepared for:

County of San Bernardino
Department of Land Use Services
385 N. Arrowhead Avenue, First Floor
San Bernardino, California 92415-0182

Contact: Matthew W. Slowick, Senior Planner

Prepared by:

Michael Brandman Associates
621 E. Carnegie Drive, Suite 100
San Bernardino, California 92408
909.884.2255

Contact: Mikael Romich, Project Biologist

September 18, 2007

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SECTION 1: SUMMARY

This report contains the findings of Michael Brandman Associates (MBA) focused trapping survey for the San Bernardino flying squirrel (*Glaucomys sabrinus californicus*) (SBFS) on an approximately 62.5-acre property known as Tentative Tract 16136 (Moon Camp) located in the Community of Fawnskin, San Bernardino County, California. During the trapping period, no SBFS were caught on the project site. This effort provides reasonable evidence (defined by the USFWS (1990) as one week of trapping) that SBFS were absent from the project site during the period trapped. A number of mitigation measures are provided to minimize the potential for indirect and direct impacts, as well as enhancement of adjacent areas to compensate for the removal of suitable habitat.

SECTION 2: INTRODUCTION

At the request of San Bernardino County, MBA conducted a focused SBFS trapping survey with methods modified from survey protocols issued by the US Fish and Wildlife Service (USFWS 1990) and United States Department of Agriculture (USDA 1991) for a 62.5-acre property located in the Community of Fawnskin, San Bernardino County, California. This property is hereinafter referred to as project site or site.

2.1 - Project Location

The site is located in the San Bernardino National Forest, north of Big Bear Lake. State Highway 38 intersects the Site on the southern portion. The site is located south of Flicker Road, east of Oriole lane, and west of Polique Canyon Road, in the unincorporated community of Fawnskin, San Bernardino County, California (Exhibits 1 and 2). The Site consists of Assessor's Parcel Numbers 0304-082-04, 0304-091-12, -13, and -21. It is within sections 7 and 12, Township 2 North and Range 1 East of the Fawnskin U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Exhibit 3).

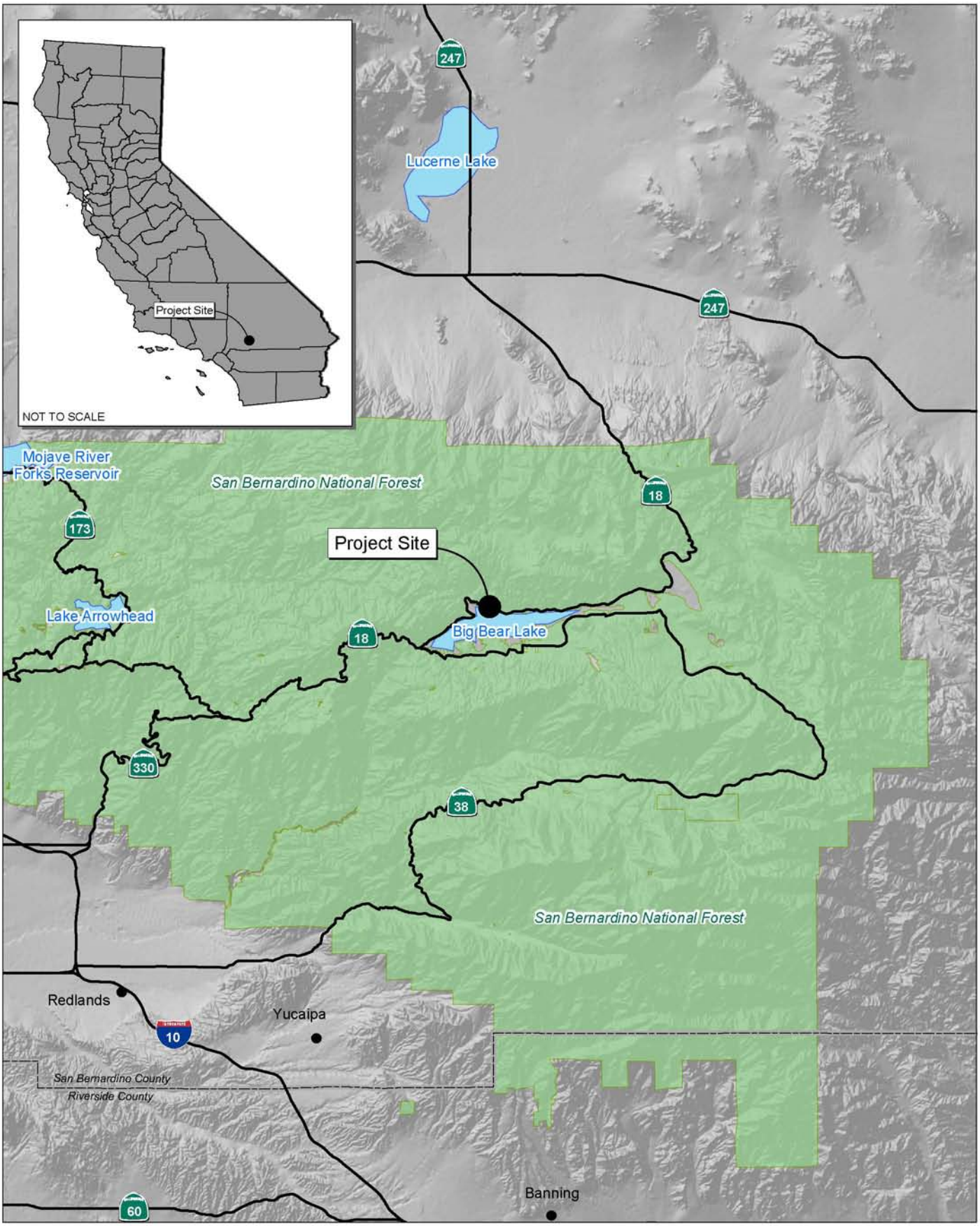
2.2 - Project Description

The proposed project is to subdivide the Site into 53 lots: fifty residential lots to be sold individually and developed into custom homes and 3 lettered lots, two of which would be designated as Open Space/Conservation easements.

2.3 - Environmental setting

Site elevations range from approximately 6,747 feet above mean sea level (msl) at the lakeshore to 6,960 feet above msl at the northeast corner of the Site. Individual slopes onsite range from five percent to forty percent. Slope orientation is generally from north to south toward the lake, except for three natural ravines on the project site that contain eastern and western slopes.

The dominant plant community observed on the site is Jeffrey pine forest (54.91 acres), which includes Jeffrey pine (*Pinus jeffreyi*), white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak occurring at lower densities. The Jeffrey pine forest onsite is unevenly aged composed of approximately 85 percent Jeffrey pine, eight percent western juniper, six percent singleleaf pinyon pine, and less than 1 percent of scattered white fir and black oak. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), Greg's ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl leaf mountain mahogany (*Cercocarpus ledifolius*).



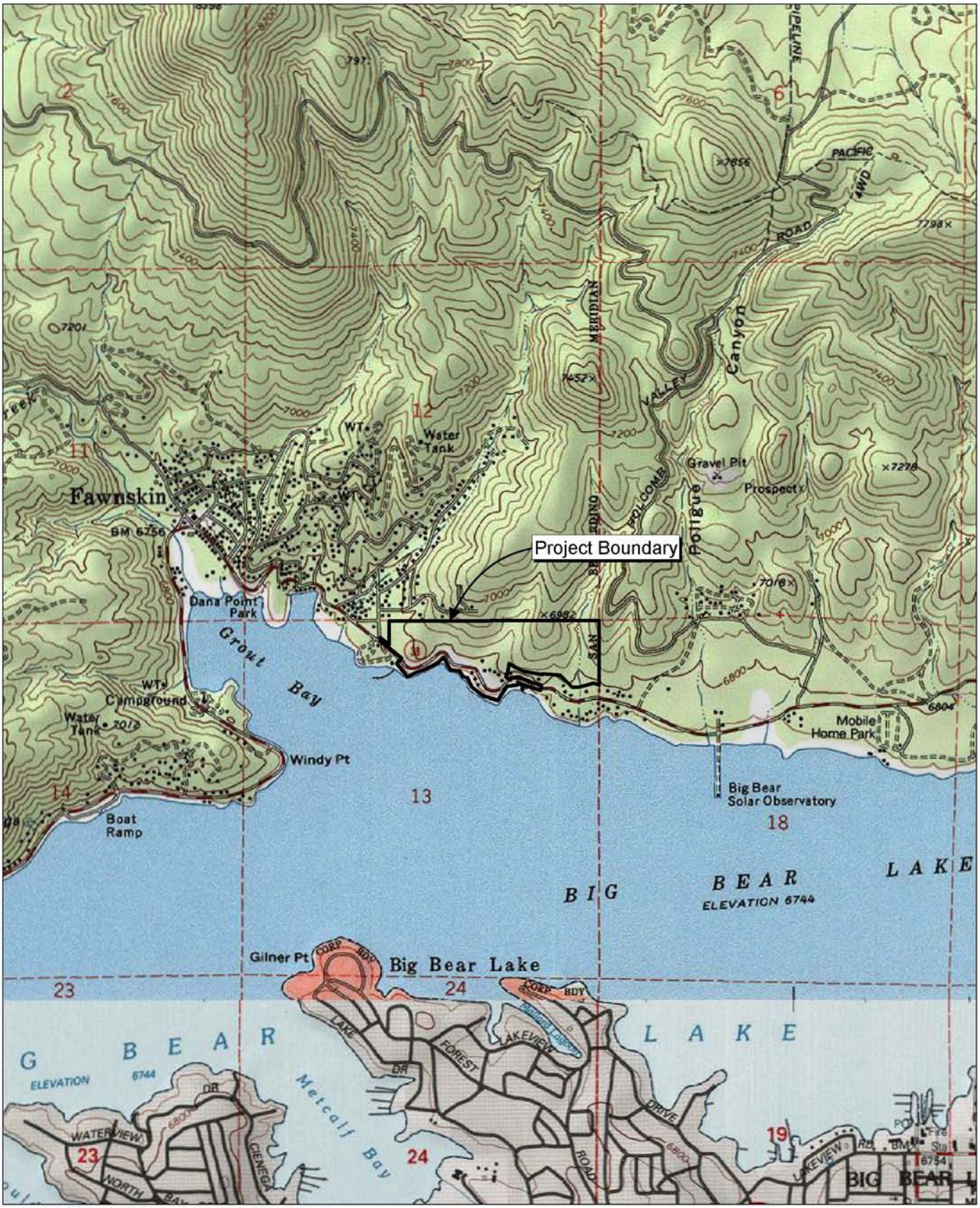
Source: Census 2000 Data, The CaSIL, MBA GIS 2007.

Michael Brandman Associates

NORTH

5 2.5 0 5 Miles

Exhibit 1
Regional Location Map



Source: TOPO! USGS Fawnskin (1996) 7.5' DRG.

NORTH

2,000 1,000 0 2,000

Feet

Michael Brandman Associates

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Exhibit 2
Local Vicinity
Topographic Base

TT 16136 • FAWSKIN, SAN BERNARDINO COUNTY, CA
FLYING SQUIRREL SURVEY REPORT

Source: National Agriculutre Imagery Program, San Bernardino County (2005).

Michael Brandman Associates

NORTH

2,000 1,000 0 2,000

Feet

Exhibit 3
Local Vicinity Aerial Base

00520089 • 08/2007 | 3_aerial_aerial.mxd

TT 16136 • FAWSKIN, SAN BERNARDINO COUNTY, CA
FLYING SQUIRREL SURVEY REPORT

Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches. Approximately 17.38 acres of the Jeffrey pine forest on the site contain few trees and fairly open canopy. The open Jeffrey pine forest and where Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*) occur is suitable habitat for a number of sensitive plant species.

The pebble plain plant community occurs on 0.69 acre of the site north of State Route 38. It appears as a distinct open patch within open Jeffrey pine forest in the western portion of the site. The substrate in this area consists of clay soil mixed with quartzite pebbles and gravel that are continually pushed to the surface through frost action. This substrate supports a high floristic diversity consisting of small cushion-forming plants, tiny annuals, grasses, and succulents that are well spaced, low growing, and sun tolerant. Several sensitive plant species are associated with pebble plain habitat.

Approximately 4.14 acres of the southern boundary of the site is formed by the shore of Big Bear Lake. Plant species along the shore itself consisted primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Vegetation is patchy above the high-water level where small areas of Jeffrey pine forest are interspersed among open meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laviegata*).

2.4 - Disturbances

Recent activity on the project site includes the removal of trees, which appeared to be either taken offsite or chipped onsite. The greatest disturbance from the tree removal activity would be to cavity-dwelling birds and mammals, and sensitive plant species that have been located on the project site, including the Federally-listed Threatened and California Native Plant Society (CNPS) List 1B species, ash-gray Indian paintbrush (*Castilleja cinerea*); and three CNPS List 1B species, Parish's rock cress (*Arabis parishii*), Big Bear Valley woollypod (*Astragalus leucolobus*), and silver-haired ivesia (*Ivesia argyrocoma*). It is not known if precautions prior to tree removal were made to avoid the known locations of these plants. In addition, the ingress and egress of vehicles involved in the tree removal and the potential dragging of trees offsite has caused the understory vegetation and ground to be heavily disturbed. Finally, there appeared to be direct mechanical removal of some understory shrubs. A number of wildlife trees (or snags) were marked with "WL" and were not removed. Some thinning of trees, including black oak (*Quercus kellogii*), was evident, particularly at the lower portions of the tree trunk.

2.5 - San Bernardino Flying Squirrel

2.5.1 - Status

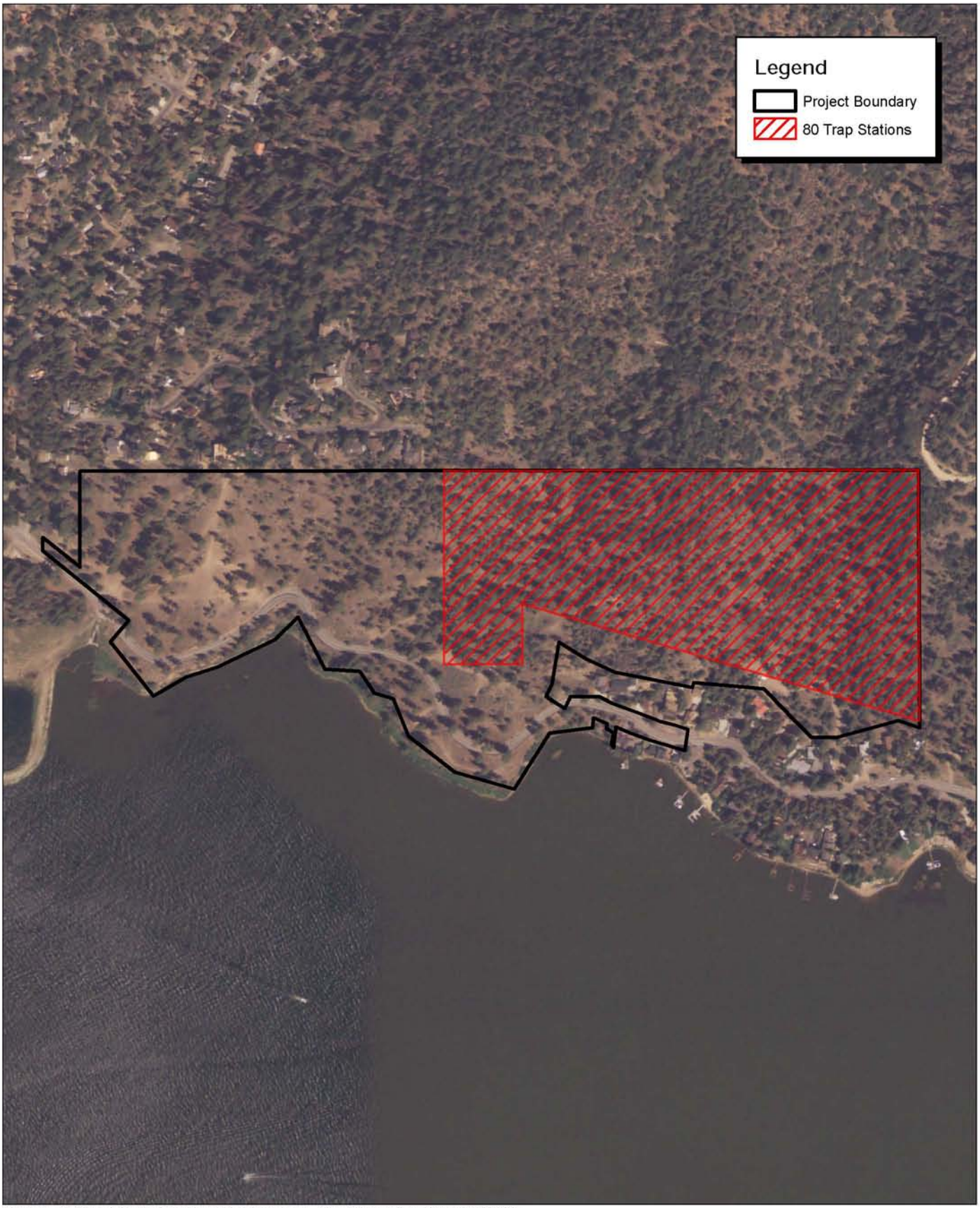
The SBFS is considered a California special concern (CSC) species by the California Department of Fish and Game (CDFG) and is on the Forest Service's sensitive wildlife species list. SBFS is a

sensitive species because of declining population levels, limited ranges, and continuing threats have made them vulnerable to extinction. The goal of designating sensitive species is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long term viability.

2.5.2 - Biology

The SBFS is a subspecies of the northern flying squirrel (*Glaucomys sabrinus*), a small arboreal sciurid found in forested regions over most of North America. They are found typically in habitats dominated by conifers or with a mixed coniferous-deciduous overstory. Stomach and fecal analyses indicate that flying squirrels consume primarily hypogeous fungi (*mycophagists*) during snow-free periods and lichens during winter. A fecal analysis was conducted on SBFS in the San Bernardino Mountains (Butler et al. 1991) showing spores from three genera of hypogeous fungi (*Melanogaster*, *Hymenogastor*, and *Gymnomyces*). Other food items found in descending order of abundance included Jeffrey pine pollen, dicot and monocot plant material, and spores from epigeous fungi (associated with decomposing wood and litter) (Butler et al. 1991). SBFS do not appear to be territorial, and individuals are often seen feeding and denning together. They inhabit two types of nests, those inside tree cavities and those constructed in the canopy of conifers, especially those infected with broom rust (*Chrysomyxa*).

SBFS can occur in Jeffrey pine/white fir mixed conifer forests with some oak components. From the study efforts in the San Bernardino Mountains (Butler et al. 1991; Driessen et al. 1998), habitat at successful trapping sites can be characterized as mature to over-mature mixed conifer forest with relatively high numbers of snags and downed logs. The habitat is relatively open and lacks a dense undergrowth component. The canopy is relatively closed. The dominant species on site were Jeffrey pine and white fir. All sites also had a black oak component in the vegetation mix. The successful trapping sites can also be characterized as having a heavier duff level than surrounding areas. All of the sites also have either ephemeral streams/springs or intermittent streams with some riparian vegetation in close proximity.



Source: National Agriculutre Imagery Program, San Bernardino County (2005).

Michael Brandman Associates

NORTH

500 250 0 500

Feet

Exhibit 4
Flying Squirrel Trapping Grid

00520089 • 08/2007 | 4_flying_squirrel_trapping.mxd

TT 16136 • FAWSKIN, SAN BERNARDINO COUNTY, CA
FLYING SQUIRREL SURVEY REPORT

SECTION 3: METHODOLOGY

MBA biologists Mikael Romich and James Hickman conducted a focused SBFS trapping survey with methods modified from survey protocols issued by the USFWS (1990) and USDA (1991). To evaluate the presence of a SBFS population on the project site, traps were placed within suitable Jeffrey pine forest habitat.

The project site had a live trapping grid consisting of 80 stations located at 40-meter intervals (Exhibit 4). One Tomahawk livetrap (Model 201, Tomahawk Live Trap Company, Tomahawk, Wisconsin) equipped with shelter (plastic container) and batting (polyster fiberfill) was mounted 1.5 meters aboveground on a tree trunk at each trap station. Each trap station was selectively chosen based on the proximity of a suitable tree. The order of preference for trap locations was based on the diameter at breast height (DBH) and the height of the tree: tall dead snag (dead and dying tree) with large DBH, tall alive tree with large DBH, short dead snag with large DBH, and short alive tree with small DBH. Traps were located at each of these categories. Traps were covered with debris, such as pine needles and bark, to break the outline and provide shelter.

Squirrels were live trapped for five nights, from the evening of June 24 when traps were first set to the morning June 29, 2007 when traps were checked and picked up. Traps were set before dark each day and checked the next morning. Traps remained closed during the day. Traps were baited with a mixture of peanut butter, molasses, and whole oats. Prior to the trapping effort, traps were pre-baited with sunflower seeds that were placed on top of the closed trap for a period of three nights (June 21 to June 24, 2007). Pre-baiting allows animals to acclimate to the trap and increases capture success (USFWS 1990). These methods are summarized in Table 1.

Table 1: Summary of 2007 SBFS Trapping Survey at the Moon Camp Project Site

2007 Date	Activity
June 21	Traps placed on site and pre-baited with sunflower seeds in a locked closed position.
June 24	Traps baited with peanut butter mixture and triggered
June 25-June 28	Traps checked in morning and locked shut
June 25-28	Traps opened and triggered each evening
June 29	Traps checked in morning and collected

The timing of this trapping session occurred when SBFS were previously trapped in close proximity to the Site (approximately 0.5 mile north of the northern boundary of the project site); the 1998 survey occurred from June 25 through July 7, 1998 and a total of 6 SBFS were caught, all in Tomahawk traps that were placed on tree trunks (Driessen et al. 1998). Although Carey et al. (1991) recommends a trap placed on the ground, this was not necessary because SBFS were shown to be trappable on tree trunks.

SECTION 4: RESULTS AND DISCUSSION

SBFS was not captured on the project site. Non-target species that were caught included Merriam's chipmunk (*Tamias merriami*) (minimum known to be alive was 10 individuals), two dusky-footed woodrat (*Neotoma fuscipes*), and one Steller's jay (*Cyanocitta stelleri*).

With the presence of a Jeffrey pine/white fir mixed conifer forest, dead and downed woody debris, and snags, the conditions of the site appeared suitable to SBFS. However, the project site had been subject to a disturbance regime (tree and shrub removal activity) that may have affected its suitability for SBFS. Potential impacts of this disturbance regime include: (1) removal of trees with cavities or stick nests needed by SBFS; (2) disturbance of the substrate could reduce the quantity and quality of hypogeous (underground) fungi (truffles), which compose northern flying squirrel diets at this time of the year (Ransome and Sullivan 2004; Butler et al. 1998)). It should be noted that this trapping session occurred during a drought year, which would reduce fungal production (Villa et al. 1999) and result in a lower abundance of SBFS as they are known to be primarily limited by the availability of food resources (Ransome and Sullivan, 1997, 2004). Due to these confounding factors, mitigation measures are proposed in Section 5 that would reduce potential impacts if the survey area becomes occupied by SBFS in the future.

SECTION 5: CONCLUSION

No SBFS were trapped during this focused survey effort, which provides reasonable evidence that SBFS were absent from the project site during the period trapped. Although the USFWS (1990) recommends that an area be trapped during more than one season, it is not mandatory. However, due to the suitability of the habitat and proximity of trapping records approximately 0.5 mile to the north (Driessen et al. 1998), the Site may receive seasonal use by SBFS that would not be detectable with this survey. The following mitigation measures are recommended to minimize potential impacts to SBFS that could be seasonally using the site:

1. Minimizing the number of trees, snags, and downed wood removed for project implementation;

2. Having a biologist qualified with SBFS as a monitor during tree removal;

3. Compensating the removal of snags containing cavities; this would be achieved by constructing and erecting two nest boxes and one aggregate box per snag removed. Appendix B provides the specifications of the nest and aggregate boxes (Flying Squirrels 2007). These boxes should be located on the adjacent USFS land (with their permission) and the locations marked with a global positioning system. This locations of the boxes shall be provided to the USFS so that their biologists could monitor the boxes for occupation by SBFS.

4. Adjacent night lighting shall be reduced to the greatest extent practicable and lights shall be designed with hoods or shields that reduce the amount of light spilling into the adjacent habitat, particularly on the northern edge; and

5. Provide new homeowners with a flyer that would provide information on the biology of SBFS and how they are susceptible to depredation by cats. The flyer would also outline steps that homeowners could take to reduce their urban edge effects.

SECTION 6: CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: September 18, 2007 Signed: _____

Mikael Romich, TE068799-1

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Appendix A: Nest and Aggregate Box Specifications

Simple Nesting Box Plan for the Northern Flying Squirrel

(Glaucomys sabrinus)

[for Southern Flying Squirrel (Glaucomys volans) take one inch off all dimensions. Access hole must be exactly 1.25 in. (3.175 cm). Place in deciduous or mixed forest.]

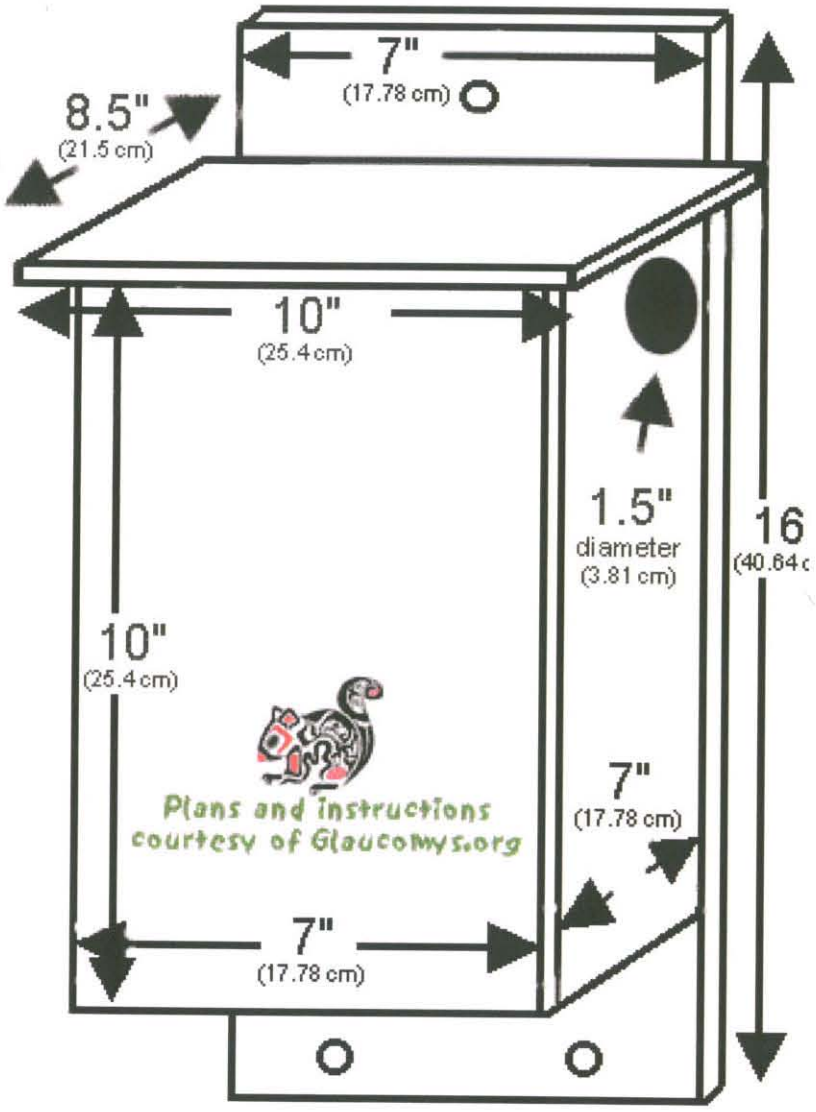
*Note - before beginning construction of this nesting box, do your research and confirm which species of flying squirrel inhabits your geographic region!

1. Ensure access hole size is no larger than specified. You may wish to install a sheet metal occluder around entrance to prevent hole enlargement by unwanted species. No sharp edges!

2. Run a bead of water-based siliconized caulking along length of top where it meets backing board to prevent water infiltration and seal all cracks and gaps accordingly. Drill (4) 1/2" (12.7mm) holes near corners of bottom and (2) 1/2" (12.7mm) holes on each side near bottom for ventilation purposes.

3. Use natural (untreated) softwood ONLY. Thickness - 3/4" (19mm) to 1" (25mm). DO NOT stain or paint interior or exterior. DO NOT use plywood or chipboard. Wear gloves when handling wood, as salt from sweaty hands will encourage porcupines to chew the box.

4. If the wood you use is smooth-planed, roughen exterior and interior panels with rasp or coarse sandpaper for better "gripability".



5. Though not absolutely necessary, it is advisable to provide a hinged access door for cleaning purposes. Clean ONLY during January or February, as box will be vacant during this period. Front or side door access is preferred over top door access. Only adults should do the cleaning, and always wear leather gardening gloves when performing a clean-out! Some other animals you might find using this nesting box are: birds, tree frogs, spiders, hornets, bumblebees and deer/white-footed mice.

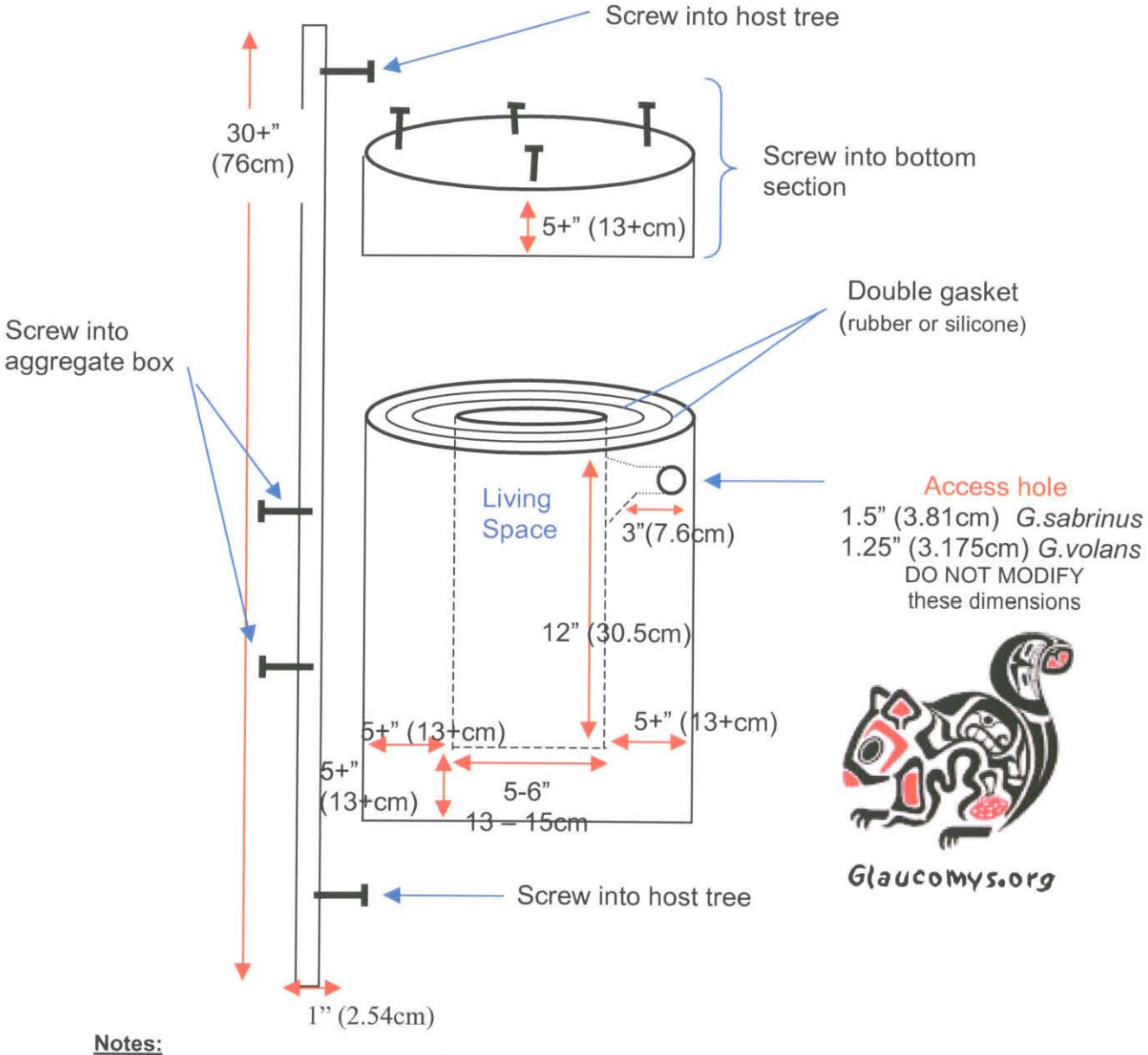
Place nesting boxes in your oldest stands of coniferous (preferred by sabrinus) or mixed forest. Min./Max. placement height is 10'/26' (3m/8m). Place so that access hole faces opposite prevailing wind. Preferably, place so that mammalian predators cannot reach box via limbs of other trees. Should arboreal snakes inhabit the area, drill another access hole at bottom of opposite side. Install within 500m of water (marsh, creek, etc.) or in mesic (wet) forest areas where possible. Install several boxes per 1/2 hectare, as flying squirrels need to have alternate nesting sites available to them for predator/parasite avoidance and rest/elimination purposes.

Monitor occasionally for occupancy by rapping or scratching tree trunk and watching access hole. If you find a flying squirrel has taken up residence, leave it alone. If you bother it too much, it will leave.

The most important feature of your nesting box is that it be waterproof. Please ensure that the inside of the nesting box will remain dry. DO NOT install any nesting boxes if you are aware of house cats (cared-for or feral) in the vicinity.

**BUILDING, PLACING AND CLEANING OF NESTING BOXES CAN BE DANGEROUS.
ALL WORK DETAILED HERE SHOULD BE PERFORMED ONLY UNDER ADULT SUPERVISION.**

Flying Squirrel Aggregate Box Plans



Notes:

1. Unit is made from one section of log, nominally 22" (56cm) in length, 16" (40.5cm) dia.
2. Dimensions given (except access hole diameters) are approximate and are dependant upon source log dimensions - use as a guide only.
3. Softwoods are easier to work with (building and placing). Use chainsaw to create living space. Leave bark on unit, if possible. If not, roughen exterior surface.
4. Place unit between 10' (3m) and 20' (6m) high, away from branches of other trees.
5. Place unit so that entrance hole faces away from prevailing wind.
6. Place unit so that entrance hole faces away from direct sunlight.
7. Clean unit yearly (when unoccupied - watch for active bumblebee and hornet nests!).
8. All screws should be non-rusting; countersunk, Robertson type preferred.
9. Avoid using plywood as backing board; if unavoidable, use exterior grade plywood.

A.4 - Southwestern Willow Flycatcher Focused Survey Report (Michael Brandman Associates, August 2007)

SOUTHWESTERN WILLOW FLYCATCHER FOCUSED SURVEY REPORT MOONCAMP PROJECT, FAWNSKIN, SAN BERNARDINO COUNTY, CALIFORNIA

Prepared for:

County of San Bernardino
Department of Land Use Services
385 N. Arrowhead Avenue, First Floor
San Bernardino, California 92415-0182

Contact: Matthew W. Slowick, Senior Planner

Prepared by:

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August 15, 2007

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SECTION 1: SUMMARY

This report contains the findings of Michael Brandman Associates (MBA) focused survey for the southwestern willow flycatcher (*Empidonax traillii extimus*) (SWF) on an approximately 62.5-acre property known as Tentative Tract 16136 (Moon Camp) located in the Community of Fawnskin, San Bernardino County, California. This focused survey determined that the project site is not currently occupied by SWF. However, due to various bird species utilizing the site for nesting, project-related tree removal should occur outside the nesting season (March through July).

SECTION 2: INTRODUCTION

At the request of San Bernardino County, MBA conducted a focused SWF survey consistent with accepted survey protocols issued by the US Fish and Wildlife Service (USFWS 2000) for a 62.5-acre property located in the Community of Fawnskin, San Bernardino County, California. This property is hereinafter referred to as project site or site.

2.1 - Project Location

The project site is located in the San Bernardino National Forest, north of Big Bear Lake. State Highway 38 bisects the site on the southern portion. The project site is located south of Flicker Road, east of Oriole Lane, and west of Polique Canyon Road, in the unincorporated community of Fawnskin, San Bernardino County, California (Exhibits 1 and 2). The site consists of Assessor's Parcel Numbers 0304-082-04, 0304-091-12, -13, and -21. It is within sections 7 and 12, Township 2 North and Range 1 East of the Fawnskin U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Exhibit 3).

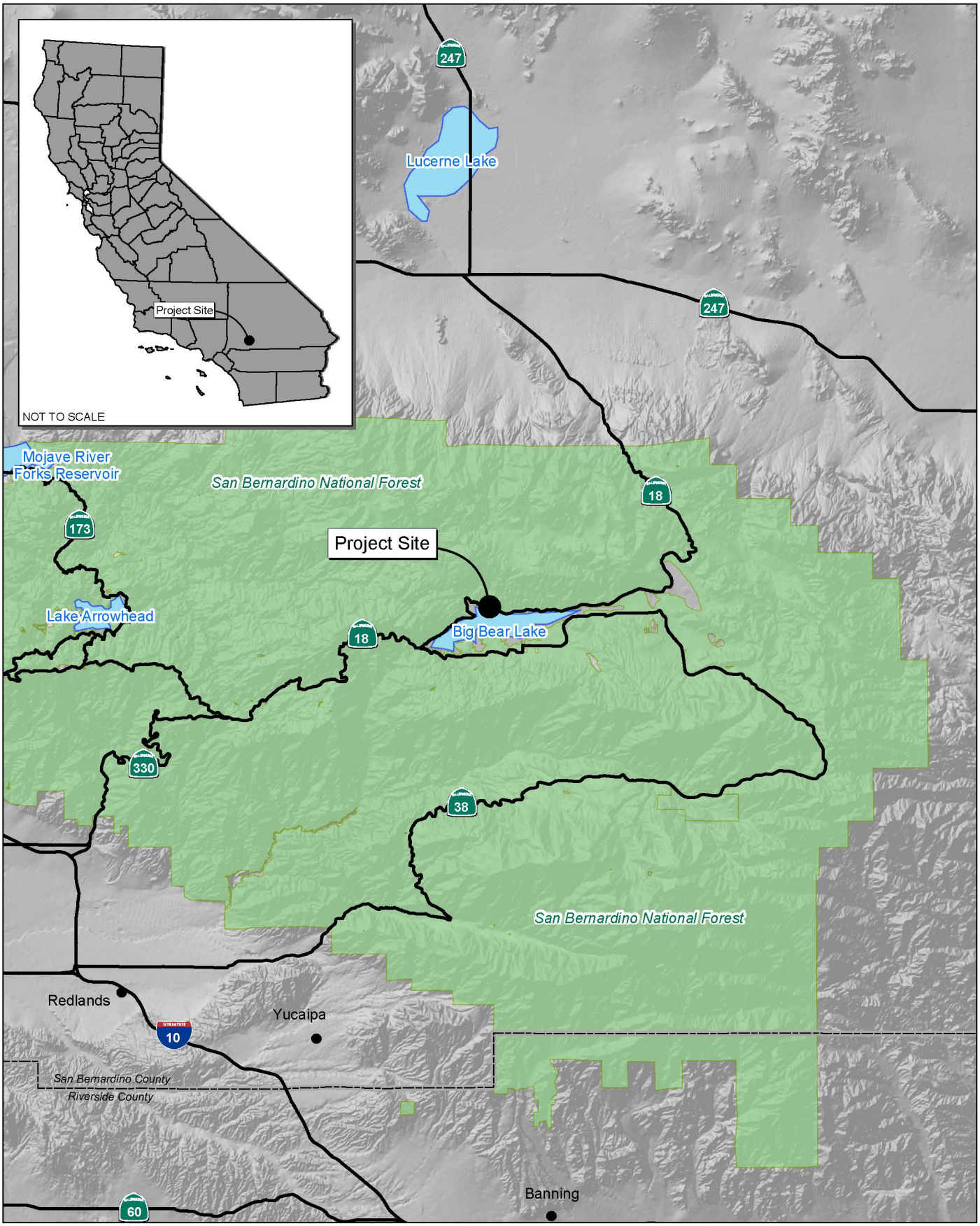
2.2 - Project Description

The proposed project is to subdivide the site into 53 lots: fifty residential lots to be sold individually and developed into custom homes and 3 lettered lots, two of which would be designated as Open Space/Conservation easements.

2.3 - Environmental setting

In addition to SR 38, several dirt roads and trails traverse the project site. Site elevations range from approximately 6,747 feet above mean sea level (msl) at the lakeshore to 6,960 feet above msl at the northeast corner of the site. Individual slopes on-site range from five percent to forty percent. Slope orientation is generally from north to south toward the lake, except for three natural ravines on the project site that contain eastern and western slopes.

The dominant plant community observed on the project site is Jeffrey pine forest (54.91 acres), which includes Jeffrey pine (*Pinus jeffreyi*), white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak occurring at lower densities. The Jeffrey pine forest onsite is unevenly aged composed of approximately 85 percent Jeffrey pine, eight percent western juniper, six percent singleleaf pinyon pine, and less than one percent of scattered white fir and black oak. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), Greg's ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl leaf mountain mahogany (*Cercocarpus ledifolius*).



Source: Census 2000 Data, The CaSIL, MBA GIS 2007.

Michael Brandman Associates

NORTH

5 2.5 0 5 Miles

Exhibit 1
Regional Location Map

Source: TOPO! USGS Fawnskin (1996) 7.5' DRG.

Exhibit 2
Local Vicinity
Topographic Base

NORTH

2,000 1,000 0 2,000 Feet

Michael Brandman Associates

00520089 • 08/2007 | 2_local_topo.mxd

TT 16136 • FAWSKIN, SAN BERNARDINO COUNTY, CA
SOUTHWESTERN WILLOW FLYCATCHER FOCUSED SURVEY REPORT

Source: National Agriculutre Imagery Program, San Bernardino County (2005).

Michael Brandman Associates

NORTH

2,000 1,000 0 2,000

Feet

Exhibit 3
Local Vicinity Aerial Base

00520089 • 08/2007 | 3_aerial_aerial.mxd

TT 16136 • FAWSKIN, SAN BERNARDINO COUNTY, CA
SOUTHWESTERN WILLOW FLYCATCHER FOCUSED SURVEY REPORT

Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches. Approximately 17.38 acres of the Jeffrey pine forest on the project site contain few trees and fairly open canopy. The open Jeffrey pine forest and where Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*) occur is suitable habitat for a number of sensitive plant species.

The pebble plain plant community occurs on 0.69 acre of the project site north of State Highway 38. It appears as a distinct open patch within open Jeffrey pine forest in the western portion of the Project site. The substrate in this area consists of clay soil mixed with quartzite pebbles and gravel that are continually pushed to the surface through frost action. This substrate supports a high floristic diversity consisting of small cushion-forming plants, tiny annuals, grasses, and succulents that are well spaced, low growing, and sun tolerant. Several sensitive plant species are associated with pebble plain habitat.

Approximately 4.14 acres of the southern boundary of the project site is formed by the shore of Big Bear Lake. Plant species along the shore itself consist primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Vegetation is patchy above the high-water level where small areas of Jeffrey pine forest are interspersed among open meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laviegata*). This plant community provided the only potentially suitable habitat on the project site for southwestern willow flycatcher.

2.4 - Disturbances

Recent activity on the project site includes the removal of trees, which appeared to be either taken off-site or chipped onsite. The greatest disturbance from the tree removal activity would be to cavity-dwelling birds and mammals, and sensitive plant species that have been located on the project site, including the Federally-listed Threatened and California Native Plant Society (CNPS) List 1B species, ash-gray Indian paintbrush (*Castilleja cinerea*); and three CNPS List 1B species, Parish's rock cress (*Arabis parishii*), Big Bear Valley woollypod (*Astragalus leucolobus*), and silver-haired ivesia (*Ivesia argyrocoma*). It is not known if precautions prior to tree removal were made to avoid the known locations of these plants. In addition, the ingress and egress of vehicles involved in the tree removal and the potential dragging of trees offsite has caused the understory vegetation and ground to be heavily disturbed. Finally, there appeared to be direct mechanical removal of some understory shrubs. A number of wildlife trees (or snags) were marked with "WL" and were not removed. Some thinning of trees, including black oak (*Quercus kellogii*), was evident, particularly at the lower portions of the tree trunk.

2.5 - Southwestern Willow Flycatcher

The SWF is an insectivorous migratory songbird that nests during the late spring and summer months in dense riparian habitats. The SWF is one of four subspecies of willow flycatcher (WIFL) that occupy relatively distinct breeding ranges in the continental United States. The breeding range of the SWF occurs in the southwestern region of the states (primarily southern California, Arizona, New Mexico, and portions of Nevada, Utah, and Colorado). SWF breeds in dense riparian vegetation near surface water or saturated soil. The other subspecies of WIFL may nest in shrubby habitats away from water. Habitat loss and brood parasitism by the brown-headed cowbird have been attributed to the decline of this species. The SWF is listed as an endangered species by the State of California (2000) and USFWS (1995). The nearest citing of southwestern willow flycatcher occurred in 2001 on Big Bear Lake in the vicinity of Boulder Bay and Metcalf Bay, California Natural Diversity Database (CNDDB 2007). The project site does not overlap designated critical habitat for SWF (USFWS 2005).

SECTION 3: METHODOLOGY

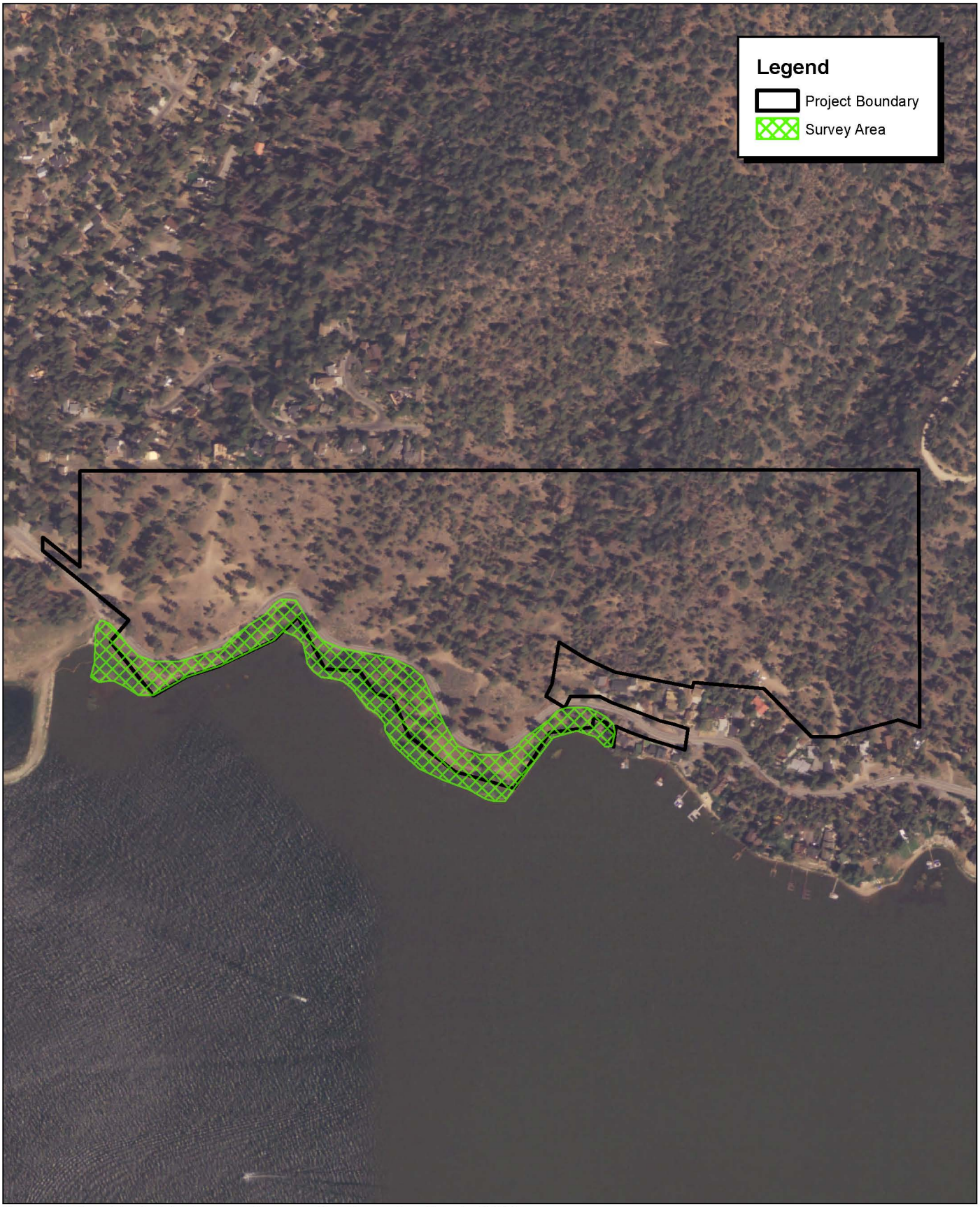
Michael Brandman Associates (MBA) permitted biologist Mikael Romich (TE068799-2) conducted the SWF surveys according to USFWS survey guidelines. To determine the presence/absence of SWF, surveys were conducted within all suitable and potential habitats on the project site. All suitable habitat (see Exhibit 4) occurs along the lakeshore and was surveyed as noted below in Table 1.

Southwestern willow flycatcher protocol requires a total of five (5) surveys between May 15 and July 17. One survey is completed May 15 to May 31; the second survey is completed June 1 to June 21; and three surveys are completed June 22 to July 17. These methods are consistent with the USFWS southwestern willow flycatcher protocol revision (2000). Surveys may begin at dawn and end at approximately 10:30 a.m, as consistent with the SWF protocol developed by Sogge *et al.* (1997).

The surveying biologist methodically moved through the survey area and, when feasible and appropriate, walked within potential habitat patches. The survey protocol included the use of taped recordings of SWF played approximately every 50 feet to elicit responses. If a flycatcher was detected, tape playing was discontinued. All bird species observed during the surveys were noted and are listed in Appendix A. Table 1 summarizes the dates, times, and weather conditions of all SWF surveys.

Table 1: Summary of 2007 SWF Surveys at the Moon Camp Project Site

2007 Date Surveyed	Time	Temperature, wind	Weather
May 31	6:00-8:00	35 F, calm	clear
June 13	7:30-9:00	46 F, calm	clear
June 24	6:30-8:00	42 F, calm	clear
July 3	6:00-7:30	43 F, calm	clear
July 13	5:45-7:15	40 F, calm	clear



Source: National Agriculutre Imagery Program, San Bernardino County (2005).

Michael Brandman Associates

NORTH

500 250 0 500

Feet

Exhibit 4
Focused Survey Area

SECTION 4: RESULTS AND DISCUSSION

4.1 - Southwestern Willow Flycatcher

No detections of SWF or WIFL occurred during the surveys at the Moon Camp project site. In fact, there were no detections of even common riparian obligate species. The lack of riparian bird species suggests that the habitat is not suitable to SWF. In general, the willows along the shoreline are patchy and lack the dense growth or willow thicket favored by this species. In addition, there is little vertical complexity to the riparian habitat on the project site.

4.2 - Bald Eagle

Although not the focus of this survey effort, a sighting of bald eagle (*Haliaeetus leucocephalus*) occurred on June 13, 2007 where an adult was observed flying along the shoreline of the project site in an east to west direction. Bald eagles have recently been delisted as a federally threatened and endangered species by the USFWS (July 9, 2007), but remain a California state endangered species. Bald eagles are known to winter on the project site (Bon Terra Consulting 2002), but breeding records in the Big Bear Lake area are scarce. However, in 2007 two bald eagle nests with potentially two pair of bald eagles were located in the Big Bear Lake area (Forest Service, June 25, 2007). One of these nests was located near Grout Bay, which is just west of the project site. Considering the amount of bald eagle use the project site receives during the winter, it would be conceivable that a nest could be established in one of the larger snags located in the interior of the site, which also affords a view of Big Bear Lake. Future studies should include nesting bald eagle surveys of the project site to ensure they have not established a nest onsite. The two nests in 2007 were discovered on February 9 and April 19, respectively. Copulation between two of the eagles was observed on March 5 and March 12. Therefore, nesting visits should be conducted in March, April, and May to confirm the continued absence of nesting bald eagle on the project site.

SECTION 5: CONCLUSION

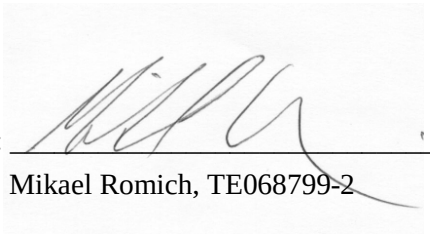
No SWF were detected during this focused survey effort and the site is not occupied by this species. Future short-term occupation of the project site by SWF is unlikely due to the general absence of suitable habitat for this species. Additional focused surveys would not be required unless the habitat becomes more suitable for this species. No impacts to SWF would occur with implementation of the proposed project.

A bald eagle was observed flying over the southern portion of the project site. Due to nesting records from 2007 in the Big Bear Lake area, nesting surveys should be conducted in March, April, and May to confirm the continued absence of nesting bald eagle on the project site.

There are a large number of bird species that were observed to use the project site for nesting. Due to the difficulty locating nests of cavity-nesting and other species of birds, a preconstruction nesting bird survey is not feasible. Therefore, the project should time tree removal to occur outside of the nesting period for birds, generally February through July.

SECTION 6: CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: August 15, 2007 Signed: 

Mikael Romich, TE068799-2

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Appendix A: Avian Species List

APPENDIX A
AVIAN SPECIES LIST

Family/Species Name	Common Name
BIRDS	
Gaviidae	**Divers, Loons**
Gavia immer	common loon
Podicipedidae	**Grebes**
Aechmophorus occidentalis	western grebe
Podiceps nigricollis	eared grebe
Podilymbus podiceps	pie-billed grebe
Ardeidae	**Egrets, Herons & Bitterns**
Ardea herodias	great blue heron
Anatidae	**Swans, Geese & Ducks**
Aix sponsa	wood duck
Anas platyrhynchos	mallard
Anas strepera	gadwall
Rallidae	**Rails and Coots**
Fulica americana	American Coot
Accipitridae	**Kites, Hawks, Eagles & Vultures**
Buteo lineatus	red-shouldered hawk
Haliaeetus leucocephalus	bald eagle
Falconidae	**Falcons**
Falco sparverius	American kestrel
Ciconiidae	**American Vultures**
Cathartes aura	turkey vulture
Phasianidae	**Pheasants, Partridges & Quail**
Oreortyx pictus	mountain quail
Scolopacidae	**Sandpipers**
Actitis macularia	spotted sandpiper
Charadriidae	**Plovers**
Charadrius vociferus	killdeer
Columbidae	**Pigeons & Doves**
Zenaida macroura	mourning dove
Picidae	**Woodpeckers**
Colaptes auratus	northern flicker
Melanerpes formicivorus	acorn woodpecker
Picoides pubescens	downy woodpecker
Picoides villosus	hairy woodpecker

Family/Species Name	Common Name
Tyrannidae	**Tyrant Flycatchers**
Contopus sordidulus	western wood-peewee
Hirundinidae	**Swallows**
Tachycineta thalassina	violet-green swallow
Corvidae	**Crows, Jays**
Corvus corax	common raven
Cyanocitta stelleri	Steller's jay
Paridae	**Titmice**
Poecile gambeli	mountain chickadee
Aegithalidae	**Bushtit**
Psaltriparus minimus	common bushtit
Sittidae	**Nuthatches**
Sitta pygmaea	pygmy nuthatch
Troglodytidae	**Wrens**
Thryomanes bewickii	Bewick's wren
Turdidae	**Thrushes**
Turdus migratorius	American robin
Sialia mexicana	western bluebird
Sturnidae	**Starlings**
**Sturnus vulgaris*	European starling
Vireonidae	**Vireos**
Vireo cassinii	Cassin's vireo
Fringillidae	**Finches, Grosbeaks, Sparrows**
Agelaius phoeniceus	red-winged blackbird
Carpodacus mexicanus	house finch
Euphagus cyanocephalus	Brewer's blackbird
Junco hyemalis	dark-eyed junco
Pipilo chlorurus	green-tailed towhee
Pipilo erythrophthalmus	spotted towhee
Spizella passerina	chipping sparrow

A.5 - Peer Review of Existing Biological Documents (Michael Brandman Associates, January 2007

Michael Brandman Associates

ENVIRONMENTAL SERVICES • PLANNING • NATURAL RESOURCES MANAGEMENT

January 31, 2007

Matthew W. Slowick, Senior Associate Planner
County of San Bernardino Land Use Services Dept.
385 N. Arrowhead Avenue, First Floor
San Bernardino, CA 92415-0182

Subject: Site Assessment and Review of Previously Prepared Biological Documentation of the Proposed Moon Camp Tentative Tract (TT) 16136 Project Site near Fawnskin, San Bernardino County, California

Dear **Mr**. Slowick:

The following is the results of a field assessment and peer review of existing biological documents for the Moon Camp TT 16136 project near Fawnskin in San Bernardino County.

Introduction

As requested by the County of San Bernardino, Michael Brandman Associates (MBA) completed a professional peer review of biological investigations and previously prepared biological documents concerning the approximately 64-acre subject property, known as the Moon Camp TT 16136 in San Bernardino County, California. The purpose of this task was to confirm that the appropriate professional practices were observed and to identify any deficiencies of information that could affect the adequacy of the environmental impact report we are preparing for this project.

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MBA's review methods, findings, and recommendations are presented below.

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After reviewing the reports listed above, along with a copy of the proposed tentative tract map, MBA biologist Marnie McKernan conducted a field survey of the site on December 15, 2006. The site was surveyed by vehicle and on foot. The survey was completed to verify conditions at the project site, evaluate habitat for suitability for sensitive species and to better understand potential impacts of the proposed project. The visit was not intended as a focused survey or a comprehensive inventory of the site.

Findings

Habitat Assessment and Peer Review

The site occurs on the north shore of Big Bear Lake near the community of Fawnskin. The project site sits on a south facing slope with an elevation ranging from 6,745 feet above mean sea level (msl) at the shoreline to 6,982 feet msl at the northern boundary.

The biological conditions at the site in December 2006 were consistent with the findings of the 2002 and 2003 reports prepared by BonTerra Consulting. In general, the site has remained undisturbed since the reports were prepared and still reflects the conditions outlined in those studies. The only noticeable physical change to the site is to the continued growth of the willow scrub habitat along the shoreline.

Based on MBA's field observations, we have determined that the previous BonTerra investigations accurately described the vegetation communities found onsite, and accurately identified the species of concern that are known or likely to occur within the habitats found onsite.

MBA concurs with the list of species determined to have a moderate potential to occur on the project site. One additional species that MBA recommends including on the list is the San Bernardino flying squirrel. This species is a State and San Bernardino National Forest (SBNF) Species of Special Concern. During the site assessment, MBA determined that the northern half of the site supports habitat suitable for this species. In researching this species, MBA learned that trapping efforts in 1991 for the flying squirrel by Forest Service biologists in the Fawnskin area showed a relatively high success rate (Butler et al. 1991).

Bald Eagle

The focused bald eagle survey and report by BonnTerra concluded that the project site and vicinity (Grout Bay) are very important to wintering populations of bald eagles. In fact, the report goes on to point out that one particular perch tree onsite is considered the most commonly recorded used perch tree on the north shore of Big Bear Lake. A review of several years of wintering bald eagle counts conducted by the SBNF and volunteers in the Big Bear Valley confirm that wintering bald eagles routinely use the Moon Camp site for perching.

The BonnTerra report indicated that the project site contains several perch trees used by the eagles which are primarily located adjacent to the shoreline and within 100 feet north and south of the highway. After making a site visit and consulting with a Forest Service biologist knowledgeable with the populations of bald eagle in the Big Bear Basin, MBA concluded that the entire project site likely provides suitable perch

trees for the bald eagle. Because the site is located on a moderately steep hill, the trees along the project's northern boundary provide perches with a lake view, one of the requirements of bald eagle perch trees. During the site visit, the MBA biologist, as well as the Forest Service biologist, observed a juvenile bald eagle perched in a tree on the northeast corner of the site.

The BonnTerra report recommended that all known perch trees, and those greater than 20 inches in diameter at 4 feet from the ground and within approximately 200 yards of the high water line, be avoided during construction and preserved in place. This recommendation was used as mitigation in the Draft EIR. This may conflict with the general rule of Caltrans, San Bernardino County and other agencies with jurisdiction in this immediate area to cut down large trees within falling distance to the highway, homes or any structure if there is obvious sign of dying (such as limb loss) to prevent damage to property or life. Many of the perch trees onsite are in the process of dying and their removal could be considered detrimental to the biological value of this area and to the bald eagle.

Because the data documenting the use of the Moon Camp site are fairly robust (SBNF, BonnTerra, and others), additional focused surveys are not recommended.

Sensitive Plants

The focused botanical survey was conducted in May and June of 2002 and a follow up survey in November 2002. Results of the survey indicate that that five special status plant species and one special status vegetation community occur on the project site: Parish's rock-cress (*Arabis parishii*), Big Bear Valley woollypod (*Astragalus leucolobus*), ash-gray Indian paintbrush (*Castilleja cinerea*), Heckards paintbrush (*Castilleja applegateii ssp),*silver-haired ivesia (*Ivesia argyrocoma*), and Pebble Plain. The survey report cautioned however that due to the very dry conditions onsite caused by poor rainfall years, many of the plants with a moderate to high potential to occur onsite could not be conclusively determined to be present or absent from the site during the focused surveys. Additional focused plant surveys are needed to determine whether the following sensitive plants occur onsite.

- Rock sandwort (*Arenaria lanuginosa* ssp. *saxosa*);
- Big Bear Valley sandwort (*Arenaria ursine)*;
- Crested milk-vetch (*Astragalus bicristatus)*;
- Big Bear Valley milk-vetch (*Astragalus lentiginosus* var. *Sierrae*;
- Palmer's mariposa lily (*Calochortus palmeri* var. *Palmeri*);
- San Bernardino Mountain owl's clover (*Castilleja lasiorhyncha)*;
- San Bernardino Mountains dudleya (*Dudleya abramsii* ssp. *affinis*);
- Leafy buckwheat (*Eriogonum foliosum*);
- Jepson's bedstraw (*Galium jepsonii*);
- Johnston's bedstraw (*Galium johnsttonii*);
- Duran's rush (*Juncus duranii*);
- Short-sepaled lewisia (*Lewisia brachycalyx*);
- Baldwin Lake linanthus (*Linanthus killipii*);
- San Bernardino Mountain monkeyflower (*Mimulus exiguous*);
- Purple monkeyflower (*Mimulus purpureus* var. *purpureus*);
- Chickweed oxytheca (*Oxytheca caryophylloides*);
- Parish's yampah (*Perideridia parishii* ssp. *parishii*);
- Transverse Range phacelia (*Phacelia exilis*);

- Mojave phacelia (*Phacelia mohavensis*);
- Bear Valley phlox (*Phlox dolichantha*);
- San Bernardino bluegrass (*Poa atropurpurea*);
- Bear Valley pyrrocoma (*Pyrrocoma uniflora* ssp. *Gossypina*);
- Parish's rupertia (*Rupertia rigida*);
- Bird's foot checkerbloom (*Sidalcea pedata*);
- Prairie wedge grass (*Sphenopholis obtusata*);
- Laguna Mountains jewelflower (*Streptanthus bernardinus*);
- Southern jewelflower (*Streptanthus campestris*);
- Pine green-gentian (*Swertia neglecta*);
- California dandelion (*Taraxacum californicum*); and
- Small-flowered bluecurls (*Trichostema micranthum*).

Two separate days of surveying are recommended; one during the height of flowering and one near the end to capture the full extent of the blooming period

Southern Rubber Boa

Focused southern rubber boa (SRB) surveys were conducted in the suitable habitat within the eastern portion of the Moon Camp project site during May-August 2002 with negative results. The report by BonnTerra concluded that the SRB is not expected to occur onsite for three reasons; because of the negative results of their focused surveys, the lack of historical records for the immediate project area and the lack of rock outcrops that appear to be an important component of occupied habitat.

The draft survey guidelines developed by the CDFG for SRB includes three years of repeated intensive active searches before determination of absence can be made. Intensive active searches of suitable habitat for SRB are similar to the visual encounter survey method described by Crump and Scott (1994) in which a subsample of sites exhibiting high value habitat within the site as a whole are surveyed intensively for presence. The draft guidelines allow for negative finding in less than 3 years (2 years) if trapping is conducted. Trapping consists of the use of a system of pitfall traps connected to drift fences, known as arrays, to capture SRB.

The BonTerra focused surveys consisted of a combination of both survey techniques conducted simultaneously to maximize the probability of detecting SRB. Because the surveys were conducted for just the one season, the negative results cannot conclusively determine that SRB are absent from the project site. MBA concluded during their December assessment that the eastern portion of the Moon Camp site contains suitable habitat (well-developed soils, leaf litter accumulation, downed logs, and large rocks) for SRB. An additional habitat assessment and/or SRB focused surveys are needed to adequately characterize this species' presence or absence from the project site.

Southwestern Willow Flycatcher

Focused willow flycatcher surveys were conducted for the Moon Camp project during the breeding season of 2002 according to the USFWS protocol (USFWS 1997, revised 2000). The surveys were conducted on five separate days between May and July. Surveys were conducted in the willow habitat along the shoreline at the southern edge of the project site. Results of the surveys were negative. The focused survey report concluded that the site did not contain suitable territorial or breeding habitat since "the willows are patchy and lack the dense growth or willow thicket required by the SWF." Focused

surveys for SWF were conducted 5 years ago. Since that time, the willow habitat onsite has grown and matured, thereby providing better opportunities for the SWF to occupy the site. Focused SWF surveys are recommended to determine their presence/absence from the Moon Camp site.

Spotted Owl

Focused surveys for the spotted owl were conducted on the Moon Camp project site and adjacent areas during the breeding season of 2002. Surveys were conducted at night on six occasions by walking predetermined survey routes designed to provide thorough survey coverage of the area. No spotted owls were detected onsite during the focused surveys. One male spotted owl was detected and later observed at its roost approximately 1 mile from the Moon Camp project site during the surveys. In discussions with a Forest Service biologist concerning the need for additional spotted owl surveys, MBA learned that the SBNF has been conducting surveys for spotted owl throughout the forest, including the immediate vicinity of Moon Camp. No known spotted owl nest, home range or activity center occurs on the Moon Camp site. Enough information on this species and their locations is available and is annually updated by the SBNF. Additional surveys for the spotted owl are not needed.

Recommendations

The following additional focused surveys are recommended for the Moon Camp TT 16136 project site for the 2007 survey season.

- San Bernardino flying squirrel;
- Southwestern willow flycatcher;
- Southern rubber boa; and
- Sensitive plants.

Should you have any further questions regarding this project please do not hesitate to contact me at (909) 884-2255.

Sincerely,

Marnie McKernan

Marnie McKernan, Project Manager/Biologist
Michael Brandman Associates
621 E. Carnegie Drive, Suite 100
San Bernardino, CA 92408

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A.6 - Peer Review of Existing Biological Documents (Michael Brandman Associates, February 2007

Michael Brandman Associates

ENVIRONMENTAL SERVICES • PLANNING • NATURAL RESOURCES MANAGEMENT

February 7, 2007

Matthew W. Slowick, Senior Associate Planner
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Recommendations

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- Sensitive plants.

Should you have any further questions regarding this project please do not hesitate to contact me at (909) 884-2255.

Sincerely,

Marnie McKernan

Marnie McKernan, Project Manager/Biologist
Michael Brandman Associates
621 E. Carnegie Drive, Suite 100
San Bernardino, CA 92408

MSM:sep
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A.7 - Draft Vegetation and Special Status Plants Survey (Scott White Biological Consulting, August 2007)

MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

PRELIMINARY DRAFT: August 2007

Prepared for:
Michael Brandman Associates
621 E. Carnegie Dr., Suite 100
San Bernardino, CA 92408

Prepared by:
Scott D. White
SCOTT WHITE BIOLOGICAL CONSULTING
201 North First Ave., No. 102
Upland, CA 91786

Project site location: USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1 West, portion of Section 13.
APN:
Owner /Applicant:
Principal Investigator: Scott D. White, Scott White Biological consulting (above).

CERTIFICATION: I hereby certify that the statements furnished in this report and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me and under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.

DRAFT REPORT ONLY

DATE: _____ SIGNED: _____
Scott D. White, Report Author

Additional field work performed by:

DATE: _____ SIGNED: _____
Justin Wood

MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

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Appendix 1: Special Status Species Not Addressed
Appendix 2: Special Status Species
Appendix 3: Species List

Attachment 1: Project Map
Attachment 2: California Natural Diversity Data Base query results
Attachment 3: California Natural Diversity Data Base report forms

MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

Scott D. White
SCOTT WHITE BIOLOGICAL CONSULTING
PRELIMINARY DRAFT: July 2007

I: SUMMARY

The Moon Camp property supports two sensitive plant communities (Pebble Plain and meadow habitats), one federally listed plant species (ash-gray Indian paintbrush) and four State Species of Special Concern (Parish's rock-cress, Big Bear Valley woollypod, Heckard's paintbrush, and silver-haired ivesia). Project development is expected to have both direct and indirect impacts to these sensitive biological resources. Several recommendations are discussed to minimize these impacts.

II: PROJECT AND PROPERTY DESCRIPTION

The San Bernardino County Planning Department is reviewing an application for residential development on the former Moon Camp site in Fawnskin. The project site is on the north shore of Big Bear Lake, in the eastern part of Fawnskin, in unincorporated San Bernardino County. It is about 62 acres, on both sides of State Highway 38, between Oriole Lane and Polique Canyon Road (on the Fawnskin USGS 7½' quadrangle map, in the north half of Section 13, Township 2N and Range 1W). The project site slopes from north to south. Elevation ranges from 6,960 feet in the northeastern portion of the site to 6,750 feet near the lakeshore (see Exhibits 1 and 2).

The project site occurs within an area that is described by the Open Space element of San Bernardino County's General Plan as, "This area includes the entire watershed area of Big Bear Lake, and contains a number of specialized habitat areas, which support a large number of endangered plants and animals (as well as commonly occurring mountain species). Habitat values here should be maintained, potentially by controlling development to prevent damage to important habitat areas."

This report addresses the potential presence of twp special status plant communities and several sensitive plant species occurring or potentially occurring on the property.

III. FOCUSED STUDY / SPECIES OF CONCERN

There are four federally listed threatened or endangered plant species endemic to meadows and three federally listed threatened or endangered plant species endemic to "pebble plain" habitat in the Big Bear Valley area of the northern San Bernardino Mountains (USDI Fish and Wildlife Service 1984, 1998). In addition, there are numerous other special status plant species occurring in this area (Appendix 2). This report focuses on the following plant species:

Exhibit 1: TBD

Exhibit 2: TBD

Meadow Species:

- San Bernardino bluegrass (*Poa atropurpurea*) (federally endangered);
- Bird-foot checkerbloom (*Sidalcea pedata*) (federally and state endangered);
- California dandelion (*Taraxacum californicum*) (federally endangered); and
- Slender-petaled thelypodium (*Thelypodium stenopetalum*) (federally endangered).

Pebble Plain Species:

- Bear Valley sandwort (*Arenaria ursina*) (federally threatened);
- Ash-gray Indian paintbrush (*Castilleja cinerea*) (federally threatened); and
- Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*) (federally threatened).

Previous surveys of the Project Site identified ash-gray Indian paintbrush as present on the site (Michael Brandman Associates 2000; White & Leatherman BioServices 2002). White and Leatherman (2002) also mapped the extent of suitable habitat for ash-gray Indian paintbrush, based on the extent of its host plant, Wright's matting buckwheat. Bear Valley sandwort was reported as occurring on the site in the California Natural Diversity Data Base (California Department of Fish and Game 2007).

IV. METHODS

Available literature relative to special status plants or plant communities known from the project site and vicinity were reviewed. Literature sources included previous biological reports (Michael Brandman Associates 2000; White & Leatherman BioServices 2002), the California Natural Diversity Data Base (California Department of Fish and Game 2007a, USGS Fawnskin, Big Bear City, Big Bear Lake, Butler Peak, Keller Peak, and Moonridge 7½' topographic quads), California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (Tibor 2001), the CNPS *Electronic Inventory* (2007, for the same quads) and compendia of special status species published by the US Fish and Wildlife Service (2006) and California Department of Fish and Game (2007b). All species identified by this literature review, and others known from the general region, are included in Appendix 1 or 2 (attached). Appendix 1 lists those species not considered for this report due to elevational or geographic ranges, or specialized habitat requirements not found on the site. Appendix 2 lists special status species known from comparable habitats in the region and summarizes their natural history, conservation status, and occurrence probability onsite.

Scott D. White and Justin Wood (Scott White Biological Consulting) surveyed pebble plains habitat found on the site on 30 April, 7 June, and 8 August 2007. All plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in Hickman (1993), Munz (1974), Abrams (1923-1960), and other regional references. All species noted on the site are listed in Appendix 3.

Surveys were conducted in conformance with California Department of Fish and Game guidelines (2000), during flowering seasons for the above listed special status plants. It should be noted that very low rainfall in 2006-2007 and surveys may not be conclusive for all annual plants.

Maps produced previously by White and Leatherman BioServices (2002) of the pebble plain habitat and open upland habitat supporting Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*) were used as base maps for this study.

V. RESULTS

Due to the drought conditions, the authors used previous reports and their own judgment of habitat quality to estimate the probability that each special status plant might occur on the site.

A. PLANT COMMUNITIES

The following two plant communities were dominant plant communities found on the site:

Jeffrey Pine Forest

Most of the site above Highway 38 is covered by the Jeffrey pine series (Sawyer and Keeler-Wolf 1995). This vegetation also matches descriptions of Jeffrey pine forest (Holland 1986; McBride 1988), and montane coniferous forest (Munz 1959). Jeffrey pine forest covers most of the eastern half of the project site and occurs in patches interspersed with pebble plains (below) in the western half (see Exhibit 3). Jeffrey pine (*Pinus jeffreyi*) is the dominant tree; white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occur throughout Jeffrey pine forest, at lower densities. The understory is sparse, consisting of scattered shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), cupleaf ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbes in scattered patches. Jeffrey pine forest occurs in mountains throughout most of California at elevations between about 5000 and 9000 feet. Many local and regional associations have been described (Sawyer and Keeler-Wolf 1995).

Shoreline Habitats

Most plants along the shore itself are herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium ciliatum*), wire-grass (*Juncus arcticus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Numerous seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*) also occur there.

Just above the high-water level, there are small patches of various upland and wetland vegetation types. These patches are too small to map. Small areas of Jeffrey pine forest are interspersed open wet meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*). There are no alkaline meadow or dry meadow habitats (below) along the lake shore.

Sensitive Plant Communities

In addition to the above common plant communities, two sensitive plant communities were identified on the project site. Exhibit 3 shows the location of each of these sensitive plant communities.

Exhibit 3: TBD

Pebble Plain Plant Community

Pebble plain plant community occurs on XX acres within the western portion of the site north of Highway 38. This habitat occurs in smaller patches to the east (see Exhibit 3). The Pebble plain plant community (also called pavement plain) was described by Derby and Wilson (1978, 1979). A detailed discussion was prepared by the San Bernardino National Forest (1990) and brief descriptions appear in Holland (1986) and Sawyer and Keeler-Wolf (1995). This plant community is characterized by an underlying layer of clay soil with quartzite pebbles and gravel that are continually pushed to the surface, evidently through frost action (Holland 1986). Vegetation structure on these sites is similar to the mat-forming structure of alpine sites at much higher elevations. Vegetation consists largely of well-spaced cushion-forming perennials and a variety of tiny annuals. Bunchgrasses and some succulents may also occur. At least two species, both listed as endangered, are endemic to the Big Bear pebble plain plant community: Bear Valley sandwort and southern mountain buckwheat (Derby and Wilson 1978).

On the Moon Camp site, much of the pebble plain habitat has been disrupted by vehicle use on the site. This disturbance has reduced vegetation cover, disturbed the natural hydrologic pattern, and perhaps reduced habitat quality for the sensitive pebble plain plant species (San Bernardino National Forest 1990). The Forest Service has determined that vehicle disturbance does not permanently alter habitat suitability for these species. The Forest Service has fenced degraded pebble plains in the Sugarloaf area and found that plant diversity returns after a few years.

The pebble plain plant community onsite has been classified as "southern montane black sagebrush pebble plains" by CDFG (2002). This plant community is "a series or association considered rare and worthy of consideration" by the California Natural Diversity Data Base.

Meadow Habitats

Small patches of dry and wet meadows occur along the lakeshore, south of Highway 38. They grade into upland grasslands, and we could not delineate their extent due to dry conditions. Meadows in the Big Bear Valley may be perennially saturated (i.e., "wet meadows") or may have saturated soils only seasonally or during wet years (called "dry meadows," "xeric meadows," or "vernal meadows"). Meadows of the San Bernardino Mountains were described by Krantz (1994). They are generally dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.) and grasses (*Poa* spp., *Elymus* spp.). Dry meadows and the margins of wet meadows support sagebrush (*Artemisia tridentata, A. rothrockii*). These meadows themselves are not ranked as special status communities by CDFG (2002) but several locally endemic plants occur in them and they, therefore, are recognized locally as important habitats (Krantz, no date).

B. SENSITIVE PLANT AND WILDLIFE SPECIES

Big Bear Valley has a high proportion of rare and locally endemic species (Krantz, no date; Krantz 1994). All of these species are addressed in Appendix 1 or 2 (habitat and range, agency status and probability of occurring on the site). Only those species potentially occurring on the site (see Appendix 2) are discussed below.

Listed Threatened or Endangered Plants Identified on the Site

Ash-gray Indian paintbrush (*Castilleja cinerea*): Ash-gray Indian paintbrush is a federally-listed threatened species and is on CNPS's List 1B. It is a root parasite on other plants, often parasitizing the listed threatened southern Mountain buckwheat (below) or a similar but common mat-forming

buckwheat (*E. wrightii* ssp. *subscaposum*). It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows and seeps, and open pinyon or Jeffrey pine forest between about 5,900 and 10,000 feet elevation. It is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). It was mapped on the project site by Michael Brandman Associates (2000) and in the California Natural Diversity Data Base (2007). This survey confirmed these occurrences and noted no substantial changes to densities or distribution in 2007.

Sensitive Plants Occurring on the Site

Parish's rock-cress (*Arabis parishii*): Parish's rock cress is CNPS's List 1B. It is a perennial herb that typically blooms in April or May. It occurs in pebble plains, and other sites with heavy or rocky soils, including carbonate soils, within pinyon woodlands and montane forests between about 3,900 and 8,000 feet elevation. It is endemic to the San Bernardino Mountains. Suitable habitat occurs on the project site in areas shown on Exhibit 3. This survey confirmed its presence onsite and noted no substantial changes to densities or distribution in 2007.

Big Bear Valley woollypod (*Astragalus leucolobus*): Big Bear Valley woollypod is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in rocky soils of montane conifer forests and woodlands and pebble plains, between about 5,600 and 8,000 feet elevation. It is endemic to the high mountains of southern California (San Bernardino, San Gabriel, San Jacinto, and Santa Rosa Mountains). Suitable habitat is found throughout the site. White & Leatherman BioServices (2002) observed it occasionally throughout the project site. This survey confirmed these occurrences and noted that it was especially common on pebble plains in 2007.

Heckard's paintbrush (*Castilleja montigena, C. applegateii* ssp. *martinii*): Heckard's paintbrush is on CNPS's List 4. It is a perennial herb, typically flowering between May and August. It occurs in montane forests between about 6,400 and 9,200 feet elevation. It is endemic to the San Bernardino Mountains, where it is common in forest habitats throughout the mountain range. It was originally described by Lawrence Heckard (1980), but Heckard regarded it as a minor variant of *Castilleja applegateii* and not as a distinct species in his Jepson Manual treatment of the genus (1993). This survey found it occurring occasionally in Jeffery pine forest on the Moon Camp site.

Silver-Haired Ivesia (*Ivesia argyrocoma*): Silver-haired ivesia is on CNPS's List 1B. It is a perennial herb that typically blooms between June and August. It occurs in alkaline meadows and seeps, pebble plains, and montane forest between about 4900 and 8800 feet elevation. It occurs in the San Bernardino Mountains and a disjunct site in the mountains of Baja California. It was reported on the project site by Michael Brandman Associates (2000) and White and Leatherman BioServices (2002). This survey observed it throughout the pebble plain habitat (Exhibit 3).

Listed and Candidate Threatened or Endangered Plants Potentially Occurring on the Site

Bear Valley sandwort (*Arenaria ursina*): Bear valley sandwort is a federally-listed as threatened and is on CNPS's List 1B. It is a perennial herb and typically blooms from May to August. It occurs in pebble plains and sometimes in carbonate soils, between about 6,400 and 6,900 feet elevation. It is endemic to Big Bear Valley in the San Bernardino Mountains. It has been reported from the Moon Camp site (CNDDB 2007), but was not observed in 2007 nor was it observed by Michael Brandman Associates (2000) or White & Leatherman BioServices (2002). Due to poor rainfall in 2006-07, this survey could not evaluate whether Bear Valley sandwort was present or absent from

the site. Suitable habitat occurs in pebble plains on the project site, and this survey determined that there is a high probability of it occurring onsite.

Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*): Southern mountain buckwheat is federally listed as threatened and is on CNPS's List 1B. It is a mat-forming woody perennial, generally flowering late in the season (between about June and August). It is endemic to pebble plains habitats in Big Bear and Holcomb valleys in the San Bernardino Mountains, between about 5,800 and 7,500 feet elevation. It often serves as a host plant for the hemi-parasitic *Castilleja cinerea* (above) and also is a food plant for a newly described locally-endemic San Bernardino blue butterfly. It is very similar to a more common Wright's matting buckwheat (*E. wrightii* ssp. *subscaposum*), which is common on the project site. The two species are distinguished by presence or absence of branching in their inflorescences (Hickman 1993; Reveal 1989, 2005). We examined flowers and remains of dried inflorescences of mat-forming buckwheats throughout the project site on each site visit. Most of them were either unidentifiable (due to absence of inflorescences) or were identified as Wright's matting buckwheat, based on their branching inflorescences. Within the mapped pebble plain habitat, about 10-20% of the matting buckwheat plants had mostly unbranched inflorescences during the 8 August site visit. Reveal (2005) noted that the two plants intergrade to some extent in Big Bear Valley and A. Sanders (pers. comm.) has made similar observations. It was concluded that some of the matting buckwheats on pebble plains at the Moon Camp site are intergradations between the endangered southern mountain buckwheat and the common Wright's matting buckwheat.

San Bernardino bluegrass (*Poa atropurpurea*): San Bernardino bluegrass is a federally listed endangered species and is on CNPS's List 1B. It is a rhizomatous perennial grass that typically flowers between May and June. It occurs in mesic meadows and seeps between about 4,400 and 8100 feet elevation. It is known only from the San Bernardino Mountains and Laguna mountains (San Diego County). Although marginally suitable habitat occurs along the lakeshore areas on the project site, San Bernardino bluegrass was not observed onsite. Based on habitat, it was concluded there is a low probability that it may occur there.

Bird's foot checkerbloom (*Sidalcea pedata*): Bird's foot checkerbloom is a federally- and state-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in meadows and seeps, between about 5,200 and 8,100 feet elevation. It is endemic to the San Bernardino Mountains. Although marginally suitable habitat occurs near the lakeshore, bird's foot checkerbloom was not observed during field surveys. It was not reported as occurring in previous surveys. Based on habitat, it was concluded that there is a low probability that it may occur.

California dandelion (*Taraxacum californicum*): California dandelion is a federally-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It is endemic to the San Bernardino Mountains, occurring only in and around Big Bear Valley, in meadows and seeps between about 6,300 and 7,800 feet elevation. Although marginally suitable habitat occurs in meadow areas near the lakeshore, the species was not observed during the surveys or reported in prior surveys. Based on habitat, it was conclude that there is a low probability that it may occur onsite.

Sensitive Plants Potentially Occurring Onsite

Although not observed during the survey, the following sensitive plant species were judged as having a moderate or high probability of occurring onsite:

Table 1
Sensitive Plant Species Having a Moderate or High Probability of Occurring Onsite

Species	Scientific Name	Probability	Location
Rock sandwort	*Arenaria lanuginosa* ssp. *saxosa*	Moderate probability	meadow, lakeshore
Crested milk vetch	*Astragalus bicristatus*	High probability	rocky areas
Big Bear Valley milk vetch	*Astragalus lentiginosus* var. *sierrae*	High probability	open forest
Palmer's mariposa lily	*Calochortus palmeri* var. *palmeri*	Moderate probability	meadow
Western sedge	*Carex occidentalis*	Moderate probability	meadow
San Bernardino Mountain owl's clover	*Castilleja lasiorhyncha*	Moderate probability	meadow
San Bernardino Mountains dudleya	*Dudleya abramsii* ssp. *affinis*	Moderate probability	pebble plains
Southern Sierra woolly sunflower	*Eriophyllum lanatum* var. *obovatum*	High probability	forest
Jepson's bedstraw	*Galium jepsonii*	High probability	forest
Johnston's bedstraw	*Galium johnstonii*	Low to moderate probability	forest
Parry's sunflower	*Hulsea vestita* ssp. *parryi*	Low to moderate probability	open slopes
Duran's rush	*Juncus duranii*	Moderate probability	meadow
Short-sepaled lewisia	*Lewisia brachycalyx*	Moderate probability	meadow
Baldwin Lake linanthus	*Linanthus killipii*	High probability	pebble plains
San Bernardino Mountain monkeyflower	*Mimulus exiguus*	High probability	meadow margin, etc.
Purple monkeyflower	*Mimulus purpureus*	High probability	meadow margin, etc.
Chickweed oxytheca	*Oxytheca caryophylloides*	High probability	open forest
Parish's yampah	*Perideridia parishii* ssp. *parishii*	Low to moderate probability	meadow
Transverse Range phacelia	*Phacelia exilis*	High probability	meadow margin, etc.
Mojave phacelia	*Phacelia mohavensis*	High probability	meadow margin, etc.

Table 1 (Cont.)
Sensitive Plant Species Having a Moderate or High Probability of Occurring Onsite

Species	Scientific Name	Probability	Location
Bear Valley phlox	*Phlox dolichantha*	High probability	throughout
Bear Valley pyrrocoma	*Pyrrocoma uniflora* ssp. *gossypina*	Low - moderate probability	meadow
Parish's rupertia	*Rupertia rigida*	High probability	throughout
Tehachapi ragwort	*Senecio ionophyllus*	Moderate probability	throughout
Laguna Mountains jewelflower	*Streptanthus bernardinus*	Moderate probability	forest
Southern jewelflower	*Streptanthus campestris*	High probability	forest
Pine green-gentian	*Swertia neglecta*	High probability	Forest
Small-flowered bluecurls	*Trichostema micranthum*	High probability	meadow

C. SAN BERNARDINO COUNTY PROTECTED PLANTS

The San Bernardino County Native Plant Protection policy (1989) regulates removal of trees greater than 6 inches diameter at breast height (dbh), smoke trees, mesquite, creosote rings, and all plants in the agave family, including Joshua trees. Although there are no smoke trees, mesquite, creosote rings or species in the agave family that occur on property, Jeffrey pines and other native forest trees greater than 6 inches dbh do occur onsite. An arborist survey and report on these trees is recommended.

VI. IMPACTS

A. IMPACTS TO SPECIAL STATUS PLANTS AND HABITAT

Project construction includes grading new roads, driveways and building pads throughout most of the property, and the loss of some of the native vegetation. Pebble plains and open forest patches on the site are occupied by at least one threatened or endangered plant (ash-gray Indian paintbrush) and four other sensitive but unlisted plant species (Parish’s rock-cress, Heckard’s paintbrush, Bear Valley woollypod and silver-haired ivesia). Development could eliminate or substantially reduce the populations of all five plant species populations. Although these habitats are somewhat degraded by vehicles and invasive plants, adverse impacts to listed species would meet the CEQA threshold for mandatory findings of significance.

Similarly, development could eliminate or substantially reduce the populations of five other listed plants that potentially occur on the site but were not identified during previous surveys. These species include Bear Valley sandwort, southern mountain buckwheat, bird-foot checkerbloom, San Bernardino bluegrass, and California dandelion. Impacts to any of those species, if present, would meet the CEQA threshold for mandatory findings of significance if any of these listed plants occur on the site.

Impacts to the sensitive but unlisted plants listed in Table 1 generally would not meet the CEQA threshold for mandatory findings of significance.

VII. RECOMMENDATIONS

A. AGENCY CONSULTATION OR FURTHER STUDIES

To minimize loss of forest canopy on the property, we recommend that an arborist map and inventory trees on the site, and designing roads and building sites to minimize the number of overstory trees to be removed. Once those trees that must be removed are identified, we recommend applying to San Bernardino County for applicable permits under the County's native plant protection policy.

B. MITIGATION MEASURES

1. Additional Surveys

Surveys of wet meadow habitat near the lakeshore should be repeated to determine presence or absence of the listed threatened or endangered species whose presence or absence could not be determined this year. If the surveys determine that one or more listed species occurs in the meadow area, then additional compensation will be required.

2. Avoidance or Minimization

Avoiding or minimizing impacts to sensitive plant habitat is the preferred mitigation measure. However, this mitigation measure would likely reduce project feasibility. It may not provide long-term conservation of the listed plants due to the isolation that will result from project development.

3. Off-site Compensation

Off-site compensation is an available mitigation measure for impacts to ash-gray Indian paintbrush and the pebble plain habitat. The San Bernardino National Forest actively manages to preserve pebble plain habitat, including areas supporting ash-gray paintbrush. There are numerous privately-owned sites in the Big Bear Valley that support pebble plain that could be purchased and managed for conservation. In addition, the California Wildlife Foundation has established a fund, administered by the California Department of Fish and Game, for the purchase and conservation of pebble plain habitat in the Big Bear area.

It is recommended that the anticipated loss of a federally listed threatened plant (ash-gray Indian paintbrush) and pebble plain habitat be mitigated by contributing to the funding of purchase and management of off-site habitat through the California Wildlife Foundation fund. It is anticipated that mitigation will be required at 3:1 ratio.

4. Onsite Management

Impacts to the pebble plains habitat and sensitive plants will be minimized by the project's design, which will place the pebble plain area, particularly the area occupied ash-gray Indian paintbrush habitat, into a permanently protected open space. The long-term conservation value of the proposed open space requires active onsite land management to prevent "edge effects" from

existing and proposed new adjacent land uses. Exhibit 4 shows these areas on the project site that would be expected to be subject to edge effects.

The following discussion of edge effects on rare plants is based on an analysis by the Conservation Biology Institute (2000) addressing San Fernando Valley spineflower, an endemic southern California species threatened by development and surrounding land uses in the Santa Clarita Valley. Sensitive plants found near developed lands tend to die out due to a variety of edge effects, including:

- Exclusion by invasive weedy plants introduced deliberately or accidentally into developed landscapes;
- Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation.
- Altered hydrology caused by irrigation overspray, road runoff, or water diversions installed for erosion control;
- Direct damage by pets and feral animals (e.g., digging by dogs and cats);
- Indirect effects of non-native animals, such as elimination of native pollinators by invasive Argentine ants;
- Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes; and
- Pollution from over-sprayed or runoff landscaping chemicals (insecticides, herbicides, fertilizers).

Conservation planners can design "buffer areas" to separate managed sensitive species or habitat areas from the indirect effects from adjacent land uses. Roads, trails, or fuel modification land uses were not considered consistent with buffer function. The Conservation Biology Institute analysis (2000) estimated that buffer widths of 200 feet would be "highly likely to be effective" in buffering sensitive plant occurrences from a series of adverse edge effects from adjacent land uses.

Most land surrounding the proposed Moon Camp site is in private ownership, except in the northeastern corner where National Forest land is adjacent to the north and east. None of the surrounding private land is managed as either a buffer area or for conservation. Most of the adjacent land has been developed and would not be available for conservation or a buffer area. The proposed project will be subject to substantial edge effects from adjacent residential development and roads, especially Highway 38 (see Exhibit 4).

IX. CONCLUSION

Two sensitive plant communities (Pebble Plain and meadow habitats) occur on the project sites. These two plant communities support an array of endemic plant species, including the federally threatened ash-gray Indian paintbrush and four plant species of special concern (Parish's rock-cress, Big Bear Valley woollypod, Heckard's paintbrush, and silver-haired ivesia). Development of the project site is expected to result in direct and indirect impacts to the sensitive plant communities and associated endemic plant species. Several recommendations are made to help minimize these impacts.

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Appendix 1: Special Status Species Not Addressed

Appendix 1: Special Status Plants of the Bear Valley Region Not Addressed Due to Habitat or Range

Common name	Latin name	Reason for exclusion
White-margined everlasting	*Antennaria marginata*	Outside geogr. range (only local occurrences in Barton Flats area)
Pinyon rock-cress	*Arabis dispar*	Outside geogr. range (only local occurrences on desert-facing slopes)
Shockley's rock-cress	*Arabis shockleyi*	Outside geogr. range (only local occurrences on desert-facing slopes)
Cushenbury milk-vetch	*Astragalus albens*	No suitable habitat (carbonate)
Triple-ribbed milk-vetch	*Astragalus tricarinatus*	No habitat (desert shrubland), well above elev. range (below about 4000 ft.), Cushenbury Cyn report erroneous
Parish's small-scale	*Atriplex parishii*	No suitable habitat (alkali sink)
Fremont barberry	*Berberis fremontii*	No local occurrences (presumed extinct in Cushenbury area)
Scalloped moonwort	*Botrychium crenulatum*	No suitable habitat (marshes, bogs)
Plummer's mariposa lily	*Calochortus plummerae*	Above elev. range (below about 5500 ft.)
Alkali mariposa lily	*Calochortus striatus*	No habitat (desert alkaline meadows, seeps) above elev. range (below about 5300 ft.)
Parish's daisy	*Erigeron parishii*	No suitable habitat (carbonate)
Cushenbury buckwheat	*Eriogonum ovalifolium var. vineum*	No suitable habitat (carbonate)
Moss gentian	*Gentiana fremontii*	Well below elev. range (occurs in San Gorgonio Wilderness)
Los Angeles sunflower	*Helianthus nuttallii ssp. parishii*	Well above elev. range (below about 4000 ft. elev.)
Barton Flats horkelia	*Horkelia wilderae*	Outside geogr. range (endemic to Barton Flats area)
California satintail	*Imperata brevifolia*	Well above elev. range (below about 3000 ft.)
San Bernardino Mtn. bladderpod	*Lesquerella kingii ssp. bernardinus*	No habitat (carbonate)
Adder's mouth	*Malaxis monophyllos ssp. brachypoda*	Well below elev. range (occurs in San Gorgonio Wilderness)
Cienega Seca oxythexca	*Oxytheca parishii var. cienegensis*	Outside geogr. range (known only from Cienega Seca and Pipes Cyn areas)
Cushenbury oxytheca	*Oxytheca parishii var. goodmaniana*	No habitat (carbonate)
Frosted mint	*Poliomintha incana*	No suitable habitat (desert dunes and sandy flats)
Narrow-leaved cottonwood	*Populus angustifolia*	No San Bernardino Mountain occurrences (local reports unverified)
Latimer's woodland gilia	*Saltugilia latimeri*	No habitat (desert shrubland,pinyon woodland); above elev. range (below about 6200 ft.)
Slender-petaled thelypodium	*Thelypodium stenopetalum*	No habitat (alkaline meadows)

Appendix 2: Special Status Species

Appendix 2: Special Status Species Potentially Occurring on the Project Site

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Abronia nana ssp. *covillei* Coville's dwarf abronia	Perennial herb; carbonate and sandy soils within pinon-juniper woodlands; San Bernardino Mts. and mountains of E Mojave, about 5,200 - 10,200 ft.	May -August	Fed: none Calif: S3.2 CNPS List 4.2	Low (marginally suitable habitat)
Allium parishii Parish's onion	Bulb; open shrubland & woodland, gen. sandy bajadas or mtn slopes, often carbonate soil, about 3000 – 5,500 ft. elev.; N San Bern Mtns and Moj Des Mtns, to W Ariz.	Apr - May	Fed: none Calif: S3.3? CNPS List 4.3	Minimal (above elev. range)
Arabis parishii Parish's rock cress	Perennial herb; pebble plains, occas. on carbonate soil; open dry sites in conifer forest; about 5,800 – 9,500 ft. elev.; San Bernardino Mtns. endemic	April - May	Fed: none Calif: S2.1 CNPS List 1B. 2	Occurs (2007 survey; NDDB report)
Arenaria lanuginosa ssp. *saxosa* (*A. confusa*) Rock sandwort	Perennial herb; sandy soils, streams or meadows; about 5900 to 8600 ft. elev.; San Bernardino Mtns, W US and N Baja Calif.	July - Aug	Fed: none Calif: S1.3 CNPS List 2.3	Moderate (moderately suitable habitat)
Arenaria ursina Bear Valley sandwort	Perennial herb, pebble plains, occas. on carbonate soils, about 5,900 – 9,500 ft. elev.; San Bernardino Mtns. endemic	June - July	Fed: THR Calif: S 2.1 CNPS: List 1B.2	Occurs? (NDDB record #23)
Aster bernardinus (*Symphyotrichum defoliatum*) San Bernardino aster	Perennial herb; wetlands and margins, near sea level to about 6,700 ft. elev.; formerly widespread, Kern Co to San Diego Co, but most sites extirpated	July - Nov	Fed: none Calif: S 3.2 CNPS List 1B.2	Low (field surveys; upper margin of elev. range)
Astragalus bicristatus Crested milk vetch	Perennial herb; rocky slopes, montane conifer forest; about 5,500 – 9,000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	May - August	Fed: none Calif: S3.3 CNPS List 4.3	High (suitable habitat occurs)
Astragalus lentiginosus var. *sierrae* Big Bear Valley milk vetch	Perennial herb; open rocky soils or compacted areas in pine forest; about 5,900 – 8,500 ft. elev.; San Bernardino Mtns endemic	April - August	Fed: none Calif: S1? CNPS List 1B.2	High (suitable habitat occurs)
Astragalus leucolobus Bear Valley woollypod	Perennial herb; open or disturbed soils, pine forests and sagebrush scrub, about 5,600-8,800 ft. elev.; San Gabriel Mtns to Santa Rosa Mtns	May - July	Fed: none Calif: S 2.2 CNPS List 1B.2	Occurs

Appendix 2: Special Status Species Potentially Occurring on the Project Site

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Calochortus palmeri vars. *palmeri* and *munzii* Palmer's & Munz's mariposa lilies	Bulb; meadows or seasonally moist sites; about 3,300 – 7,200 ft. elev.; var. *palmeri* occurs S Coast & Transverse Ranges, reported but not verified San Jacinto Mtns; var. *munzii* endemic to San Jacintos, reported but not verified in San Bernardinos	May - July	Fed: none CNPS List 1B.2 var *palmeri*: Calif: S 2.1 var. *munzii*: Calif: S 1.2	Moderate (marginally suitable habitat)
Carex occidentalis Western sedge	Rhizomatous perennial; meadows & seeps; San Bernardino Mtns, White Mtns, scattered in western states; about 6,200 - 10,300 ft. elev.	June - Aug	Fed: none Calif: S2S3 CNPS List 2.3	Moderate (marginal habitat)
Castilleja cinerea Ash-gray Indian paintbrush	Perennial herb; pebble plains, dry meadows, about 5,900 to 9,100 ft. elev.; partially parasitic usually on matting buckwheats; San Bernardino Mtns endemic	May - August	Fed: THR Calif: S2.2 CNPS List 1B.2	Occurs (field survey and CNDDB report)
Castilleja lasiorhyncha (*Orthocarpus lasiorhynchus*) San Bernardino Mountain owl's clover	Annual; meadows, streamsides, seeps, etc., about 4,200-7,800 ft. elev.; San Bernardino Mtns. and (historically) San Jacinto Mtns.; reports from San Diego Co. unconfirmed	June - Aug	Fed: none Calif: S2.2 CNPS List 1B.2	Moderate (marginal habitat)
Castilleja applegateii ssp. *martinii* H *C. angustifolia* (=*C. montigena, C. martinii* var. *ewanii*) Heckard's paintbrush	Perennial herb; conifer forest; San Bernardino Mountains endemic (treated as a species by CNPS but considered a hybrid by Chuang & Heckard in Jepson Manual)	March - July	Fed: none Calif: S3.3 CNPS List 4.3	Occurs (Jeffrey pine forest)
Dryopteris filix-mas Male fern	Perennial herb; widespread in N hemisphere, esp. at high latitudes; only two reports in Calif., incl. Holcomb Valley	July - Sept.	Fed: none Calif: S 1.3 CNPS List 2.3	Low (local rarity)
Dudleya abramsii ssp. *affinis* San Bernardino Mts. dudleya	Perennial herb, pebble plains & rock outcrops (often carbonate); pinyon woodland, open pine forests, about 5,200-8,500 ft. elev.; San Bernardino Mtns endemic	April - June	Fed: none Calif: S 2.2 CNPS: List 1B.2	Moderate (marginal habitat)
Eriogonum foliosum (*E. evanidum*) Leafy buckwheat	Annual; sandy soil, woodlands or shrublands; about 3,900-7,200 ft. elev.; scattered locations, Big Bear Valley to N Baja Calif.; may be extinct in Calif.	July - Oct.	Fed: none Calif: SH CNPS List 1B.2	Minimal (presumed extinct, local rarity)

Appendix 2: Special Status Species Potentially Occurring on the Project Site

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Eriogonum kennedyi var. *austromontanum* Southern mountain buckwheat	Matting woody perennial; pebble plains and similar soils, about 5,800 – 7,800 ft. elev.; nearly endemic to Big Bear area, also reported at Mt. Pinos	July - August	Fed: THR Calif: S2.2 CNPS: List 1B.2	Apparent introgression w/ Wright's buckwheat (see text)
Eriogonum microthecum var. *lacus-ursi* Bear Lake buckwheat	Subshrub; montane forests and shrublands; only known occurrence at Big Bear Lake shore ca. 7,200 ft. elev.	July - Sept	Fed: none Calif: S 1 CNPS List 1B.1	Minimal (field survey)
Eriophyllum lanatum var. *obovatum* Southern Sierra woolly sunflower	Perennial herb; open montane coniferous forests, 4,200-8,200 ft. elev.; S Sierra Nevada and western San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Galium jepsonii (*G. angustifolium* var. *subglabrum*) Jepson's bedstraw	Perennial herb; sandy or gravelly soils, montane conifer forest, 6,500-8,100 ft. elev.; San Gabriel and San Bernardino Mtns	July - August	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Galium johnstonii (*G. angustifolium* var. *pinetorum*) Johnston's bedstraw	Perennial herb, dry slopes, chaparral, lower montane forest, pinyon and juniper woodland; about 4,000-7,600 ft. elev.; San Bernardino, San Gabriel, maybe San Jacinto mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Low-moderate (suitable habitat occurs; margin of elev. range)
Gilia leptantha ssp. *leptantha* San Bernardino Mtn. gilia	Annual; sandy or gravelly soils, open pine forest; endemic to upper Santa Ana Riv. watershed, San Bernardino Mtns., about 5,000 to 7,700 ft. elev.	June - Aug	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (probably outside geogr. range)
Heuchera hirsutissima Shaggy-haired alum root *Heuchera parishii* Parish's alumroot	Perennial herbs; rocky outcrops, cliffs, slopes; montane forest or alpine boulderfields; above about 4,800 ft. elev.; *H. hirsutissima* is endemic to San Jacinto and Santa Rosa Mtns (unconfirmed from San Bernardino Mtns); *H. parishii* endemic to San Bernardino Mtns	May - July	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (poorly suitable habitat)
Hulsea vestita ssp. *parryi* Parry's sunflower	Perennial herb; gen. conifer forests, on loose eroding soil and talus; San Bernardino Mtns and Little San Bern. Mtns; about 5,500-9,500 ft. elev.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	Low-moderate (marginal habitat)

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Ivesia argyrocoma Silver-haired ivesia	Perennial herb; pebble plains, seasonal meadows, drainages; about 4,900-8,800 ft. elev.; San Bernardino Mtns and a long-disjunct site in Baja Calif mtns	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Occurs (field survey & NDDB record)
Juncus duranii Duran's rush	Perennial herb; meadows, seeps, etc., montane forest, about 5,800-9,000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	July - August	Fed: none USFS: none Calif: S 3.3 CNPS: List 4.3	Low (masrginal habitat occurs)
Lewisia brachycalyx Short-sepaled lewisia	Perennial herb; wet meadows, mesic forest openings, about 4,500-7,600 ft. elev.; San Bernardino Mtns to Baja Calif, Utah, New Mexico	May - June	Fed: none Calif: S3.2 CNPS: List 2.2	Low-Moderate (marginal habitat)
Lilium parryi Lemon lily	Bulb; meadows and streambanks, about 4,200 – 8,600 ft. elev.; mtns of S Calif. and SE Arizona	July - August	Fed: none Calif: S2.1 CNPS: List 1B.2	Low (marginal habitat)
Linanthus killipii Baldwin Lake linanthus	Annual; pebble plains, alkaline meadows, forest openings, about 5,500-7,900 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.1 CNPS: List 1B.2	High (suitable habitat occurs)
Mimulus exiguus San Bernardino Mountain monkeyflower	Annual; open, seasonally moist meadows, seeps, drainages, about 5,900 – 7,600 ft. elev.; San Bernardino Mtns. and high mtns of Baja Calif.	June - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Mimulus purpureus Purple monkeyflower	Annual; meadow edges, forests, drainages, seeps, about 6,200 – 7,600 ft. elev.; San Bernardino Mtns and high mtns of Baja Calif.	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Navarretia peninsularis Baja navarretia	Annual herb; open, seasonally wet places in coniferous forests, about 4,900 -7,600 ft. elev.; mtns of central and S Calif. and N Baja Calif.	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low (small patches of marginal habitat)
Oxytheca caryophylloides Chickweed oxytheca	Annual; sandy soils in conifer forests, 3,900-8,500 ft. elev.; S Sierra Nevada, Transverse Ranges, San Jacinto Mtns	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Perideridia parishii ssp. *parishii* Parish's yampah	Perennial herb; meadows, moist areas in conifer forest, about 4,800 – 9,900 ft. elev.; San Bernardino Mtns and (disjunct) AZ, Nevada, New Mexico	June - August	Fed: none Calif: S2.2? CNPS: List 2.2	Low - moderate (marginal habitat)

Appendix 2: Special Status Species Potentially Occurring on the Project Site

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Phacelia exilis (*P. mohavensis* var. *exilis*) Transverse Range phacelia	Annual; sandy or gravelly soils, forest openings, meadows, pebble plains, about 3,600 – 8,900 ft. elev.; S Sierra Nevada and Transverse Ranges	May - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Phacelia mohavensis Mojave phacelia	Annual; sandy or gravelly soil; dry meadows and streambeds gen. within pine forest, about 4,500-8,100 ft. elev.; San Gabriel & San Bernardino Mtns.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Phlox dolichantha Bear Valley phlox	Perennial herb; montane forest and pebble plains; about 6,000 – 9,800 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Poa atropurpurea San Bernardino bluegrass	Open, flat meadows, about 6,700 – 7,500 ft. elev. in the San Bernardinos; endemic to San Bernardino Mtns and San Diego Co. (Palomar and Laguna Mtns where it ranges down to about 4,400 ft. elev.)	May - June	Fed: END Calif: S2.2 CNPS: List 1B.2	Low (habitat marginal at best)
Potentilla glandulosa ssp. *ewanii* Ewan's cinquefoil	Perennial herb; mesic conifer forest, about 6,200-7,900 ft. elev.; nearly endemic to San Gabriel Mtns., but also reported from Fawnskin area, San Bernardino Mtns.	June - July	Fed: none Calif: S 1.3 CNPS List 1B.3	Low (field survey)
Pyrrocoma uniflora ssp. *gossypina* (*Haplopappus uniflorus* ssp. *gossypinus*) Bear Valley pyrrocoma	Perennial herb; meadows (usually alkaline), pebble plains, about 5,200 – 7,600 ft. elev.; San Bernardino Mts endemic	July - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low - moderate (marginally suitable habitat occurs)
Rupertia rigida (*Psoralea rigida*) Parish's rupertia	Perennial herb; chaparral, forests, and woodlands, about 2,300-8,200 ft. elev.; San Bernardino Mtns, Peninsular Ranges, Baja Calif.	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Selaginella asprella Bluish spike-moss	Herb; rocks, crevices, & rocky soils, dry sites in conifer forests, about 5,200-8,800 ft. elev.; scattered mtn. ranges of cent. & S Calif., Baja Calif.	July	Fed: none Calif: S3.3 CNPS: List 4.3	Low (marginal habitat)
Senecio bernardinus (*Packera bernardinoa*) San Bernardino butterweed	Perennial herb; dry meadows (incl. alkaline), about 5,900-7,600 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	Low (marginally suitable habitat)

Appendix 2: Special Status Species Potentially Occurring on the Project Site

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Senecio ionophyllus Tehachapi ragwort	Perennial herb; crevices, rocky places in dry conifer forest, about 4,800-8,900 ft. elev.; S Sierra Nevada, San Gabriel and San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Moderate (suitable habitat)
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	Perennial herb; chaparral, oak shrubland or woodland, pine forest; San Bernardino Mtns. and a few Santa Barbara Co. sites, about 3,200 – 6,000 ft. elev.	June - August	Fed: none CA: Rare S 1.2 CNPS: List 1B.2	Minimal (marginal habitat, above elev. range)
Sidalcea pedata Bird's foot checkerbloom	Perennial herb; meadows (freshwater or alkaline clay), sometimes streambanks, about 5,200-8,200 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: END Calif: END, 1.1 CNPS: List 1B.1	Low (habitat marginal at best)
Sphenopholis obtusata Prairie wedge grass	Perennial grass; riparian woodlands, meadows, streambanks; about 1,000 – 6,600 ft. elev.; few scattered locns in Calif. but widespread in N America	April - July	Fed: none Calif: S2.2 CNPS: List 2.2	Low (upper margin elev. range; poor habitat)
Streptanthus bernardinus Laguna Mountains jewelflower	Perennial herb; chaparral, hardwood & conifer forest, about 3,900-8,100 ft. elev.; mtns of S Calif. (gen. W half of San Bernardino Mtns)	June - July	Fed: none Calif: S 3.3 CNPS: List 4.3	Moderate (margin of geogr. range)
Streptanthus campestris Southern jewelflower	Perennial herb; shrublands, forests, woodlands, often rocky sites, about 2,900 -7,600 ft. elev.; Transverse and Peninsular Ranges, Baja Calif.	May - July	Fed: none Calif: S 2.3 CNPS: List 1B.3	High (suitable habitat occurs)
Swertia neglecta (*Frasera neglecta*) Pine green-gentian	Perennial herb; conifer forests and pinyon woodland., about 4,600-8,200 ft. elev.; S Coastal Ranges and Transverse Ranges	May - July	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Taraxacum californicum California dandelion	Perennial herb; wet meadows, about 5,300 – 9,200 ft. elev.; San Bernardino Mtns endemic	May - Aug	Fed: END Calif: S2.1 CNPS: List 1B.2	Low - moderate (suitable habitat occurs)
Thelypodium stenopetalum Slender-petaled thelypodium	Perennial herb; meadows (mesic, usually alkaline clay), about ,5200 – 8,200 ft. elev.; endemic to Big Bear and Holcomb Valleys	May - Aug	Fed: END Calif: END, 1.1 CNPS: List 1B.1	Minimal (no alkaline meadow habitat)
Trichostema micranthum Small-flowered bluecurls	Annual; dry margins of lakes, meadows, and streams, 5,000-7,600 ft. elev., San Bernardino Mtns and Baja Calif.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Viola pinetorum ssp. *grisea* Grey-leaved violet	Perennial herb; montane forests, about 4,900 -11,200 ft. elev.; S Sierra Nevada and reported San Bernardino Mtns (CNPS but no other source)	April - July	Fed: none Calif: S 1.3 CNPS: List 1B.3	Low (suitable habitat occurs; may be outside geogr. range)
General references: CDFG 2007a, 2007b; CNPS 2007; Hickman (ed.) 1993; Munz 1974; Sanders et al. 1995; Tibor 2001, US Fish and Wildlife Service 2006.				

Appendix 3: Species List

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
CUPRESSACEAE	**CYPRESS FAMILY**		
Calocedrus decurrens	Incense cedar	Occas. / forest	
Juniperus occidentalis	Western juniper	Comm. / forest	
PINACEAE	**PINE FAMILY**		
Abies concolor	White fir	Occas. / forest	
Pinus jeffreyi	Jeffrey pine	Comm. / forest	
Pinus monophylla	Pinyon pine	Occas. /forest	
APIACEAE	**CELERY FAMILY**		
Lomatium nevadense	Nevada lomatium	Uncomm. / forest	11669
Tauschia parishii	Parish tauschia	Scarce / open places	11668
ASTERACEAE	**ASTER FAMILY**		
Achillia millefolium	California yarrow	Comm. / esp. mesic sites	
Agoseris retrorsa	Spear-leaved agoseris	Occas. / throughout	
Antennaria dimorpha	Low everlasting	Comm. / pebble plains	
Artemisia dracunculus	Tarragon	Occas. / esp. near road, lakeshore	
Artemisia ludoviciana	Western mugwort	Occas. / open places, washes	
Artemisia tridentata	Great Basin sagebrush	Comm. / open forest	
Aster frondosus	Short-rayed alkali aster	Occas.-comm. / near shore	
Chrysothamnus nauseosus	Common rabbitbrush	Occas. / throughout	
Chrysothamnus viscidiflorus	Curlleaf rabbitbrush	Occas.-comm. / throughout	
Cirsium occidentale var. californicum	California thistle	Uncomm. / open sites	
* *Cirsium vulgare*	Bull thistle	Occas. / near shore	
Erigeron breweri	Brewer's daisy	Occas. / forest	
Erigeron divergens	Diffuse daisy	Comm. / gen. open places	11667
Eriophyllum confertiflorum	Golden yarrow	Comm. / ± throughout	
Gnaphalium canescens	Perennial cudweed	Uncomm. / gen. open places	
* *Gnaphalium luteo-album*	Pearly everlasting	Occas. / roadside, shoreline	
Hymenopappus filifolius	Columbia cutleaf	Uncomm. / open forest	
* *Lactuca serriola*	Prickly lettuce	Occas. / mostly roadside	
Lessingia filaginifolia (Corethrogyne filaginifolia)	Chaparral aster	Occas. / open forest	
Madia elegans	Elegant tarplant	Occas. / forest	
* *Senecio vulgaris*	Common groundsel	Uncomm. / gen. roadside	
Solidago californica	California goldenrod	Occas. / mesic sites	
* *Sonchus oleraceus*	Common sow thistle	Occas. / near shore	

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
* *Taraxacum officinale*	Common dandelion	Occas. / roadside, shoreline	
Tetradymia comosa	Hairy horsebrush	Occas. / open forest	
* *Tragopogon dubius*	Oyster plant, salsify	Occas. / roadside, forest	
BORAGINACEAE	**BORAGE FAMILY**		
Cryptantha micrantha	Purple root cryptantha	Occas. / open places	
Cryptantha simulans	Popcorn flower	Scarce / open places	11670
BRASSICACEAE	**MUSTARD FAMILY**		
Arabis holboellii (?)	Holboell's rock-cress	Occas. / open forest	
** *Arabis parishii*	Parish's rock-cress	Occas. / pebble plains	11665
Caulanthus major	Slender wild-cabbage	Occas. / forest	
Descurainia incisa (D. richardsonii)	Mountain tansy mustard	Uncomm. / near road	
Descurainia pinnata	Tansy mustard	Occas. / mostly open forest	
Erysiumum capitatum	Douglas wallflower	Occas. / ±throughout	
* *Lepidium virginicum v. pubescens*	Wild peppergrass	Occas. / mostly roadside, shoreline	
* *Sisymbrium altissimum*	Tumble mustard	Occas. / roadside	
CACTACEAE	**CACTUS FAMILY**		
Opuntia basilaris var. basilaris	Common beavertail cactus	Uncomm. / open forest	
CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**		
Symphoricarpos rotundifolius var. parishii	Parish snowberry	Occas. / shaded forest	
CARYOPHYLLACEAE	**CARNATION FAMILY**		
Silene verecunda ssp. platyota	Cuyamaca campion	Occas. / forest	
CHENOPODIACEAE	**GOOSEFOOT FAMILY**		
* *Chenopodium album (?)*	Common goosefoot	Occas. / throughout	
* *Salsola tragus*	Russian thistle, tumbleweed	Occas. / mostly roadside	
CONVOLVULACEAE	**MORNING GLORY FAMILY**		
Calystegia malacophylla ssp. fulcrata (C. fulcrata)	Morning glory	Occas. / throughout	
ERICACEAE	**MANZANITA FAMILY**		
Arctostaphylos patula	Greenleaf manzanita	Occas.-comm. / forest	
EUPHORBIACEAE	**SPURGE FAMILY**		
Chamaesyce albomarginata	Rattlesnake spurge	Occas. / open forest	
Euphorbia palmeri	Wood spurge	Occas. / uplands	
FABACEAE	**PEA FAMILY**		
Amorpha californica	California false indigo	Occas. / mesic forest	
** *Astragalus leucolobus*	Bear Valley woollypod	Comm. / pebble plains	11705
Astragalus douglasii	Douglas rattleweed	Uncomm. / open places	

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
Lotus argyraeus	Silver lotus	Occas. / open forest	
Lotus nevadensis	Nevada lotus	Comm. / open places	
Lupinus cf. breweri	Silver mat lupine	Comm. / pebble plains, etc.	
Lupinus excubitus var. austromontanus	Southern mountain lupine	Occas. / ± throughout	11666
Lupinus lepidus v. confertus	Prairie lupine	Occas. / lakeshore	
* *Medicago lupulina*	Black medick	Uncomm. / near lakeshore	
* *Melilotus alba*	White sweet-clover	Occas.-comm. / roadsides, shore	
FAGACEAE	**OAK FAMILY**		
Quercus kelloggii	California black oak	Comm. / forest	
GERANIACEAE	**GERANIUM FAMILY**		
* *Erodium cicutarium*	Red-stemmed filaree	Occas.-comm. / roadsides, etc.	
HYDROPHYLLACEAE	**WATERLEAF FAMILY**		
Eridictyon trichocalyx	Yerba santa	Occas. / open forest	
Phacelia distans (?)	Common phacelia	Uncomm. / open forest	
Phacelia imbricata	Broad-sepaled phacelia	Uncomm. / open forest	
LAMIACEAE	**MINT FAMILY**		
Monardella linoides (?) (or M. odoratissima)	Flax-leaved monardella	Occas. / forest	
Scutellaria siphocampyloides (S. austinae)	Austin's skullcap	Uncomm. / mesic forest	
LOASACEAE	**STICK-LEAF FAMILY**		
Mentzelia sp.	Unid. stick-leaf	Uncomm. / uplands	11674
MALVACEAE	**MALLOW FAMILY**		
* *Malva parviflora*	Cheeseweed	Occas. / mostly lakeshore	
ONAGRACEAE	**EVENING PRIMROSE FAMILY**		
Clarkia sp.	Unid. annual clarkia	Uncomm. / shaded forest	
Epilobium brachycarpum (E. paniculatum)	Summer cottonweed	Occas.-comm. upland margins	
Epilobium ciliatum	Willow-herb	Occas. / mostly lakeshore	
Gaypohytum sp.	Unid. gayophytum	Comm. / open forest	
POLEMONIACEAE	**PHLOX FAMILY**		
Gilia latiflora (?)	Broad-flowered gilia	Uncomm. / open forest	
Gilia modocensis	Modoc gilia	Occas. /open places	11659
Eriastrum densifolium ssp. densifolium	Mojave woolly-star	Occas. / open forest	
Eriastrum sapphirinum	Sapphire woollystar	Occas. / open forest	
Linanthus breviculus	Mojave linanthus	Comm. / open forest	
Phlox gracilis	Slender phlox	Comm. / open places	11660

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
POLYGONACEAE	**BUCKWHEAT FAMILY**		
Eriogonum davidsonii (=E. molestum var. davidsonii)	Davidson buckwheat	Occas. / open forest	
Eriogonum wrightii ssp. subscaposum	Wright's buckwheat	Comm. & characteristic / pebble plains	
Eriogonum umbellatum v. munzii	Munz sulfur buckwheat	Occas. / open forest	
* *Polygonum arenastrum*	Common knotweed	Occas. / roadside, lake shore	
* *Rumex crispus*	Curly dock	Occas. / mostly lakeshore	
Rumex salicifolius	Willow dock	Uncomm. / near lakeshore	
PORTULACACEAE	**PURSLANE FAMILY**		
Lewisia rediviva	Bitter root	Occas.-comm. / pebble plains	
RANUNCULACEAE	**BUTTERCUP FAMILY**		
Delphinium parishii (?)	Parish larkspur	Occas. / forest	
* *Ranunculus sceleratus*	Cursed buttercup	Occas. / lakeshore	11656
RHAMNACEAE	**BUCKTHORN FAMILY**		
Ceanothus cordulatus	Mountain whitethorn	Occas. / open forest	
Ceanothus greggii	Cupleaf ceanothus	Uncomm. / open forest	
Ceanothus integerrimus	Deerbrush	Occas. / forest	
ROSACEAE	**ROSE FAMILY**		
Amelanchier utahensis	Service berry	Comm. / ± throughout	
Cercocarpus betuloides	Birch-leaf mountain mahogany	Uncomm.	
Cercocarpus ledifolius	Curlleaf mountain mahogany	Comm. / ± throughout	
Horkelia rydbergii (H. bolanderi s. parryi)	Transverse range horkelia	Occas. / mostly near lake	
** *Ivesia argyrocoma*	Silver-haired ivesia	locally comm. / pebble pl.	11658
Potentilla anserina	Silverweed	Comm. / lakeshore	
Potentilla biennis	Biennial cinquefoil	Comm. / lakeshore	11671
Potentilla gracilis	Slender cinquefoil	Occas. / mesic places	
Potentilla wheeleri	Wheeler cinquefoil	Scarce / near lakeshore	11673
RUBIACEAE	**COFFEE FAMILY**		
* *Galium aparine*	Goose grass	Uncomm. / shaded forest	
Galium parishii	Parish bedstraw	Occas. / forest	
SALICACEAE	**WILLOW FAMILY**		
Populus balsamifera trichocarpa	Black cottonwood	Seedlings only / lakeshore	
Salix laevigata (?)	Red willow	Uncomm. / lakeshore	
Salix lasiolepis (?)	Arroyo willow	Comm. / lakeshore	

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
SCROPHULARIACEAE	**SNAPDRAGON FAMILY**		
** *Castilleja cinera*	Ash-gray paintbrush	Localized / pebble plains	11657
** *Castilleja montigena (C. applegatei ssp. martinii)*	Heckerd's paintbrush	Occas. / forest	
Collinsis parviflora	Small-flowered blue-eyed Mary	Comm., patchy / peb. pl.	11661
Limosella acaulis	Mudwort	Comm.-abund. / wet lakeshore	11655
Mimulus guttatus	Seep monkeyflower	Occas. / lakeshore	
Pedicularis semibarbata	Pine-woods lousewort	Occas. / forest	11664
Penstemon eatonii	Eaton firecracker	Occas. / forest	
* *Verbascum thapsus*	Common muellin	Occas. / throughout	
SOLANACEAE	**NIGHTSHADE FAMILY**		
Solanum xanti	Chaparral nightshade	Uncomm. / forest	
STERCULIACEAE	**CACAO FAMILY**		
Fremontodendron californicum	Flannel bush	Occas.-comm. / open forest	
TAMARICACEAE	**TAMARISK FAMILY**		
Tamarix ramosissima	Mediterranean tamarisk	Occas. / lakeshore	
URTICACEAE	**NETTLE FAMILY**		
Urtica dioica ssp. holosericea	Stinging nettle	Occas. / lakeshore	
VIOLACEAE	**VIOLET FAMILY**		
Viola douglasii	Douglas violet	Occas. / pebble plains	11663
Viola purpurea	Mountain violet	Occas. / throughout	11662
VISCACEAE	**MISTLETOE FAMILY**		
Arceuthobium campylopodum	Dwarf mistletoe	Uncomm. / on yellow pines	
CYPERACEAE	**SEDGE FAMILY**		
Carex athrostachya	Slender-beaked sedge	Occas. / near lake	
Carex sp.	Unid. sedge	Uncomm. / near lakeshore	11671
JUNCACEAE	**RUSH FAMILY**		
Juncus arcticus (incl. vars. balticus and mexicanus)	Wire-grass	Occas.-comm. / mesic areas	
LILIACEAE	**LILY FAMILY**		
Allium parryi	Parry's onion	Occas. / mostly pebble plains	
Calochortus kennedyi	Kennedy's mariposa lily	Uncomm. / open forest	
POACEAE	**GRASS FAMILY**		
Agrostis sp.	Unid. bentgrass	Occas. / lakeshore	
Alopecurus aequalis	Short-awn foxtail	Comm., patchy / near shore	
Bromus carinatus	California brome	Occas. / uplands, ±throughout	

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Plants			
Latin Name	**Common Name**	**Frequency/Location**	**Voucher #**
Bromus orcuttianus (?)	Orcutt brome	Uncomm. / mesic forest	
* *Bromus tectorum*	Cheat grass	Comm. / ± throughout	
Elymus elymoides (Sitanion hystrix v. hystrix)	Bottlebrush squirreltail	Occas. / ± throughout	
Elymus glaucus	Blue wild-rye	Occas. / ± throughout	
Hordeum jubatum	Foxtail barley	Uncomm. / mostly near lake	
* *Koeleria macrantha*	Junegrass	Occas. / mesic forest, uplands	
Melica stricta	Nodding melic	Uncomm. patchy, uplands	
Muhlenbergia rigens	Deergrass	Occas. / throughout	
Poa fendleriana	Fendler bluegrass	Occas.-comm. / forest	
Poa secunda	Nodding bluegrass	Comm. / ± throughout	
* *Polypogon monspeliensis*	Rabbitfoot grass	Occas.-comm. / near shore	
Pucinellia nuttalliana	Alkali grass	Uncomm. / low-lying mesic site	
Stipa coronata ssp. depauperata (Achnatherum parishii)	Parish needlegrass	Occas. / mostly open forest	
Stipa lettermannii	Letterman's needlegrass	Occas. / forest	
Vulpia microstachys (Festuca microstachys, F. reflexa, F. pacifica, F. confusa)	Annual fescue	Uncomm. patchy / upland	

Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season.

Plants were identified using keys, descriptions, and illustrations in Abrams (1923-1951), Hickman (1993), Munz (1974), and other regional references. Taxonomy and nomenclature generally follow Hickman.

Some plants were collected as vouchers (see collection numbers at right) and will be donated to the Herbaria at Rancho Santa Ana Botanic Garden or UC Riverside.

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
AMPHIBIA	**AMPHIBIANS**
SALAMANDRIDAE	**NEWTS**
Taricha torosa	California newt
PLETHODONTIDAE	**LUNGLESS SALAMANDERS**
Ensatina eschscholtzii	Ensatina
Aneides lugubris	Arboreal salamander
Batrachoseps pacificus	Pacific slender salamander
PELOBATIDAE	**SPADEFOOT TOADS**
** *Scaphiopus hammondii*	Western spadefoot
BUFONIDAE	**TRUE TOADS**
Bufo boreas	Western toad
Bufo woodhousei	Woodhouse toad
** *Bufo microscaphus*	Southwestern toad
Bufo punctatus	Red-spotted toad
HYLIDAE	**TREEFROGS**
Hyla cadaverina	California treefrog
Hyla regilla	Pacific treefrog
RANIDAE	**TRUE FROGS**
** *Rana aurora*	Red-legged frog
** *Rana pipiens*	Northern leopard frog
* *Rana catesbeiana*	Bullfrog
REPTILIA	**REPTILES**
EMYDIDAE	**BOX AND WATER TURTLES**
** *Clemmys marmorata*	Western pond turtle
TESTUDINIDAE	**LAND TORTOISES**
** *Gopherus agassizii (Xerobates agassizi)*	Desert tortoise
TRIONYCHIDAE	**SOFTSHELL TURTLES**
Trionyx spiniferus	Spiny softshell
GEKKONIDAE	**GECKOS**
Coleonyx variegatus	Western banded gecko
** *Coleonyx swaitaki*	Barefoot gecko
Phyllodactylus xanti	Leaf-toed gecko
IGUANIDAE	**IGUANID LIZARDS**
Dipsosaurus dorsalis	Desert iguana
Sauromalus obesus	Common chuckwalla
Callisaurus draconoides	Zebra-tailed lizard
** *Uma notata ssp. notata*	Colorado desert fringe-toed lizard
** *Uma inornata*	Coachella valley fringe-toed lizard
** *Uma scoparia*	Mojave fringe-toed lizard
Crotaphytus insularis	Desert collared lizard
Gambelia wislizenii	Long-nosed leopard lizard

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Sceloporus magister	Desert spiny lizard
Sceloporus orcutti	Granite spiny lizard
Sceloporus occidentalis	Western fence lizard
Sceloporus grasiosus	Sagebrush lizard
Uta stansburiana	Side-blotched lizard
Urosaurus graciosus	Long-tailed brush lizard
Petrosaurus mearnsi	Banded rock lizard
** *Phrynosoma coronatum ssp. blainvillei*	San Diego horned lizard
Phrynosoma platyrhinos	Desert horned lizard
** *Phrynosoma mcallii*	Flat-tailed horned lizard
XANTUSIIDAE	**NIGHT LIZARDS**
Xantusia henshawi	Granite night lizard
Xantusia vigilis	Desert night lizard
SCINCIDAE	**SKINKS**
Eumeces skiltonianus	Western skink
Eumeces gilberti	Gilbert skink
TEIIDAE	**WHIPTAILS**
** *Cnemidophorus hyperythrus*	Orange-throated whiptail
** *Cnemidophorus tigris*	Western whiptail
ANGUIDAE	**ALLIGATOR LIZARDS**
Gerrhonotus multicarinatus	Southern alligator lizard
ANNIELLIDAE	**LEGLESS LIZARDS**
** *Aniella pulchra ssp. pulchra*	Silvery legless lizard
LEPTOTYPHLOPIDAE	**SLENDER BLIND SNAKES**
Leptotyphlops humilis	Western blind snake
BOIDAE	**BOAS AND PYTHONS**
** *Charina bottae ssp. umbratica*	Southern rubber boa
Lichanura trivirgata	Rosy boa
COLUBRIDAE	**COLUBRIDS**
** *Diadophis punctatus*	Ringneck snake
Phyllorhynchus decurtatus	Spotted leaf-nosed snake
Coluber constrictor	Racer
Masticophis flagellum	Coachwhip
Masticophis lateralis	California whipsnake
** *Salvadora hexalepis*	Western patch-nosed snake
Arizona elegans	Glossy snake
Pituophis melanoleucus	Gopher snake
Lampropeltis getulus	Common kingsnake
** *Lampropeltis zonata ssp. pulchra*	San Bernardino Mountain kingsnake
Rhinocheilus lecontei	Long-nosed snake
Thamnophis sirtalis	Common garter snake
Thamnophis elegans	Western terrestrial garter snake

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
** *Thamnophis hammondii*	Two-striped garter snake
VIPERIDAE	**VIPERS**
Crotalus atrox	Western diamondback rattlesnake
** *Crotalus ruber*	Red diamond rattlesnake
Crotalus mitchellii	Speckled rattlesnake
Crotalus cerastes	Sidewinder
Crotalus viridis	Western rattlesnake
Crotalus scutulatus	Mojave rattlesnake
AVES	**BIRDS**
GAVIIDAE	**LOONS**
Gavia immer	Common loon
PODICIPEDIDAE	**GREBES**
Podilymbus podiceps	Pied-billed grebe
Podiceps nigricollis	Eared grebe
Aechmophorus occidentalis	Western grebe
Aechmophorus clarkii	Clark's grebe
PELECANIDAE	**PELICANS**
Pelecanus erythrorhynchos	American white pelican
** *Pelecanus occidentalis*	Brown pelican
PHALACROCORACIDAE	**CORMORANTS**
Phalacrocorax auritus	Double-crested cormorant
ARDEIDAE	**HERONS**
Botaurus lentiginosus	American bittern
Ardea herodias	Great blue heron
Casmerodius albus	Great egret
Egretta thula	Snowy egret
Bubulcus ibis	Cattle egret
Butorides striatus	Green-backed heron
** *Nycticorax nycticorax*	Black-crowned night heron
THRESKIORNITHIDAE	**IBISES AND SPOONBILLS**
** *Plegadis chihi*	White-faced ibis
ANATIDAE	**DUCKS, GEESE AND SWANS**
Anser albifrons	Greater white-fronted goose
Chen caerulescens	Snow goose
Chen rossii	Ross' goose
Branta canadensis	Canada goose
Anas crecca	Green-winged teal
Anas platyrhynchos	Mallard
Anas acuta	Northern pintail
Anas discors	Blue-winged teal
Anas cyanoptera	Cinnamon teal
Anas clypeata	Northern shoveler

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Anas strepera	Gadwall
Anas americana	American wigeon
Aythya valisineria	Canvasback
Aythya americana	Redhead
Aythya collaris	Ring-necked duck
Aythya affinis	Lesser scaup
Bucephala clangula	Common goldeneye
Bucephala albeola	Bufflehead
Mergus merganser	Common merganser
Mergus serrator	Red-breasted merganser
Oxyura jamaicensis	Ruddy duck
RALLIDAE	**RAILS, GALLINULES, COOTS**
Rallus longirostris	Clapper rail
Rallus limicola	Virginia rail
Porzana carolina	Sora
Gallinula chloropus	Common moorhen
Fulica americana	American coot
CATHARTIDAE	**VULTURES**
Cathartes aura	Turkey vulture
ACCIPITRIDAE	**HAWKS, EAGLES, HARRIERS**
** *Pandion haliaetus*	Osprey
** *Elanus caeruleus*	Black-shouldered kite
** *Aquila chrysaetos*	Golden eagle
** *Haliaeetus leucocephalus*	Bald eagle
** *Circus cyaneus*	Northern harrier
** *Accipiter striatus*	Sharp-shinned hawk
** *Accipiter cooperii*	Cooper's hawk
Buteo lineatus	Red-shouldered hawk
** *Buteo swainsoni*	Swainson's hawk
Buteo jamaicensis	Red-tailed hawk
** *Buteo regalis*	Ferruginous hawk
Buteo lagopus	Rough-legged hawk
FALCONIDAE	**FALCONS**
Falco sparverius	American kestrel
** *Falco columbarius*	Merlin
** *Falco peregrinus*	Peregrine falcon
** *Falco mexicanus*	Prairie falcon
PHASIANIDAE	**GROUSE AND QUAIL**
Alectoris chukar	Chukar
Phasianus colchicus	Ring-necked pheasant
Callipepla gambelii	Gambel's quail
Callipepla californica	California quail

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Oreortyx pictus	Mountain quail
CHARADRIIDAE	**PLOVERS**
Pluvialis squatarola	Black-bellied plover
** *Charadrius alexandrinus*	Snowy plover
Charadrius semipalmatus	Semipalmated plover
Charadrius vociferus	Killdeer
** *Charadrius montanus*	Mountain plover
RECURVIROSTRIDAE	**STILTS AND AVOCETS**
Himantopus mexicanus	Black-necked stilt
Recurvirostra americana	American avocet
SCOLOPACIDAE	**SANDPIPERS**
Tringa melanoleuca	Greater yellowlegs
Tringa flavipes	Lesser yellowlegs
Catoptrophorus semipalmatus	Willet
Actitis macularia	Spotted sandpiper
Numenius phaeopus	Whimbrel
Numenius americanus	Long-billed curlew
Limosa fedoa	Marbled godwit
Arenaria interpres	Ruddy turnstone
Arenaria melanocephala	Black turnstone
Calidris canutus	Red knot
Calidris alba	Sanderling
Calidris pusilla	Semipalmated sandpiper
Calidris mauri	Western sandpiper
Calidris minutilla	Least sandpiper
Calidris alpina	Dunlin
Limnodromus griseus	Short-billed dowitcher
Limnodromus scolopaceus	Long-billed dowitcher
Gallinago gallinago	Common snipe
Phalaropus tricolor	Wilson's phalarope
Phalaropus lobatus	Red-necked phalarope
LARIDAE	**GULLS AND TERNS**
Larus philadelphia	Bonaparte's gull
Larus delawarensis	Ring-billed gull
Larus californicus	California gull
Larus argentatus	Herring gull
Larus occidentalis	Western gull
Sterna caspia	Caspian tern
Sterna hirundo	Common tern
Sterna forsteri	Forster's tern
COLUMBIDAE	**PIGEONS AND DOVES**
Columba livia	Rock dove

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Columba fasciata	Band-tailed pigeon
* *Streptopelia chinensis*	Spotted dove
Zenaida asiatica	White-winged dove
Zenaida macroura	Mourning dove
Columbina passerina	Common ground-dove
CUCULIDAE	**CUCKOOS**
Geococcyx californianus	Greater roadrunner
TYTONIDAE	**BARN OWLS**
Tyto alba	Common barn-owl
STRIGIDAE	**TYPICAL OWLS**
Otus kennicottii	Western screech-owl
Bubo virginianus	Great horned owl
** *Speotyto cunicularia*	Burrowing owl
** *Asio otus*	Long-eared owl
CAMPRIMULGIDAE	**NIGHTJARS**
Chordeiles acutipennis	Lesser nighthawk
Chordeiles minor	Common nighthawk
Phalaenoptilus nuttallii	Common poorwill
APODIDAE	**SWIFTS**
Chaetura vauxi	Vaux's swift
Aeronautes saxatalis	White-throated swift
TROCHILIDAE	**HUMMINGBIRDS**
Archilochus alexandri	Black-chinned hummingbird
Calypte anna	Anna's hummingbird
Calypte costae	Costa's hummingbird
Selasphorus rufus	Rufous hummingbird
Selasphorus sasin	Allen's hummingbird
ALCEDINIDAE	**KINGFISHERS**
Ceryle alcyon	Belted kingfisher
PICIDAE	**WOODPECKERS**
Melanerpes formicivorus	Acorn woodpecker
Melanerpes lewis	Lewis' woodpecker
Sphyrapicus nuchalis	Red-naped sapsucker
Sphyrapicus thyroideus	Williamson's sapsucker
Picoides scalaris	Ladder-backed woodpecker
Picoides nuttallii	Nuttall's woodpecker
Picoides pubescens	Downy woodpecker
Picoides villosus	Hairy woodpecker
Picoides albolarvatus	White-headed woodpecker
Colaptes auratus	Northern flicker
TYRANNIDAE	**TYRANT FLYCATCHERS**
Contopus borealis	Olive-sided flycatcher

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Contopus sordidulus	Western wood-pewee
Empidonax trailii	Willow flycatcher
Empidonax hammondii	Hammond's flycatcher
Empidonax oberholseri	Dusky flycatcher
Empidonax wrightii	Gray flycatcher
Empidonax difficilis	Western flycatcher
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Myiarchus cinerascens	Ash-throated flycatcher
Tyrannus vociferans	Cassin's kingbird
Tyrannus verticalis	Western kingbird
ALAUDIDAE	**LARKS**
Eremophila alpestris	Horned lark
HIRUNDINIDAE	**SWALLOWS**
Tachycineta bicolor	Tree swallow
Tachycineta thalassina	Violet-green swallow
Stelgidopteryx serripennis	Northern rough-winged swallow
Hirundo pyrrhonota	Cliff swallow
Hirundo rustica	Barn swallow
CORVIDAE	**CROWS AND JAYS**
Cyanocitta stellari	Stellar's jay
Aphelocoma coerulescens	Scrub jay
Gymnorhinus cyanocephalus	Pinyon jay
Nucifraga columbiana	Clark's nutcracker
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
PARIDAE	**CHICKADEES AND TITMICE**
Parus gambeli	Mountain chickadee
Parus inornatus	Plain titmouse
REMIZIDAE	**VERDINS**
Auriparus flavipes	Verdin
AEGITHALIDAE	**BUSHTITS**
Psaltriparus minimus	Bushtit
SITTIDAE	**NUTHATCHES**
Sitta canadensis	Red-breasted nuthatch
Sitta carolinensis	White-breasted nuthatch
Sitta pygmaea	Pygmy nuthatch
CERTHIIDAE	**CREEPERS**
Certhia americana	Brown creeper
TROGLODYTIDAE	**WRENS**
Campylorhynchus brunneicapillus	Cactus wren
** *Campylorhynchus brunneicapillus*	Coastal cactus wren

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Salpinctes obsoletus	Rock wren
Catherpes mexicanus	Canyon wren
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	House wren
Cistothorus palustris	Marsh wren
CINCLIDAE	**DIPPERS**
Cinclus maxicanus	American dipper
MUSCICAPIDAE	**THRUSHES AND ALLIES**
Ixoreus naevius	Varied thrush
Regulus calendula	Ruby-crowned kinglet
Polioptila caerula	Blue-gray gnatcatcher
** *Polioptila melanura*	Black-tailed gnatcatcher
** *Polioptila californica*	California gnatcatcher
Sialia mexicana	Western bluebird
Sialia currucoides	Mountain bluebird
Myadestes townsendi	Townsend's solitaire
Catharus ustulatus	Swainson's thrush
Catharus guttatus	Hermit thrush
Turdus migratorius	American robin
Chamaea fasciata	Wrentit
MIMIDAE	**MOCKINGBIRDS AND THRASHERS**
Mimus polyglottos	Northern mockingbird
Oreoscoptes montanus	Sage thrasher
Toxostoma redivivum	California thrasher
** *Toxostoma crissale*	Crissal thrasher
** *Tosxostoma lecontei*	Le Conte's thrasher
MOTACILLIDAE	**WAGTAILS AND PIPITS**
Anthus spinoletta	American pipit
BOMBYCILLIDAE	**WAXWINGS**
Bombycilla cedrorum	Cedar waxwing
PTILOGONATIDAE	**SILKY FLYCATCHERS**
Phainopepla nitens	Phainopepla
LANIIDAE	**SHRIKES**
Lanius ludovicianus	Loggerhead shrike
STURNIDAE	**STARLINGS**
* *Sturnus vulgaris*	European starling
VIREONIDAE	**VIREOS**
** *Vireo bellii*	Bell's vireo
** *Vireo vicinior*	Gray vireo
Vireo solitarius	Solitary vireo
Vireo huttoni	Hutton's vireo
Vireo gilvus	Warbling vireo

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
EMBERIZIDAE	**SPARROWS, WARBLERS, TANAGERS**
Vermivora celata	Orange-crowned warbler
Vermivora ruficapilla	Nashville warbler
Vermivora luciae	Lucy's warbler
** *Dendroica petechia*	Yellow warbler
Dendroica coronata	Yellow-rumped warbler
Dendroica nigrescens	Black-throated gray warbler
Dendroica occidentalis	Hermit warbler
Dendroica townsendi	Townsend's warbler
Oporornis tolmiei	MacGillivray's warbler
Geothlypis trichas	Common yellowthroat
Wilsonia pusilla	Wilson's warbler
** *Icteria virens*	Yellow-breasted chat
** *Piranga rubra*	Summer tanager
Piranga ludoviciana	Western tanager
Pheucticus melanocephalus	Black-headed grosbeak
Guiraca caerulea	Blue grosbeak
Passerina amoena	Lazuli bunting
Pipilo chlorurus	Green-tailed towhee
Pipilo erythrophthalmus	Rufous-sided towhee
Pipilo crissalis	California towhee
Pipilo aberti	Abert's towhee
Aimophila ruficeps	Rufous-crowned sparrow
Spizella passerina	Chipping sparrow
Spizella breweri	Brewer's sparrow
Spizella atrogularis	Black-chinned sparrow
Pooecetes gramineus	Vesper sparrow
Chondestes grammacus	Lark sparrow
Amphispiza bilineata	Black-throated sparrow
Amphispiza belli	Sage sparrow
Passerculus sandwichensis	Savannah sparrow
Passerella iliaca	Fox sparrow
Melospiza melodia	Song sparrow
Melospiza lincolnii	Lincoln's sparrow
Zonotrichia atricapilla	Golden-crowned sparrow
Zonotrichia leucophrys	White-crowned sparrow
Junco hyemalis	Dark-eyed junco
Agelaius phoeniceus	Red-winged blackbird
** *Agelaius tricolor*	Tricolored blackbird
Sturnella neglecta	Western meadowlark
Xanthocephalus xanthocephalus	Yellow-headed blackbird

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Euphagus cyanocephalus	Brewer's blackbird
Quiscalus mexicanus	Great-tailed grackle
Molothrus ater	Brown-headed cowbird
Icterus cucullatus	Hooded oriole
Icterus galbula	Northern oriole
Icterus parisorum	Scott's oriole
FRINGILLIDAE	**FINCHES**
Carpodacus purpureus	Purple finch
Carpodacus cassinii	Cassin's finch
Carpodacus mexicanus	House finch
Carduelis pinus	Pine siskin
Carduelis psaltria	Lesser goldfinch
Carduelis lawrencei	Lawrence's goldfinch
Carduelis tristis	American goldfinch
PASSERIDAE	**WEAVERS**
* *Passer domesticus*	House sparrow
MAMMALIA	**MAMMALS**
DIDELPHIDAE	**OPOSSUMS**
Didelphis marsupialis	Common opossum
VESPERTILIONIDAE	**EVENING BATS**
Pipistrellus hesperus	Western pipistrelle
LEPORIDAE	**HARES AND RABBITS**
Lepus californicus	Black-tailed hare
Sylvilagus audubonii	Audubon cottontail
Sylvilagus bachmani	Brush rabbit
Sylvilagus sp.	Cottontail
SCIURIDAE	**SQUIRRELS**
** *Citellus mohavensis*	Mohave ground squirrel
** *Citellus tereticaudis ssp. chlorus*	Coachella Valley ground squirrel
** *Glaucomys sabrinus*	Northern flying squirrel
Otospermophilus beecheyi	Beechey ground squirrel
Ammospermophilus leucurus	Antelope ground squirrel
** *Ammospermophilus nelsoni*	San Joaquin antelope ground squirrel
Eutamias merriami	Merriam chipmunk
Sciurus griseus	Western gray squirrel
GEOMYIDAE	**POCKET GOPHERS**
Thomomys bottae	Botta pocket gopher
HETEROMYIDAE	**POCKET MICE**
Perognathus sp.	Pocket mouse
Perognathus longimembris	Little pocket mouse
** *Perognathus longimembris ssp. brevinasus*	Los Angeles pocket mouse
Perognathus formosus	Long-tailed pocket mouse

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
Perognathus baileyi	Bailey pocket mouse
Perognathus fallax	San Diego pocket mouse
Perognathus californicus	California pocket mouse
Perognathus spinatus	Spiny pocket mouse
Dipodomys sp.	Kangaroo rat
Dipodomys heermanni	Heermann kangaroo rat
Dipodomys panamintinus	Panamint kangaroo rat
** *Dipodomys stephensi*	Stephens' kangaroo rat
Dipodomys ingens	Giant kangaroo rat
Dipodomys merriami	Merriam kangaroo rat
** *Dipodomys merriami ssp parvus*	Cismontsne Merriam kangaroo rat
Dipodomys nitratoides	San Joaquin kangaroo rat
Dipodomys agilis	Pacific kangaroo rat
Dipodomys deserti	Desert kangaroo rat
CASTORIDAE	**BEAVERS**
Castor canadensis	Beaver
CRICETIDAE	**RATS AND MICE**
Reithrodontomys megalotis	Western harvest mouse
Peromyscus crinitus	Canyon mouse
Peromyscus californicus	California mouse
Peromyscus eremicus	Cactus mouse
Peromyscus maniculatus	Deer mouse
Onychomys torridus	Southern grasshopper mouse
Neotoma sp.	Wood rat
Neotoma albigula	White-throated wood rat
Neotoma lepida	Desert wood rat
Neotoma fuscipes	Dusky-footed wood rat
Microtus pennsylvanicus	Meadow mouse
Microtus californicus	California meadow mouse
MURIDAE	**OLD WORLD RATS AND MICE**
* *Mus musculus*	House mouse
CANIDAE	**FOXES, WOLVES AND COYOTES**
Canis latrans	Coyote
Vulpes macrotis	Kit fox
Urocyon cinereoargenteus	Gray fox
URSIDAE	**BEARS**
* *Ursus americanus*	Black bear
PROCYONIDAE	**RACCOONS**
Bassariscus astutus	Ringtail
Procyon lotor	Raccoon
MUSTELIDAE	**WEASELS AND SKUNKS**
Mustela frenata	Long-tailed weasel

Appendix 3: Species Observed

The following species were observed onsite during the 2007 survey period.

Vertebrate Animals	
Latin Name	**Common Name**
** *Taxidea taxus*	American badger
Spilogale putorius	Spotted skunk
Mephitis mephitis	Striped skunk
FELIDAE	**CATS**
Felis concolor	Mountain lion
Lynx rufus	Bobcat
EQUIDAE	**HORSES, BURROS AND ZEBRAS**
* *Equus astinus*	Feral donkey
CERVIDAE	**ELKS, MOOSE, CARIBOU, DEER**
Odocoileus hemionus	Mule deer
BOVIDAE	**SHEEP AND GOATS**
Ovis canadensis	Bighorn
Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season.	

A.8 - Revised Vegetation and Special Status Plants Survey (Scott White Biological Consulting, February 2009)

MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

October 2007
(Revised 2 February 2009)

Prepared for:
Michael Brandman Associates
621 E. Carnegie Dr., Suite 100
San Bernardino, CA 92408

Prepared by:
Scott D. White
SCOTT WHITE BIOLOGICAL CONSULTING
201 North First Ave., No. 102
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Project site location: USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1 West, portion of Section 13.
APN: 0304-082-04, 0304-091-12, 0304-091-13, 0304-091-21
Owner: RCK Properties, Tim Wood
Applicant: Urban Environs, Redlands, Calif.
Principal Investigator: Scott D. White, Scott White Biological consulting (above).

CERTIFICATION: I hereby certify that the statements furnished in this report and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me and under my direct suprevision. I certify that I have no0t signed a non-disclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.

DATE: 2 Feb 2009 SIGNED: Scott D White
Scott D. White, Report Author

Additional field work performed by:

DATE: 2 Feb 2009 SIGNED: Justin Wood
Justin Wood

MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

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MOON CAMP PROPERTY, FAWNSKIN AREA: VEGETATION AND SPECIAL STATUS PLANTS

Scott D. White
SCOTT WHITE BIOLOGICAL CONSULTING
2 February 2009

II: SUMMARY

This report describes results of field surveys for special status plants at the former Moon Camp site in Fawnskin (unincorporated San Bernardino County, California). The project site is about 62 acres. Several listed threatened or endangered plants occur in specialized habitat types in Big Bear Valley and have been found on the site during previous field surveys. The present field work was completed in 2007, a year of very low rainfall. Thus, these surveys cannot support a conclusion that special status plants may be absent from the site. Despite the poor rainfall, one listed threatened species (ash-gray Indian paintbrush) and apparent genetic intergrades of another listed plant (southern mountain buckwheat) with a common relative were both found on the site. Several other special status plants also were found. The proposed project would directly affect ash-gray Indian paintbrush by taking plants and occupied habitat. It also would indirectly affect ash-gray Indian paintbrush, southern mountain buckwheat intergrades, and pebble plain habitat through a variety of off-site or "edge" effects described in Section VII. of this report. The project also would remove numerous trees subject to regulation under the San Bernardino County Native Plant Protection Policy. Further, the project would necessitate alterations to drainageways that may be subject to state or federal regulation as streambeds, wetlands, or waters of the US. We recommend consulting with local, state, and federal agencies as needed to ensure compliance with these laws and policies. We also recommend follow-up botanical surveys to determine presence or absence of other special status meadow species. In order to mitigate take of federally listed plants, we recommend funding off-site habitat preservation and management at a 3:1 ratio for direct effects and at 1:1 ratio for indirect effects.

III: PROJECT AND PROPERTY DESCRIPTION

The San Bernardino County Planning Department is reviewing an application for residential development on the former Moon Camp site in Fawnskin. The project site is on the north shore of Big Bear Lake, in the eastern part of Fawnskin, in unincorporated San Bernardino County. It is about 62 acres, on both sides of State Highway 38, between Oriole Lane and Polique Canyon Road (on the Fawnskin USGS 7½' quadrangle map, in the north half of Section 13, Township 2N and Range 1W). The project site slopes from north to south. Elevation ranges from about 6750 feet near the lakeshore to about 6,960 feet in the northeastern portion of the site.

The project site is within the Big Bear Lake watershed, mapped and described in the Open Space element to San Bernardino County's General Plan (County of San Bernardino 1991), as follows: "This area includes the entire watershed area of Big Bear Lake, and contains a number of specialized habitat areas, which support a large number of endangered plants and animals (as well as commonly occurring mountain species). Habitat values here should be maintained, potentially by controlling development to prevent damage to important habitat areas."

This report addresses special status plant communities and plant species occurring or potentially occurring on the property and incorporates prior botanical work done at the same property, cited below.

IV. FOCUSED STUDY / SPECIES OF CONCERN

There are four federally listed threatened or endangered plant species nearly endemic to meadows and three endemic to "pebble plain" and similar upland habitats in the Big Bear Valley of the northern San Bernardino Mountains (USDI Fish and Wildlife Service 1984, 1998). In addition, there are numerous other special status plant species occurring in these or other habitats in the Big Bear Valley (Appendix 2). This report focuses primarily on the following listed threatened or endangered plants:

Meadow species:

- San Bernardino bluegrass (*Poa atropurpurea*)
- Bird-foot checkerbloom (*Sidalcea pedata*)
- California dandelion (*Taraxacum californicum*)
- Slender-petaled thelypodium (*Thelypodium stenopetalum*)

Pebble plain species:

- Bear Valley sandwort (*Arenaria ursina*)
- Ash-gray Indian paintbrush (*Castilleja cinerea*)
- Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*)

Several special status plants including ash-gray Indian paintbrush have been reported from the project site in prior botanical surveys (Michael Brandman Associates 2000; White & Leatherman BioServices 2002). White and Leatherman (2002) also mapped the extent of suitable habitat for ash-gray Indian paintbrush, based on the extent of its host plant, Wright's matting buckwheat. Bear Valley sandwort is reported from the site in the California Natural Diversity Data Base (California Department of Fish and Game 2007). None of the listed meadow species are known from the site.

V. METHODS

Scott D. White reviewed available literature to identify special status plants or plant communities known from the project site and vicinity. Literature sources included previous biological reports addressing the site (Michael Brandman Associates 2000; White & Leatherman BioServices 2002), the California Natural Diversity Data Base (California Department of Fish and Game 2007a, USGS Fawnskin, Big Bear City, Big Bear Lake, Butler Peak, Keller Peak, and Moonridge 7½' topo quads), California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (Tibor 2001), the CNPS *Electronic Inventory* (2007, for the same quads) and compendia of special status species published by the US Fish and Wildlife Service (2006) and California Department of Fish and Game (2007b). All species identified by this literature review, and others known from the general region, are included in Appendix 1 or 2 (attached). Appendix 1 lists those species not considered for this report due to elevational or geographic ranges, or specialized habitat requirements not found on the site. Appendix 2 lists special status species known from comparable habitats in the region and summarizes their natural history, conservation status, and occurrence probability on-site.

Scott D. White and Justin Wood (of Scott White Biological Consulting) visited the site on 30 April, 7 June, and 8 August 2007 to view special status habitats (pebble plains), compare present conditions with prior conditions, confirm presence of special status plants described from the site in prior reports, and to survey for additional special status plants not found during earlier surveys. During these visits we focused our attention on pebble plains and lakeshore areas, which could support listed threatened or endangered species. We walked over all pebble plain habitat on all three

field dates, and the entire length of the lakeshore on the project site on 30 April and 7 June. All plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in Hickman (1993), Munz (1974), Abrams (1923-1960), and other regional references. All species noted on the site are listed in Appendix 3.

In conformance with California Department of Fish and Game guidelines (2000), surveys were (a) conducted during flowering seasons for the special status plants known from the area, (b) floristic in nature, (c) consistent with conservation ethics, (d) systematically covered all habitat types on the site, and (e) well documented, by this report. However, due to very low rainfall in 2006-2007 (when current surveys were done) and 2001-02 (the year of previous White & Leatherman surveys), results of these field surveys should not be used to conclude "absence" for any special status plants not found.

White and Leatherman BioServices (2002) mapped pebble plain habitat and open upland habitat supporting Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*). That mapping is incorporated here as base maps for rare plant occurrences and habitat on the site.

VI. RESULTS

Utility of field surveys during 2007 was limited on this site and throughout southern California due to a very poor rainfall year. Previous botanical field work was completed during 2002, also a drought year. Many plant species are either annual (i.e., complete their life cycles in a single year and then die) or perennial herbs (i.e., die back to the ground level each year, and persist as underground bulbs or rootcrowns). In poor rainfall years, annual and perennial herbs may not be visible, though they may exist in the soil as inactive seed, bulbs, or rootcrowns. Most of the special status plants of the Big Bear area are perennial herbs (see text below), and we were not able to make conclusive determinations of "present" or "absent" based on these field surveys. Instead, we have used previous reports and our own judgement of habitat quality to estimate the probability that each special status plant might occur on the site.

VI. A. VEGETATION

VI. A. 1. Common Vegetation Types

Jeffrey pine forest: Most of the site above Highway 38 is covered by the Jeffrey pine series (Sawyer and Keeler-Wolf 1995). This vegetation also matches descriptions of Jeffrey pine forest (Holland 1986; McBride 1988), and montane coniferous forest (Munz 1959). Jeffrey pine forest covers most of the eastern half of the project site and occurs in patches interspersed with pebble plains (below) in the western half. Jeffrey pine (*Pinus jeffreyi*) is the dominant tree; white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occur throughout Jeffrey pine forest, at lower densities. The understory is sparse, consisting of scattered shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), cupleaf ceanothus (*C. greggii*), deer brush (*C. integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*C. ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbes in scattered patches. Jeffrey pine forest occurs in mountains throughout most of California at elevations between about 5000 and 9000 feet. Many local and regional associations have been described (Sawyer and Keeler-Wolf 1995).

Some, but not all, of the Jeffrey pine forest on the Moon Camp site provides suitable habitat for listed threatened or endangered plant species. In particular, areas of fairly open forest cover where Wright's matting buckwheat occurs are suitable for ash-gray paintbrush, a federally listed threatened species occurring in pebble plains (below) and open Jeffrey pine forest. These areas are identified on

Figure 3. Other special status plants, but not listed species, could also occur throughout the remainder of mapped Jeffrey pine forest.

Lake Shoreline: In the western half of the property, the site's southern boundary is at the shore of Big Bear Lake. Most plants along the shore itself are herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium ciliatum*), wire-grass (*Juncus arcticus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Numerous seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*) also occur there.

Just above the high-water level, there are small patches of various upland and wetland vegetation types. These patches are too small to map. Small areas of Jeffrey pine forest are interspersed with open wet meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*). There are no alkaline meadows or dry meadows (below) along the lake shore. Small patches of wet meadows may provide suitable habitat for several special status plants (below), but we were unable to determine whether they are present or absent due to poor rainfall.

VI. A. 2. Special-status Vegetation

Pebble Plain: Pebble plain occurs in a single patch at the crest of a hill, in the western portion of the site north of Highway 38 (Figure 3). Pebble plain (also called pavement plain) was described by Derby and Wilson (1978, 1979). A detailed discussion was prepared by the San Bernardino National Forest (1990) and brief descriptions appear in Holland (1986) and Sawyer and Keeler-Wolf (1995) . The substrate consists of clay soil with quartzite pebbles and gravel that are continually pushed to the surface, evidently through frost action (Holland 1986). Vegetation structure on these sites is similar to the mat-forming structure of alpine sites at much higher elevations. Vegetation consists largely of well-spaced cushion-forming perennials and a variety of tiny annuals. Bunchgrasses and some succulents may also occur. At least two species, both listed as endangered, are strictly endemic to Big Bear pebble plain habitats: Bear Valley sandwort and southern mountain buckwheat (Derby and Wilson 1978). Several other special status plants, including other listed threatened or endangered species, also occur on pebble plain habitat.

On the Moon Camp site, much of the pebble plain habitat has been disturbed by vehicles. This disturbance has reduced vegetation cover, disturbed the natural hydrologic pattern, and perhaps reduced habitat quality for special status plants (San Bernardino National Forest 1990). Based on National Forest management efforts at other sites, vehicle disturbance apparently does not permanently alter habitat suitability for these species. For example, the Forest Service has fenced degraded pebble plains in the Sugarloaf area and found that plant diversity returns after a few years.

Our habitat map (Figure 3) indicates pebble plains themselves, and also indicates adjacent open forest with high cover of Wright's matting buckwheat, where we observed suitable habitat for species which tend to occur in both pebble plains and adjacent open forest habitat.

Pebble plains of the Big Bear area (above) are classified as "southern montane black sagebrush pebble plains" by CDFG (2002), "a series or association considered rare and worthy of consideration" by the California Natural Diversity Data Base. Pebble plains on the project site support at least one listed threatened plant, possibly two other listed species, and three other special status plants.

Wet Meadow: Small patches of meadow occur along the lakeshore, south of Highway 38. They grade into upland grasslands, and we could not delineate their extent due to dry conditions. Meadows in the Big Bear Valley may be perennially saturated (i.e., "wet meadows") or may have

saturated soils only seasonally or during wet years (called "dry meadows," "xeric meadows," or "vernal meadows"). Meadows of the San Bernardino Mountains were described by Krantz (1994). They are generally dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.) and grasses (*Poa* spp., *Elymus* spp.). Dry meadows and the margins of wet meadows support sagebrush (*Artemisia tridentata, A. rothrockii*). These meadows themselves are not ranked as special status communities by CDFG (2002) but several locally endemic plants occur in them and they therefore are recognized locally as important habitats (Krantz, no date). Three listed threatened or endangered plants of wet meadow habitats could occur on the Moon Camp site, though only with low or moderate probabilities: bird's foot checkerbloom (*Sidalcea pedata*), San Bernardino bluegrass (*Poa atropurpurea*), and California dandelion (*Taraxacum californicum*). Other special status or listed species of pebble plains and their margins could also occur in meadow margins (e.g., ash-gray paintbrush).

VI. B. Special status plants

Plant or animal species identified by state or federal agencies or by private conservation organizations may be assigned special conservation status due to declining numbers, vulnerability to habitat change, or restricted distributions. Some species are listed as threatened or endangered under state or federal Endangered Species Acts. Other special status plants are included in the California Native Plant Society's *Inventory* or other compilations listed in the Methods section (above) and summarized in Appendix 2. Big Bear Valley has a high proportion of rare and locally endemic species (Krantz, no date; Krantz 1994). Each special status plant species is addressed in Appendix 1 or 2 (habitat and range, agency status and probability of occurring on the site). Species observed on the site and listed or candidate species potentially occurring on the site are also described below.

VI. B. 1. Listed threatened or endangered plants occurring on the site:

Ash-gray Indian paintbrush (*Castilleja cinerea*): Ash-gray Indian paintbrush is a federally-listed threatened species and is on CNPS's List 1B. It is a root parasite on other plants, often parasitizing the listed threatened southern Mountain buckwheat (below) or a similar but common mat-forming buckwheat (*E. wrightii* ssp. *subscaposum*). It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows and seeps, and open pinyon or Jeffrey pine forest between about 5,900 and 10,000 feet elevation. It is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). It was reported and mapped on the project site by Michael Brandman Associates (2000) and in the California Natural Diversity Data Base (2007). White & Leatherman BioServices (2002) found that it was more widespread than reported earlier, occurring in the pebble plains and open pine forests (Figure 3), where it appears to be parasitizing *Eriogonum wrightii* ssp. *subscaposum.* We confirmed these occurrences and noted no substantial changes to densities or distribution in 2007.

Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*): Southern mountain buckwheat is federally listed as threatened and is on CNPS's List 1B. It is a mat-forming woody perennial, generally flowering late in the season (between about June and August). It is endemic to pebble plains habitats in Big Bear and Holcomb valleys in the San Bernardino Mountains, between about 5800 and 7500 feet elevation. It often serves as a host plant for the hemi-parasitic *Castilleja cinerea* (above) and also is a food plant for a newly described locally-endemic San Bernardino blue butterfly. It is very similar to a more common plant, Wright's matting buckwheat (*E. wrightii* ssp. *subscaposum*), which is common on the project site. The two species are distinguished by presence or absence of branching in their inflorescences (Hickman 1993; Reveal 1989, 2005). We examined flowers and remains of dried inflorescences of mat-forming buckwheats throughout the project site

on each site visit. Most of them were either unidentifiable (due to absence of inflorescences) or were identified as Wright's matting buckwheat, based on their branching inflorescences. But on the mapped pebble plain (Figure 3), during the 8 August site visit, about 10-20% of the matting buckwheat plants had mostly (but not exclusively) unbranched inflorescences. Reveal (2005) noted that the two plants intergrade to some extent in Big Bear Valley and A. Sanders (pers. comm.) has made similar observations. We conclude that some of the matting buckwheats on pebble plains at the Moon Camp site are intergradations between the endangered southern mountain buckwheat and the common Wright's matting buckwheat.

VI. B. 2. Special status plants occurring on the site but not listed as threatened or endangered:

Parish's rock-cress (*Arabis parishii*): Parish's rock cress is CNPS's List 1B. It is a perennial herb that typically blooms in April or May. It occurs in pebble plains and other sites with heavy or rocky soils, including carbonate soils, within pinyon woodlands and montane forests between about 3,900 and 8,000 feet elevation. It is endemic to the San Bernardino Mountains. Suitable habitat occurs on the project site in areas shown as ash-gray paintbrush habitat on Figure 3. It has been reported from the site (CNDDB 2001). White & Leatherman BioServices (2002) observed it uncommonly, scattered throughout pebble plain and adjacent open forest habitat. We confirmed these occurrences and noted no substantial changes to densities or distribution in 2007.

Big Bear Valley woollypod (*Astragalus leucolobus*): Big Bear Valley woollypod is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in rocky soils of montane conifer forests and woodlands and pebble plains, between about 5,600 and 8,000 feet elevation. It is endemic to the high mountains of southern California (San Bernardino, San Gabriel, San Jacinto, and Santa Rosa Mountains). Suitable habitat is found throughout the site. White & Leatherman BioServices (2002) observed it occasionally throughout the project site. We confirmed these occurrences and noted that it was especially common on pebble plains in 2007.

Heckard's paintbrush (*Castilleja montigena, C. applegateii* ssp. *martinii*): Heckard's paintbrush is on CNPS's List 4. It is a perennial herb, typically flowering between May and August. It occurs in montane forests between about 6400 and 9200 feet elevation. It is endemic to the San Bernardino Mountains, where it is common in forest habitats throughout the mountain range. It was originally described by Lawrence Heckard (1980), but Heckard regarded it as a minor variant of *Castilleja applegateii* and not as a distinct species in his Jepson Manual treatment of the genus (1993). It occurs occasionally in Jeffery pine forest on the Moon Camp site.

Silver-Haired ivesia (*Ivesia argyrocoma*): Silver-haired ivesia is on CNPS's List 1B. It is a perennial herb that typically blooms between June and August. It occurs in alkaline meadows and seeps, pebble plains, and montane forest between about 4900 and 8800 feet elevation. It occurs in the San Bernardino Mountains and a disjunct site in the mountains of Baja California. It has been reported from the project site by Michael Brandman Associates (2000) and White and Leatherman BioServices (2002), and we observed it throughout areas shown as ash-gray paintbrush habitat on Figure 3.

VI. B. 3. Listed and candidate threatened or endangered plants potentially occurring on the site:

Bear Valley sandwort (*Arenaria ursina*): Bear valley sandwort is federally-listed as threatened and is on CNPS's List 1B. It is a perennial herb and typically blooms between May and August. It occurs on pebble plains and sometimes on carbonate soils, between about 6,400 and 6,900 feet elevation. It is endemic to Big Bear Valley in the San Bernardino Mountains. It has been reported from the Moon Camp site (CNDDB 2007), but we did not find it on the site in 2007 and it was not noted there by Michael Brandman Associates (2000) or White & Leatherman BioServices (2002).

Due to poor rainfall in 2001-02 and 2006-07, we cannot evaluate whether Bear Valley sandwort was absent during these field surveys due to its disappearance from the site or due to drought-induced dormancy. Suitable habitat occurs in pebble plains on the project site, and we conclude that it has a high probability of occurring.

San Bernardino bluegrass (*Poa atropurpurea*): San Bernardino bluegrass is a federally-listed Endangered species and is on CNPS's List 1B. It is a rhizomatous perennial grass that typically flowers between May and June. It occurs in mesic meadows and seeps between about 4,400 and 8,100 feet elevation. It is known only from the San Bernardino Mountains and Laguna mountains (San Diego County). Marginally suitable habitat occurs along the lakeshore areas on the project site. We did not find it during our field surveys, but we also could not find it at a known occurrence in the area, perhaps due to drought-induced dormancy. Based on habitat, we conclude there is a low probability that it may occur there.

Bird's foot checkerbloom (*Sidalcea pedata*): Bird's foot checkerbloom is a federally- and state-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It occurs in meadows and seeps, between about 5,200 and 8,100 feet elevation. It is endemic to the San Bernardino Mountains. Marginally suitable habitat occurs near the lakeshore, though we did not find bird's foot checkerbloom during our field surveys, and it has not been reported there in prior surveys. Based on habitat, we conclude there is a low probability that it may occur.

California dandelion (*Taraxacum californicum*): California dandelion is a federally-listed endangered species and is on CNPS's List 1B. It is a perennial herb that typically blooms between May and July. It is endemic to the San Bernardino Mountains, occurring only in and around Big Bear Valley, in meadows and seeps between about 6,300 and 7,800 feet elevation. Marginally suitable habitat occurs in meadow areas near the lakeshore, though the species was not noted during our field surveys or reported in prior surveys. Based on habitat, we conclude there is a low to moderate probability that it may occur on the site.

VI. B. 4. Special status plants potentially occurring but not listed as threatened or endangered:

Other special status plant species judged as moderate or greater probability of occurring on the site, but not seen during field surveys and not listed as threatened or endangered are listed below. See also Appendix 2.

Rock sandwort (*Arenaria lanuginosa* ssp. *saxosa*): Moderate probability (meadow, lakeshore)
Crested milk vetch (*Astragalus bicristatus*): High probability (rocky areas)
Big Bear Valley milk vetch (*Astragalus lentiginosus* var. *sierrae*): High probability, open forest
Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*): Moderate probability, meadow
Western sedge (*Carex occidentalis*): Moderate probability, meadow
San Bernardino Mountain owl's clover (*Castilleja lasiorhyncha*): Moderate probability, meadow
San Bernardino Mountains dudleya (*Dudleya abramsii* ssp. *affinis*): Moderate probability, pebble plains
Southern Sierra woolly sunflower (*Eriophyllum lanatum* var. *obovatum*): High probability, forest
Jepson's bedstraw (*Galium jepsonii*): High probability, forest
Johnston's bedstraw (*Galium johnstonii*): Low to moderate probability, forest
Parry's sunflower (*Hulsea vestita* ssp. *parryi*): Low to moderate probability (open slopes)
Duran's rush (*Juncus duranii*): Moderate probability, meadow
Short-sepaled lewisia (*Lewisia brachycalyx*): Moderate probability, meadow
Baldwin Lake linanthus (*Linanthus killipii*): High probability on pebble plains

San Bernardino Mountain monkeyflower (*Mimulus exiguus*): High probability, meadow margin, etc.
Purple monkeyflower (*Mimulus purpureus*): High probability, meadow margin, etc.
Chickweed oxytheca (*Oxytheca caryophylloides*): High probability, open forest
Parish's yampah (*Perideridia parishii* ssp. *parishii*): Low to moderate probability, meadow
Transverse Range phacelia: (*Phacelia exilis*): High probability, meadow margin, etc.
Mojave phacelia (*Phacelia mohavensis*): High probability, meadow margin, etc.
Bear Valley phlox (*Phlox dolichantha*): High probability, throughout
Bear Valley pyrrocoma (*Pyrrocoma uniflora* ssp. *gossypina*): Low - moderate probability, meadow
Parish's rupertia (*Rupertia rigida*): High probability, throughout
Tehachapi ragwort (*Senecio ionophyllus*): Moderate probability, throughout
Laguna Mountains jewelflower (*Streptanthus bernardinus*): Moderate probability, forest
Southern jewelflower (*Streptanthus campestris*): High probability, forest
Pine green-gentian (*Swertia neglecta*): High probability, forest
Small-flowered bluecurls (*Trichostema micranthum*): High probability, meadow

VI. C. PROTECTED PLANTS

The San Bernardino County Plant Protection and Management policy (2007) regulates removal of native trees greater than 6 inches diameter at breast height (dbh). Jeffrey pines and other native forest trees greater than 6 inches dbh occur throughout the site.

VII. IMPACTS

VII. A. Impacts to Special Status Plants and Habitat

Project construction would result in grading new roads, driveways and building pads throughout most of the property, removing much of the native vegetation, including special status plants and habitat, and disturbing soils throughout most of the site. Even where special status plants are not removed by grading, most future land uses on individual lots (e.g., landscaping) would not be subject to environmental review and would cause further loss of these plants and habitats. Indirect project impacts (i.e., impacts outside the proposed residential lots and limits of grading) would affect rare plant habitat in a proposed set-aside area and, if it occurs, off-site to the north. Thus, project impacts would eliminate or degrade sensitive habitat types (pebble plain) and occupied rare plant habitat (Figure 3, Figure 5). Pebble plains and open forest patches on the site are occupied by at least one threatened or endangered plant (ash-gray Indian paintbrush); genetic intergrades of another listed plant (southern mountain buckwheat) with a common related species; and four other special status plants (Parish's rock-cress, Heckard's paintbrush, Bear Valley woollypod and silver-haired ivesia). Development would eliminate or substantially reduce numbers of all five plants. Although these habitats are somewhat degraded by vehicles and invasive plants (see Section VI. A. above and "edge effects," below), adverse impacts to listed species would meet the CEQA threshold for mandatory findings of significance.

Construction could also eliminate or substantially reduce numbers of five other listed threatened or endangered plants that could occur on the site but were not found there, including Bear Valley sandwort, southern mountain buckwheat, bird-foot checkerbloom, San Bernardino bluegrass, and California dandelion. The maximum possible extent of these impacts, if all four plants occur, would be loss of Bear Valley sandwort and southern mountain buckwheat in pebble plains areas discussed above, and possible loss of bird-foot checkerbloom, San Bernardino bluegrass, and California dandelion from small meadow areas bordering the lakeshore. These impacts would meet the CEQA threshold for mandatory findings of significance if any of these listed plants occur on the site.

Impacts to special status plants not listed as threatened or endangered (Section IV. B. 4.) generally would not meet the CEQA threshold for mandatory findings of significance.

Adverse project impacts to pebble plains and rare plants occurring (or potentially occurring) on pebble plains are somewhat reduced by the project's design, which designates an open space lot on the pebble plain area and part of the occupied ash-gray Indian paintbrush habitat (Figure 3). However, the long-term conservation value of the proposed open space lot would be minimal without designating buffer areas and providing for active on-site land management to prevent indirect "edge effects" of existing and proposed new adjacent land uses.

The term "edge effect" describes the effects of developed land uses on adjacent natural habitat areas (e.g., habitat adjacent to new development or in set-aside areas surrounded by development). To date, most analyses of edge effects on habitat reserves have focused on sensitive wildlife species. The following discussion of edge effects on rare plants is based on an analysis by the Conservation Biology Institute (2000) addressing San Fernando Valley spineflower, an endemic southern California species threatened by development and surrounding land uses in Los Angeles and Ventura Counties. Rare plants near developed lands tend to die out due to a variety of edge effects, including:

- Exclusion by invasive weedy plants introduced deliberately or accidently into developed landscapes.
- Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation.
- Altered hydrology caused by irrigation overspray, road runoff, or water diversions installed for erosion control.
- Direct damage by pets and feral animals (e.g., digging by dogs and cats).
- Indirect effects of non-native animals, such as elimination of native pollinators by invasive Argentine ants.
- Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes.
- Pollution from oversprayed or runoff landscaping chemicals (insecticides, herbicides, fertilizers).

Conservation planners design "buffer areas" to separate managed sensitive species or habitat reserve areas from the indirect effects of adjacent land uses. The Conservation Biology Institute (2000) modeled "buffer areas" for then-proposed San Fernando Valley spineflower preserve areas in Ventura County. In their analysis, buffer areas were defined as preserved land surrounding the rare plants, where land uses were strictly limited to activities consistent with reserve management. For example, buffer areas function to separate rare plant habitat from adverse effects of weeds propagating along trails or through fuel modification zones. Thus, roads, trails, or fuel modification land uses are not consistent with buffer function. The Conservation Biology Institute analysis (2000) estimated that buffer widths of 200 feet would be "highly likely to be effective" in buffering San Fernando Valley spineflower occurrences from a series of adverse edge effects from adjacent land uses, and "moderately effective" against two adverse edge effects (invasive animals and increased fire frequency). In their analysis, a wider hypothetical buffer (300 ft.) would not increase estimated effectiveness against fire and invasive animals. We therefore use 200 feet as the best available estimate of the range of adverse edge effects on special status plant occurrences.

The proposed project could also cause "edge effects" to proposed open space on-site and to adjacent vacant land to the north and east as new residents increase activity and disturbance to surrounding native habitat, through the effects listed above.

Most land surrounding the Moon Camp site is in private ownership, except in the northeastern

corner where National Forest land is adjacent to the north and east. None of the surrounding private land is managed or proposed for management as a conservation area. Most adjacent private land on all sides has been developed. There is a pebble plain area on National Forest land on the ridge north of the Moon Camp site, but it is more than 200 feet from the project site and thus should be sufficiently buffered from project-related edge effects. We conclude that the proposed project's off-site edge effects would not meet the CEQA threshold for mandatory findings of significance.

Much of the Moon Camp project site, including the proposed open space lot on-site, is now subject to edge effects of adjacent residential development and roads, especially Highway 38 (Figure 4). The proposed project would eliminate or further degrade most remaining occupied rare plant habitat (above) and would indirectly affect nearly all of the proposed open space lot by introducing new edge effects closer to the open space area (Figure 5). The small portion of the proposed open space lot not within 200 feet of proposed new development is already within 200 feet of Highway 38 and thus subject to existing edge effects (Figures 4 and 5).

VII. B. Impacts to Protected Plants

Tract Map approval and subsequent construction would cause substantial reduction in Jeffrey pine forest tree canopy cover throughout most of the site. This impact would not necessarily be regarded as significant under CEQA, but could conflict with San Bernardino County's general plan and would require permitting under the County's Native Plant Protection policy.

VII. C. Impacts to Jurisdictional Streambeds

Road construction and other elements of the project would alter ephemeral channels, and possibly to meadows or other lakeshore habitat that may meet state or federal jurisdictional criteria as streambeds, wetlands, or waters of the United States. These impacts would not necessarily be regarded as significant under CEQA, but could require permitting under Section 1603 of the California Fish and Game Code or Section 404 of the federal Clean Water Act through the California Department of Fish and Game or US Army Corps of Engineers, respectively.

VIII. RECOMMENDED AGENCY CONSULTATION OR FURTHER STUDIES

1. To minimize loss of forest canopy on the property, we recommend mapping and inventorying trees on the site, and designing roads and building sites to minimize the number of overstory trees to be removed. Once those trees that must be removed are identified, we recommend applying to San Bernardino County for applicable permits under the County's native plant protection policy.

2. We recommend preparing a delineation of jurisdictional streambeds, wetlands, and waters of the United States to determine whether Section 1603 of the California Fish and Game Code or Section 404 of the federal Clean Water Act are applicable on the property. The delineation report should address channels crossing the site and the lakeshore area described in this report.

3. The project would take at least one federally listed plant (ash-gray Indian paintbrush) and its occupied habitat through direct impacts (occurrences within proposed roadways or residential lots) and possibly two other federally listed plants (Bear Valley sandwort and southern mountain buckwheat) through indirect impacts to the proposed open space lot. If project development requires permitting or funding through any federal agency (e.g., the Army Corps of Engineers under Section 404 of the federal Clean Water Act) then that agency must consult with the US Fish and Wildlife Service under Section 7 of the federal Endangered Species Act.

4. Field surveys to date have occurred in very dry years and have been unable to determine presence or absence of several listed threatened or endangered plants and numerous other special status plants. We recommend further botanical surveys for these species (Sections V. B. III. and V.

B. IV., above) , to be conduced in accordance with California Department of Fish and Game (2000) guidelines. These follow-up surveys should be done in a year when precipitation is at least 40% of average for the area over the "rainfall year" period (1 July - 30 June).

IX. MITIGATION AND MONITORING RECOMMENDATIONS

IX. A. MITIGATION RECOMMENDATIONS

Under CEQA Guidelines, if a project would "reduce the number or restrict the range of a threatened or endangered species," then a lead agency must find that the project would have a significant effect. Without mitigation, the proposed development would meet this criterion for mandatory findings of significance, due to adverse impacts to the threatened ash-gray Indian paintbrush, and potential adverse impacts to listed plants not found on the site. CEQA defines mitigation as (a) avoiding the impact altogether by not taking a certain action or parts of an action, (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation, (c) rectifying the impact by repairing, rehabilitating, or restoring the impacted environment, (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, or (e) compensating for the impact by replacing or providing substitute resources or environments. Potential application of these five types of mitigation to the proposed project are addressed below:

Avoidance or Minimization: Avoiding or minimizing impacts to the occupied listed plant habitat would necessitate either abandoning the project or redesigning it to eliminate or minimize grading or other disturbance (including long-term edge effects of new development) to soils and hydrology on the occupied habitat and throughout a substantial buffer area. These measures would substantially reduce project feasibility and, even if implemented, long term persistence of the listed plants would be doubtful due to isolation caused by existing and proposed development.

Rectifying the impact or reducing it over time: Both these types of mitigation apply only to temporary disturbances (e.g., pipeline construction, in which the disturbed ground may be revegetated following construction). These measures are not applicable for the proposed Moon Camp project.

Compensating for the impact: Compensation is widely used as mitigation for impacts to threatened or endangered species, both as mitigation for CEQA analysis and as Habitat Conservation Plans (HCPs) negotiated with the US Fish and Wildlife Service under the federal Endangered Species Act, if protection of sufficient off-site habitat can be achieved. Typically, mitigation ratios are about 3:1 (i.e., 3 acres of habitat purchased or protected for each acre lost to development).

Off-site protection is a viable measure for impacts to ash-gray Indian paintbrush and other regionally endemic threatened or endangered plants potentially occurring on the site. The San Bernardino National Forest actively manages other sites to preserve pebble plain endemic plants, including ash-gray paintbrush. Numerous other privately-owned sites in the Big Bear Valley support pebble plains where disturbances would be more manageable due to adjacent land uses and relative isolation from developed areas. The California Wildlife Foundation has established a fund, administered by the California Department of Fish and Game, for eventual purchase or protection of pebble plain habitat in the Big Bear area.

We recommend the following measures to mitigate significant or potentially significant adverse impacts to listed threatened or endangered plants:

1. We recommend compensating for anticipated loss of a federally-listed threatened plant (ash-gray Indian paintbrush), loss of pebble plain habitat, and potential impacts to other listed species (Bear Valley sandwort, southern mountain buckwheat) by contributing to the funding of purchase

and management of off-site habitat through the California Wildlife Foundation fund, described above, at a level sufficient to purchase or protect 3 acres of habitat for each acre of pebble plain habitat and ash-gray Indian paintbrush habitat to be developed, and at 1:1 ratio for habitat to be indirectly degraded by edge effects of the proposed development (see Figure 5).

2. If follow-up surveys (Section VIII., above) determine that no other listed plants occur, then we make no further mitigation recommendation. If the surveys determine that one or more listed species occurs in the meadow area, then we recommend delineating the extent of suitable or occupied habitat, evaluating direct or indirect project impacts, and compensating as stated above for impacts to rare plant habitat (i.e., 3:1 for direct impacts, 1:1 for indirect impacts or edge effects).

IX. B. MITIGATION MONITORING RECOMMENDATIONS

California law requires monitoring of mitigation measures imposed under CEQA. We recommend monitoring mitigation measures recommended here to verify compliance with conditions of approval. We recommend that the applicant maintain files of all correspondence with agencies, contractors, or other entities pertaining to compliance with the recommendations above (Section VIII and IX.A.), and provide copies of pertinent correspondence to the County upon completion or resolution of each recommendation.

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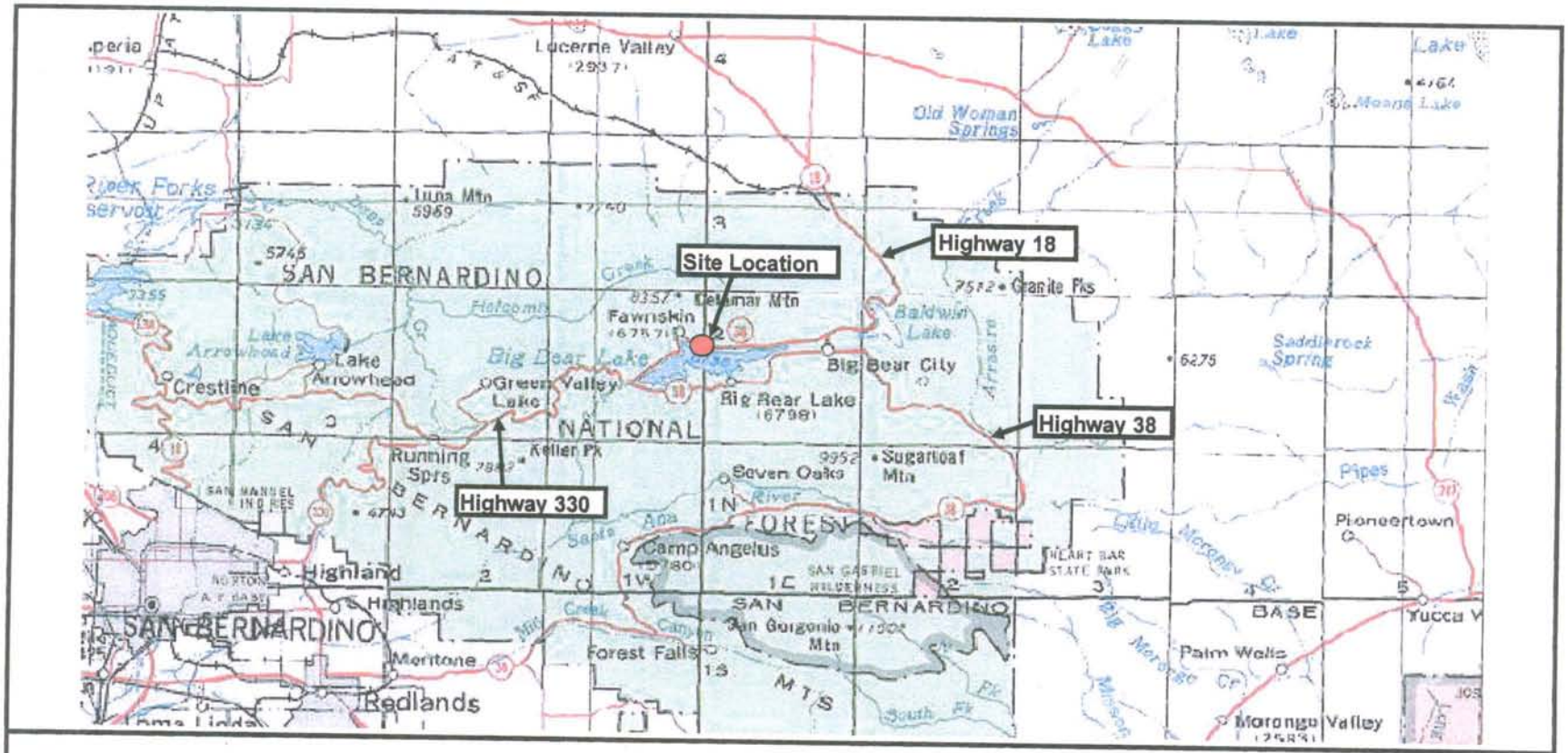
Figure 1:
Vicinity Map



Proposed Moon Camp Tenative Tract

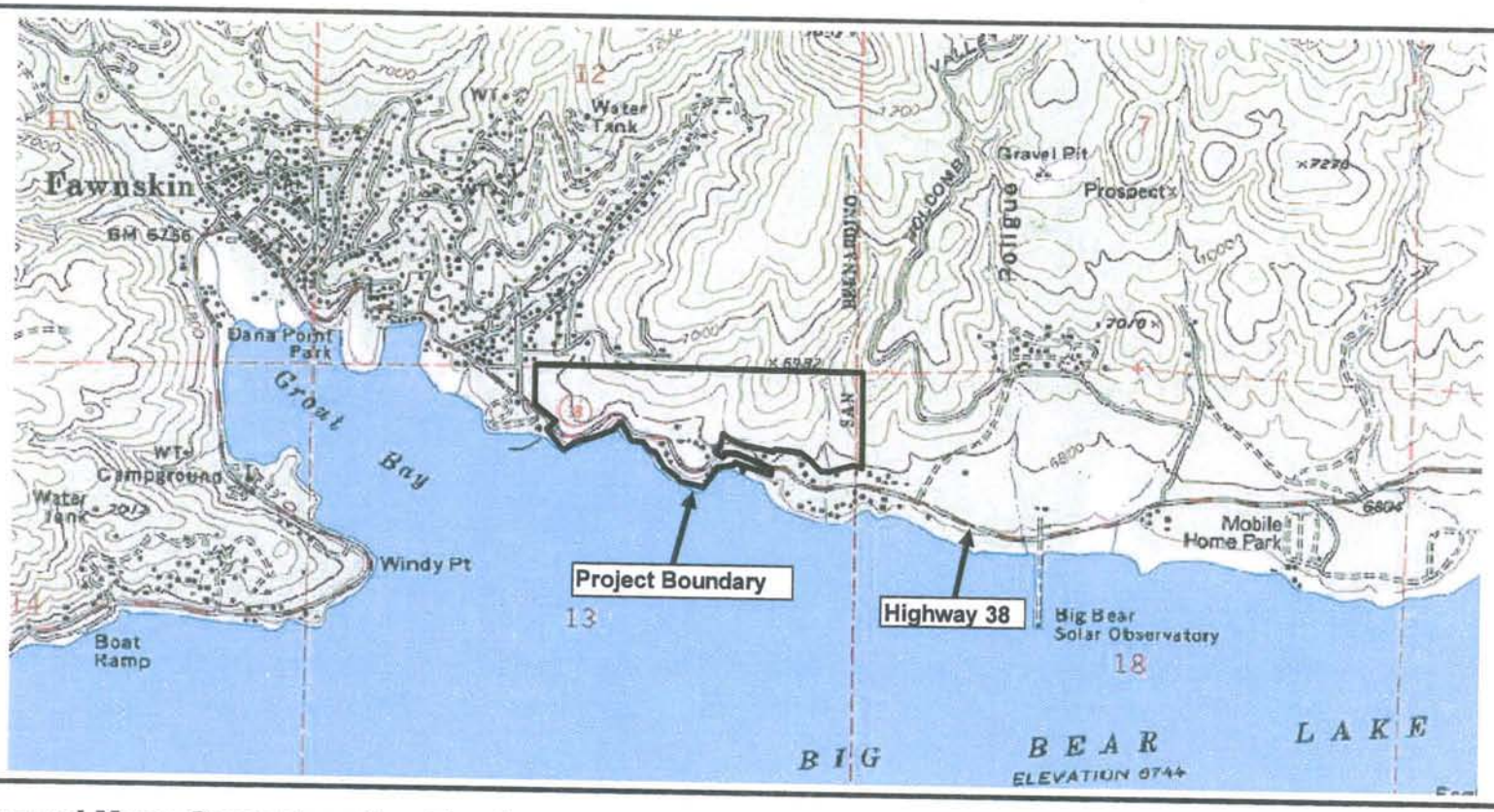
Figure 1: Vicinity Map

Scott White Biological Consulting

Map source: TOPO! 7½ minute topographic
JW: 15 Aug 2007

NORTH

Figure 2:
Project Site Map



Proposed Moon Camp Tenative Tract

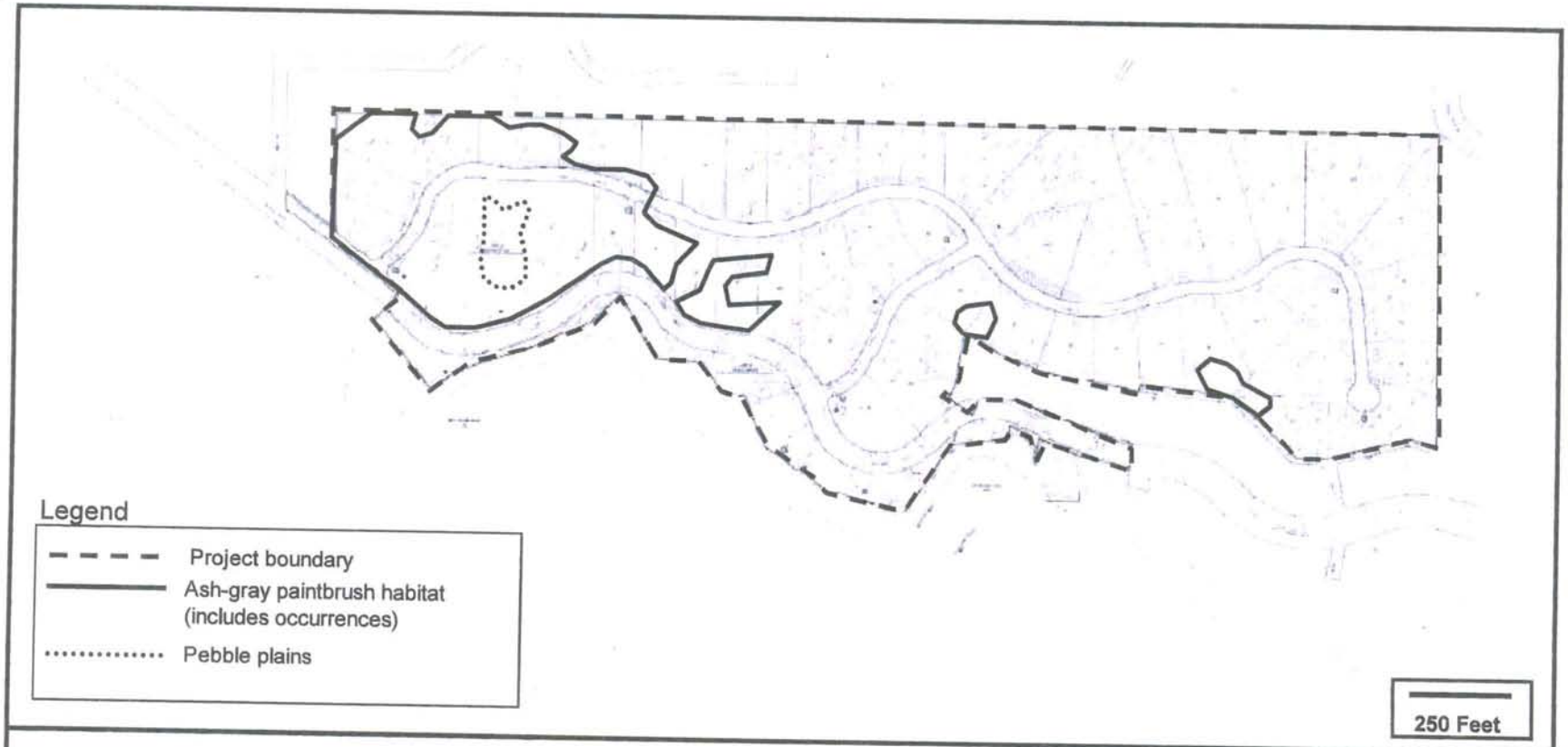
Figure 2: Site Map

Scott White Biological Consulting

Map source: TOPO! 7½ minute topographic, Fawnskin, CA
JW: 15 Aug 2007

NORTH

Figure 3:
Rare Plant Habitat



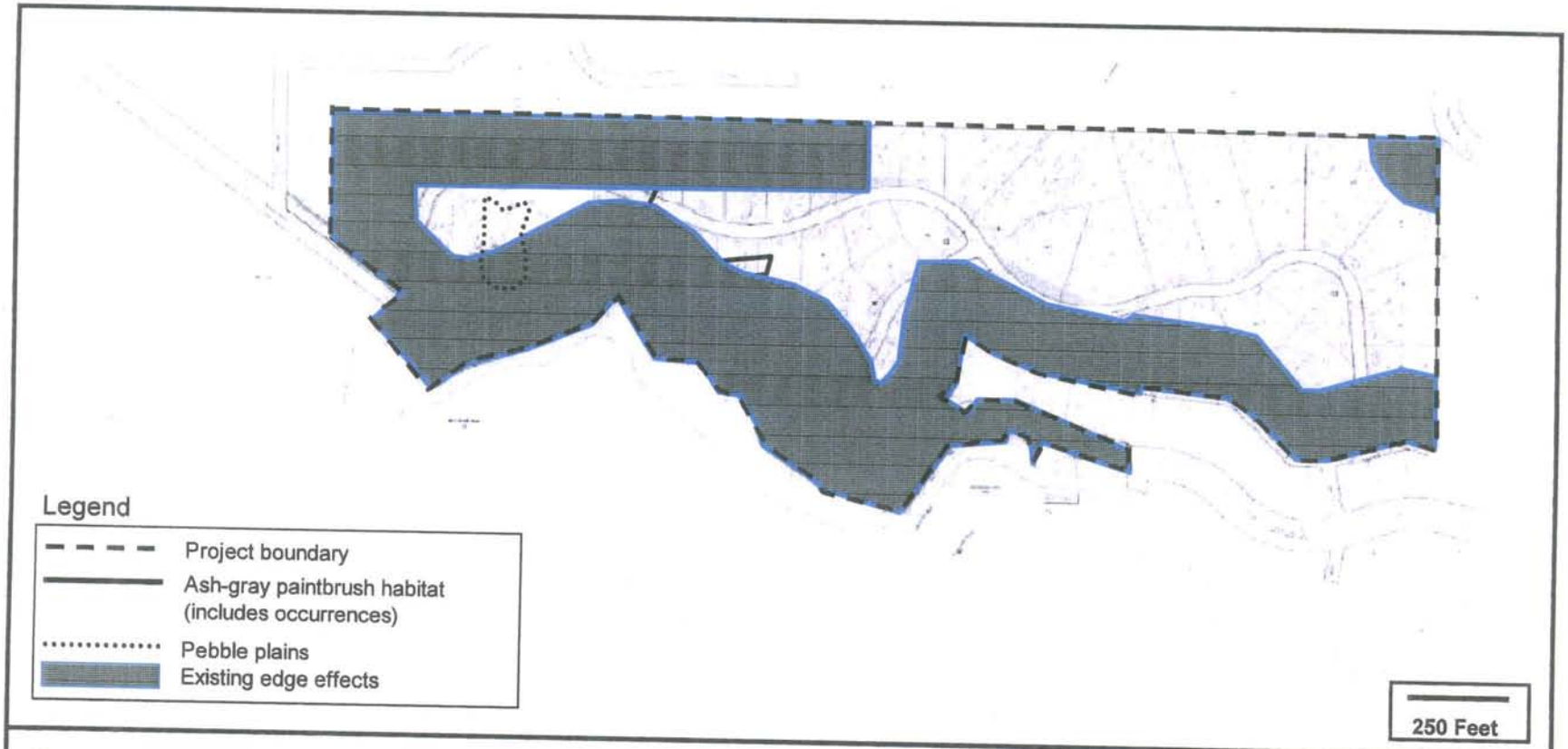
Proposed Moon Camp Tenative Tract

Figure 3: Rare Plant Habitat

Scott White Biological Consulting

Map source: Michael Brandman Associates
JW: 15 Aug 2007

Figure 4:
Edge Effect Map



Proposed Moon Camp Tenative Tract

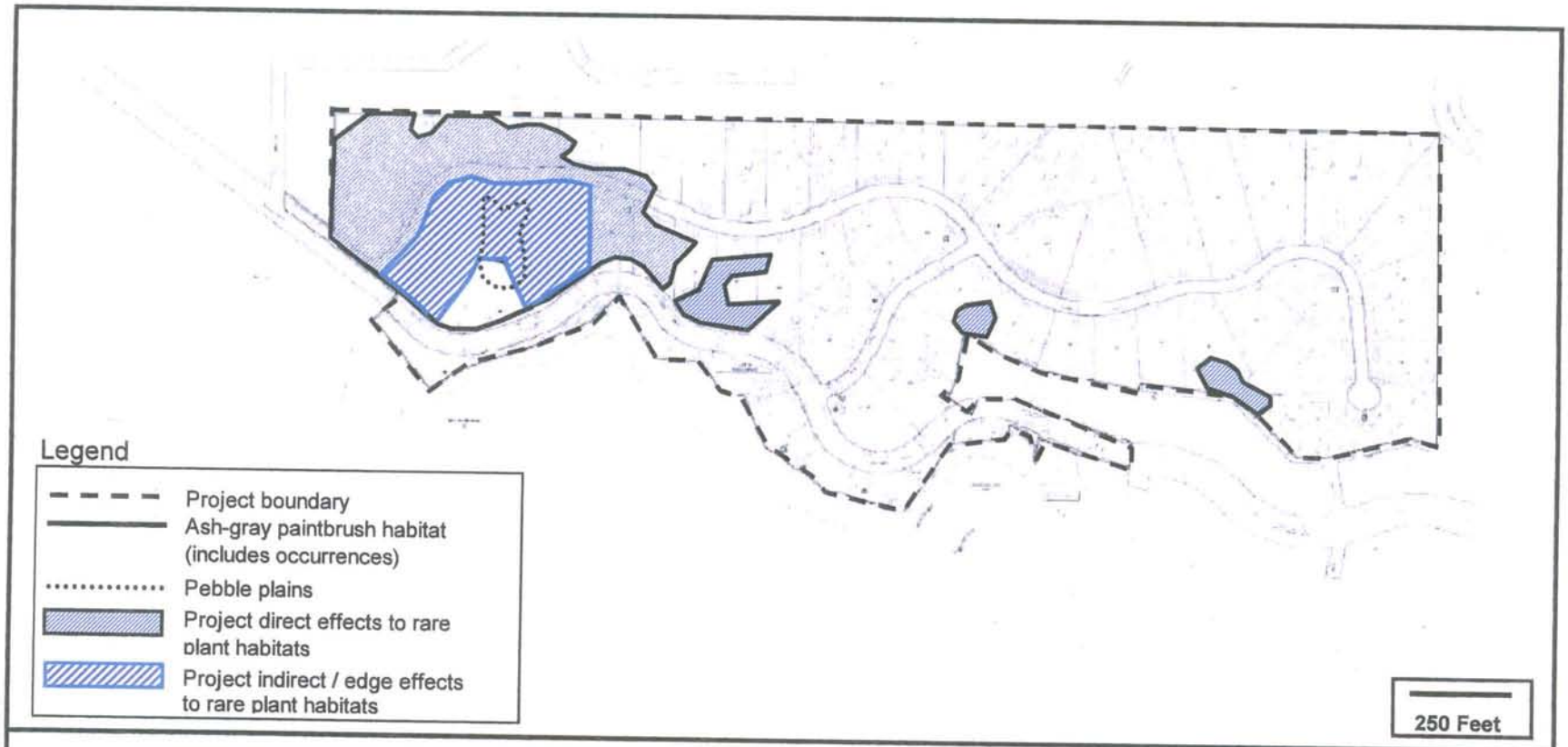
Figure 4: Existing Edge Effects

Scott White Biological Consulting

Map source: Michael Brandman Associates

JW: 15 Aug 2007

Figure 5:
Project Effects



Proposed Moon Camp Tenative Tract

Figure 5: Project Effects

Scott White Biological Consulting

Map source: Michael Brandman Associates
JW: 15 Aug 2007

Appendix 1:
Special Status Species Not Addressed

Appendix 1: Special status plants of the Bear Valley region not addressed due to habitat or range.

Common name	Latin name	Reason for exclusion
White-margined everlasting	Antennaria marginata	Outside geogr. range (only local occurrences in Barton Flats area)
Pinyon rock-cress	Arabis dispar	Outside geogr. range (only local occurrences on desert-facing slopes)
Shockley's rock-cress	Arabis shockleyi	Outside geogr. range (only local occurrences on desert-facing slopes)
Cushenbury milk-vetch	Astragalus albens	No suitable habitat (carbonate)
Triple-ribbed milk-vetch	Astragalus tricarinatus	No habitat (desert shrubland), well above elev. range (below about 4000 ft.), Cushenbury Cyn report erroneous
Parish's small-scale	Atriplex parishii	No suitable habitat (alkali sink)
Fremont barberry	Berberis fremontii	No local occurrences (presumed extinct in Cushenbury area)
Scalloped moonwort	Botrychium crenulatum	No suitable habitat (marshes, bogs)
Plummer's mariposa lily	Calochortus plummerae	Above elev. range (below about 5500 ft.)
Alkali mariposa lily	Calochortus striatus	No habitat (desert alkaline meadows, seeps) above elev. range (below about 5300 ft.)
Parish's daisy	Erigeron parishii	No suitable habitat (carbonate)
Cushenbury buckwheat	Eriogonum ovalifolium var. vineum	No suitable habitat (carbonate)
Moss gentian	Gentiana fremontii	Well below elev. range (occurs in San Gorgonio Wilderness)
Los Angeles sunflower	Helianthus nuttallii ssp. parishii	Well above elev. range (below about 4000 ft. elev.)
Barton Flats horkelia	Horkelia wilderae	Outside geogr. range (endemic to Barton Flats area)
California satintail	Imperata brevifolia	Well above elev. range (below about 3000 ft.)
San Bernardino Mtn. bladderpod	Lesquerella kingii ssp. bernardinus	No habitat (carbonate)
Adder's mouth	Malaxis monophyllos ssp. brachypoda	Well below elev. range (occurs in San Gorgonio Wilderness)
Cienega Seca oxythexca	*Oxytheca parishii* var. *cienegensis*	Outside geogr. range (known only from Cienega Seca and Pipes Cyn areas)
Cushenbury oxytheca	Oxytheca parishii var. goodmaniana	No habitat (carbonate)

Appendix 1: Special status plants of the Bear Valley region not addressed due to habitat or range.

Common name	Latin name	Reason for exclusion
Frosted mint	Poliomintha incana	No suitable habitat (desert dunes and sandy flats)
Narrow-leaved cottonwood	Populus angustifolia	No San Bernardino Mountain occurrences (local reports unverified)
Latimer's woodland gilia	Saltugilia latimeri	No habitat (desert shrubland,pinyon woodland); above elev. range (below about 6200 ft.)
Slender-petaled thelypodium	Thelypodium stenopetalum	No habitat (alkaline meadows)

Appendix 2:
Special Status Species

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Abronia nana ssp. *covillei* Coville's dwarf abronia	Perennial herb; carbonate and sandy soils within pinon-juniper woodlands; San Bernardino Mts. and mountains of E Mojave, about 5200 - 10,200 ft.	May - August	Fed: none Calif: S3.2 CNPS List 4.2	Low (marginally suitable habitat)
Allium parishii Parish's onion	Bulb; open shrubland & woodland, gen. sandy bajadas or mtn slopes, often carbonate soil, about 3000 - 5500 ft. elev.; N San Bern Mtns and Moj Des Mtns, to W Ariz.	Apr - May	Fed: none Calif: S3.3? CNPS List 4.3	Minimal (above elev. range)
Arabis parishii Parish's rock cress	Perennial herb; pebble plains, occas. on carbonate soil; open dry sites in conifer forest; about 5800 - 9500 ft. elev.; San Bernardino Mtns. endemic	April - May	Fed: none Calif: S2.1 CNPS List 1B. 2	Occurs (2007 survey; NDDB report)
Arenaria lanuginosa ssp. *saxosa* (*A. confusa*) Rock sandwort	Perennial herb; sandy soils, streams or meadows; about 5900 to 8600 ft. elev.; San Bernardino Mtns, W US and N Baja Calif.	July - Aug	Fed: none Calif: S1.3 CNPS List 2.3	Moderate (moderately suitable habitat)
Arenaria ursina Bear Valley sandwort	Perennial herb, pebble plains, occas. on carbonate soils, about 5900 - 9500 ft. elev.; San Bernardino Mtns. endemic	June - July	Fed: **THR** Calif: S 2.1 CNPS: List 1B.2	Occurs? (NDDB record #23)
Aster bernardinus (*Symphyotrichum defoliatum*) San Bernardino aster	Perennial herb; wetlands and margins, near sea level to about 6700 ft. elev.; formerly widespread, Kern Co to San Diego Co, but most sites extirpated	July - Nov	Fed: none Calif: S 3.2 CNPS List 1B.2	Low (field surveys; upper margin of elev. range)
Astragalus bicristatus Crested milk vetch	Perennial herb; rocky slopes, montane conifer forest; about 5500 - 9000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	May - August	Fed: none Calif: S3.3 CNPS List 4.3	High (suitable habitat occurs)
Astragalus lentiginosus var. *sierrae* Big Bear Valley milk vetch	Perennial herb; open rocky soils or compacted areas in pine forest; about 5900 - 8500 ft. elev.; San Bernardino Mtns endemic	April - August	Fed: none Calif: S1? CNPS List 1B.2	High (suitable habitat occurs)
Astragalus leucolobus Bear Valley woollypod	Perennial herb; open or disturbed soils, pine forests and sagebrush scrub, about 5600-8800 ft. elev.; San Gabriel Mtns to Santa Rosa Mtns	May - July	Fed: none Calif: S 2.2 CNPS List 1B.2	Occurs
Calochortus palmeri vars. *palmeri* and *munzii* Palmer's & Munz's mariposa lilies	Bulb; meadows or seasonally moist sites; about 3300 - 7200 ft. elev.; var. *palmeri* occurs S Coast & Transverse Ranges, reported but not verified San Jacinto Mtns; var. *munzii* endemic to San Jacintos, reported but not verified in San Bernardinos	May - July	Fed: none CNPS List 1B.2 var *palmeri*: Calif: S 2.1 var. *munzii*: Calif: S 1.2	Moderate (marginally suitable habitat)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Carex occidentalis Western sedge	Rhizomatous perennial; meadows & seeps; San Bernardino Mtns, White Mtns, scattered in western states; about 6200 - 10,300 ft. elev.	June - Aug	Fed: none Calif: S2S3 CNPS List 2.3	Moderate (marginal habitat)
Castilleja cinerea Ash-gray Indian paintbrush	Perennial herb; pebble plains, dry meadows, about 5900 to 9100 ft. elev.; partially parasitic usually on matting buckwheats; San Bernardino Mtns endemic	May - August	Fed: THR Calif: S2.2 CNPS List 1B.2	Occurs (field survey and CNDDB report)
Castilleja lasiorhyncha (*Orthocarpus lasiorhynchus*) San Bernardino Mountain owl's clover	Annual; meadows, streamsides, seeps, etc., about 4200-7800 ft. elev.; San Bernardino Mtns. and (historically) San Jacinto Mtns.; reports from San Diego Co. unconfirmed	June - Aug	Fed: none Calif: S2.2 CNPS List 1B.2	Moderate (marginal habitat)
Castilleja applegateii ssp. *martinii* × *C. angustifolia* (=*C. montigena, C. martinii* var. *ewanii*) Heckard's paintbrush	Perennial herb; conifer forest; San Bernardino Mountains endemic (treated as a species by CNPS but considered a hybrid by Chuang & Heckard in Jepson Manual)	March - July	Fed: none Calif: S3.3 CNPS List 4.3	Occurs (Jeffrey pine forest)
Dryopteris filix-mas Male fern	Perennial herb; widespread in N hemisphere, esp. at high latitudes; only two reports in Calif., incl. Holcomb Valley	July - Sept.	Fed: none Calif: S 1.3 CNPS List 2.3	Low (local rarity)
Dudleya abramsii ssp. *affinis* San Bernardino Mts. dudleya	Perennial herb, pebble plains & rock outcrops (often carbonate); pinyon woodland, open pine forests, about 5200-8500 ft. elev.; San Bernardino Mtns endemic	April - June	Fed: none Calif: S 2.2 CNPS: List 1B.2	Moderate (marginal habitat)
Eriogonum foliosum (*E. evanidum*) Leafy buckwheat	Annual; sandy soil, woodlands or shrublands; about 3900-7200 ft. elev.; scattered locations, Big Bear Valley to N Baja Calif.; may be extinct in Calif.	July - Oct.	Fed: none Calif: SH CNPS List 1B.2	Minimal (presumed extinct, local rarity)
Eriogonum kennedyi var. *austromontanum* Southern mountain buckwheat	Matting woody perennial; pebble plains and similar soils, about 5800 - 7800 ft. elev.; nearly endemic to Big Bear area, also reported at Mt. Pinos	July - August	Fed: **THR** Calif: S2.2 CNPS: List 1B.2	Apparent introgression w/ Wright's buckwheat (see text)
Eriogonum microthecum var. *lacus-ursi* Bear Lake buckwheat	Subshrub; montane forests and shrublands; only known occurrence at Big Bear Lake shore ca. 7200 ft. elev.	July - Sept	Fed: none Calif: S 1 CNPS List 1B.1	Minimal (field survey)
Eriophyllum lanatum var. *obovatum* Southern Sierra woolly sunflower	Perennial herb; open montane coniferous forests, 4200-8200 ft. elev.; S Sierra Nevada and western San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Galium jepsonii (*G. angustifolium* var. *subglabrum*) Jepson's bedstraw	Perennial herb; sandy or gravelly soils, montane conifer forest, 6500-8100 ft. elev.; San Gabriel and San Bernardino Mtns	July - August	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Galium johnstonii (*G. angustifolium* var. *pinetorum*) Johnston's bedstraw	Perennial herb, dry slopes, chaparral, lower montane forest, pinyon and juniper woodland; about 4000-7600 ft. elev.; San Bernardino, San Gabriel, maybe San Jacinto mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Low-moderate (suitable habitat occurs; margin of elev. range)
Gilia leptantha ssp. *leptantha* San Bernardino Mtn. gilia	Annual; sandy or gravelly soils, open pine forest; endemic to upper Santa Ana Riv. watershed, San Bernardino Mtns., about 5000 to 7700 ft. elev.	June - Aug	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (probably outside geogr. range)
Heuchera hirsutissima Shaggy-haired alum root *Heuchera parishii* Parish's alumroot	Perennial herbs; rocky outcrops, cliffs, slopes; montane forest or alpine boulderfields; above about 4800 ft. elev.; *H. hirsutissima* is endemic to San Jacinto and Santa Rosa Mtns (unconfirmed from San Bernardino Mtns); *H. parishii* endemic to San Bernardino Mtns	May - July	Fed: none Calif: S2.3 CNPS: List 1B.3	Low (poorly suitable habitat)
Hulsea vestita ssp. *parryi* Parry's sunflower	Perennial herb; gen. conifer forests, on loose eroding soil and talus; San Bernardino Mtns and Little San Bern. Mtns; about 5500-9500 ft. elev.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	Low-moderate (marginal habitat)
Ivesia argyrocoma Silver-haired ivesia	Perennial herb; pebble plains, seasonal meadows, drainages; about 4900-8800 ft. elev.; San Bernardino Mtns and a long-disjunct site in Baja Calif mtns	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Occurs (field survey & NDDB record)
Juncus duranii Duran's rush	Perennial herb; meadows, seeps, etc., montane forest, about 5800-9000 ft. elev.; San Bernardino, San Gabriel, and San Jacinto Mtns	July - August	Fed: none USFS: none Calif: S 3.3 CNPS: List 4.3	Low (masrginal habitat occurs)
Lewisia brachycalyx Short-sepaled lewisia	Perennial herb; wet meadows, mesic forest openings, about 4500-7600 ft. elev.; San Bernardino Mtns to Baja Calif, Utah, New Mexico	May - June	Fed: none Calif: S3.2 CNPS: List 2.2	Low-Moderate (marginal habitat)
Lilium parryi Lemon lily	Bulb; meadows and streambanks, about 4200 - 8600 ft. elev.; mtns of S Calif. and SE Arizona	July - August	Fed: none Calif: S2.1 CNPS: List 1B.2	Low (marginal habitat)
Linanthus killipii Baldwin Lake linanthus	Annual; pebble plains, alkaline meadows, forest openings, about 5500-7900 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.1 CNPS: List 1B.2	High (suitable habitat occurs)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Mimulus exiguus San Bernardino Mountain monkeyflower	Annual; open, seasonally moist meadows, seeps, drainages, about 5900 - 7600 ft. elev.; San Bernardino Mtns. and high mtns of Baja Calif.	June - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Mimulus purpureus Purple monkeyflower	Annual; meadow edges, forests, drainages, seeps, about 6200 - 7600 ft. elev.; San Bernardino Mtns and high mtns of Baja Calif.	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Navarretia peninsularis Baja navarretia	Annual herb; open, seasonally wet places in coniferous forests, about 4900 -7600 ft. elev.; mtns of central and S Calif. and N Baja Calif.	June - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low (small patches of marginal habitat)
Oxytheca caryophylloides Chickweed oxytheca	Annual; sandy soils in conifer forests, 3900-8500 ft. elev.; S Sierra Nevada, Transverse Ranges, San Jacinto Mtns	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Perideridia parishii ssp. *parishii* Parish's yampah	Perennial herb; meadows, moist areas in conifer forest, about 4800 - 9900 ft. elev.; San Bernardino Mtns and (disjunct) AZ, Nevada, New Mexico	June - August	Fed: none Calif: S2.2? CNPS: List 2.2	Low - moderate (marginal habitat)
Phacelia exilis (*P. mohavensis* var. *exilis*) Transverse Range phacelia	Annual; sandy or gravelly soils, forest openings, meadows, pebble plains, about 3600 - 8900 ft. elev.; S Sierra Nevada and Transverse Ranges	May - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Phacelia mohavensis Mojave phacelia	Annual; sandy or gravelly soil; dry meadows and streambeds gen. within pine forest, about 4500-8100 ft. elev.; San Gabriel & San Bernardino Mtns.	April - August	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Phlox dolichantha Bear Valley phlox	Perennial herb; montane forest and pebble plains; about 6000 - 9800 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	High (suitable habitat occurs)
Poa atropurpurea San Bernardino bluegrass	Open, flat meadows, about 6700 - 7500 ft. elev. in the San Bernardinos; endemic to San Bernardino Mtns and San Diego Co. (Palomar and Laguna Mtns where it ranges down to about 4400 ft. elev.)	May - June	Fed: **END** Calif: S2.2 CNPS: List 1B.2	Low (habitat marginal at best)
Potentilla glandulosa ssp. *ewanii* Ewan's cinquefoil	Perennial herb; mesic conifer forest, about 6200-7900 ft. elev.; nearly endemic to San Gabriel Mtns., but also reported from Fawnskin area, San Bernardino Mtns.	June - July	Fed: none Calif: S 1.3 CNPS List 1B.3	Low (field survey)
Pyrrocoma uniflora ssp. *gossypina* (*Haplopappus uniflorus* ssp. *gossypinus*) Bear Valley pyrrocoma	Perennial herb; meadows (usually alkaline), pebble plains, about 5200 - 7600 ft. elev.; San Bernardino Mts endemic	July - August	Fed: none Calif: S2.2 CNPS: List 1B.2	Low - moderate (marginally suitable habitat occurs)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Rupertia rigida (*Psoralea rigida*) Parish's rupertia	Perennial herb; chaparral, forests, and woodlands, about 2300-8200 ft. elev.; San Bernardino Mtns, Peninsular Ranges, Baja Calif.	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Selaginella asprella Bluish spike-moss	Herb; rocks, crevices, & rocky soils, dry sites in conifer forests, about 5200-8800 ft. elev.; scattered mtn. ranges of cent. & S Calif., Baja Calif.	July	Fed: none Calif: S3.3 CNPS: List 4.3	Low (marginal habitat)
Senecio bernardinus (*Packera bernardinoa*) San Bernardino butterweed	Perennial herb; dry meadows (incl. alkaline), about 5900-7600 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: none Calif: S 2.2 CNPS: List 1B.2	Low (marginally suitable habitat)
Senecio ionophyllus Tehachapi ragwort	Perennial herb; crevices, rocky places in dry conifer forest, about 4800-8900 ft. elev.; S Sierra Nevada, San Gabriel and San Bernardino Mtns	June - July	Fed: none Calif: S3.3 CNPS: List 4.3	Moderate (suitable habitat)
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	Perennial herb; chaparral, oak shrubland or woodland, pine forest; San Bernardino Mtns. and a few Santa Barbara Co. sites, about 3200 - 6000 ft. elev.	June - August	Fed: none CA: **Rare** S 1.2 CNPS: List 1B.2	Minimal (marginal habitat, above elev. range)
Sidalcea pedata Bird's foot checkerbloom	Perennial herb; meadows (freshwater or alkaline clay), sometimes streambanks, about 5200-8200 ft. elev.; San Bernardino Mtns endemic	May - July	Fed: **END** Calif: **END**, 1.1 CNPS: List 1B.1	Low (habitat marginal at best)
Sphenopholis obtusata Prairie wedge grass	Perennial grass; riparian woodlands, meadows, streambanks; about 1000 - 6600 ft. elev.; few scattered locns in Calif. but widespread in N America	April - July	Fed: none Calif: S2.2 CNPS: List 2.2	Low (upper margin elev. range; poor habitat)
Streptanthus bernardinus Laguna Mountains jewelflower	Perennial herb; chaparral, hardwood & conifer forest, about 3900-8100 ft. elev.; mtns of S Calif. (gen. W half of San Bernardino Mtns)	June - July	Fed: none Calif: S 3.3 CNPS: List 4.3	Moderate (margin of geogr. range)
Streptanthus campestris Southern jewelflower	Perennial herb; shrublands, forests, woodlands, often rocky sites, about 2900 -7600 ft. elev.; Transverse and Peninsular Ranges, Baja Calif.	May - July	Fed: none Calif: S 2.3 CNPS: List 1B.3	High (suitable habitat occurs)
Swertia neglecta (*Frasera neglecta*) Pine green-gentian	Perennial herb; conifer forests and pinyon woodland., about 4600-8200 ft. elev.; S Coastal Ranges and Transverse Ranges	May - July	Fed: none Calif: S 3.3 CNPS: List 4.3	High (suitable habitat occurs)
Taraxacum californicum California dandelion	Perennial herb; wet meadows, about 5300 - 9200 ft. elev.; San Bernardino Mtns endemic	May - Aug	Fed: **END** Calif: S2.1 CNPS: List 1B.2	Low - moderate (suitable habitat occurs)

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

Special Status Plants	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
Thelypodium stenopetalum Slender-petaled thelypodium	Perennial herb; meadows (mesic, usually alkaline clay), about 5200 - 8200 ft. elev.; endemic to Big Bear and Holcomb Valleys	May - Aug	Fed: **END** Calif: **END**, 1.1 CNPS: List 1B.1	Minimal (no alkaline meadow habitat)
Trichostema micranthum Small-flowered bluecurls	Annual; dry margins of lakes, meadows, and streams, 5000-7600 ft. elev., San Bernardino Mtns and Baja Calif.	July - Sept.	Fed: none Calif: S3.3 CNPS: List 4.3	High (suitable habitat occurs)
Viola pinetorum ssp. *grisea* Grey-leaved violet	Perennial herb; montane forests, about 4900 -11,200 ft. elev.; S Sierra Nevada and reported San Bernardino Mtns (CNPS but no other source)	April - July	Fed: none Calif: S 1.3 CNPS: List 1B.3	Low (suitable habitat occurs; may be outside geogr. range)

General references: CDFG 2007a, 2007b; CNPS 2007; Hickman (ed.) 1993; Munz 1974; Sanders et al. 1995; Tibor 2001, US Fish and Wildlife Service 2006.

Conservation Status

Federal designations: (federal Endangered Species Act, US Fish and Wildlife Service). Until 1996, FWS maintained a list of "category 2 candidates," described as species of concern, but with insufficient data to support listing. This list is no longer maintained and FWS has no "SOC" category.

END: Federally listed, endangered.
THR: Federally listed, threatened.
Candidate: Sufficient data are available to support federal listing, but not yet listed.
Proposed: Formally proposed for federal status shown.

***State designations*:** (California Endangered Species Act, California Dept. of Fish and Game)

END: State listed, endangered.
THR: State listed, threatened.
RARE: State listed as rare (applied only to certain plants).
CSC: California species of special concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.
FP: Fully protected. May not be taken or possessed without permit from CDFG.

CDF&G Natural Diversity Data Base Designations: Applied to special status plants and sensitive plant communities; where correct category is uncertain, CDF&G uses two categories or question marks.

S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.
S1.1: Very threatened
S1.2: Threatened
S1.3: No current threats known
S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above).
S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimal suffixes same as above).
S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.
S5: Demonstrably secure or ineradicable in California. No threat rank.
SH: All California occurrences "historical" (i.e., no records in > 20 years).

APPENDIX 2: Special status plants of the Big Bear Valley and surrounding mountains.

California Native Plant Society (CNPS) designations. Note: According to CNPS (Tibor, ed., 2001 p. 54-55), plants on Lists 1A, 1B, and 2 meet definitions as threatened or endangered and "are eligible" for state listing. That interpretation of the state Endangered Species Act is not in general use.

List 1A: Plants presumed extinct in California.
List lB: Plants rare and endangered in California and throughout their range.
List 2: Plants rare, threatened or endangered in California but more common elsewhere in their range.
List 3: Plants about which we need more information; a review list.
List 4: Plants of limited distribution; a watch list.

CNPS Threat Rank:

.1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20-80% occurrences threatened)
.3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

Watch Lists: Several public and private conservation organizations maintain lists of wildlife species of concern. See CDFG 2007 introductory section for further explanations and references.
ABC: American Bird Conservancy Green List
Audubon: National Audubon Society Watch List
IUCN: World Conservation Union Species Survival Commission Red List

Definitions of occurrence probability: Estimated occurrence probabilities based literature sources cited earlier and field surveys and habitat analyses reported here.

Occurs: Observed on the site by qualified biologists.
Expected: Not observed or recorded on the site, but very likely present during at least a portion of the year.
High: Habitat is a type often utilized by the species and the site is within the known range of the species.
Moderate: Site is within the known range of the species and habitat on the site is a type occasionally used.
Low: Site is within the species' known range but habitat is rarely used, or the species was not found during focused surveys covering less than 100% of potential habitat or completed in marginal seasons.
Minimal: No suitable habitat on the site; or well outside the species' known elevational or geographic ranges; or a focused study covering 100% of all suitable habitat, completed during the appropriate season and during a year of appropriate rainfall, did not detect the species.
Unknown: No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

Appendix 3:
Species List

Appendix 3: Species list

Latin Name	**Common Name**		
CUPRESSACEAE	CYPRESS FAMILY		
Calocedrus decurrens	Incense cedar	Occas. / forest	
Juniperus occidentalis	Western juniper	Comm. / forest	
PINACEAE	PINE FAMILY		
Abies concolor	White fir	Occas. / forest	
Pinus jeffreyi	Jeffrey pine	Comm. / forest	
Pinus monophylla	Pinyon pine	Occas. /forest	
APIACEAE	CELERY FAMILY		
Lomatium nevadense	Nevada lomatium	Uncomm. / forest	11669
Tauschia parishii	Parish tauschia	Scarce / open places	11668
ASTERACEAE	ASTER FAMILY		
Achillia millefolium	California yarrow	Comm. / esp. mesic sites	
Agoseris retrorsa	Spear-leaved agoseris	Occas. / throughout	
Antennaria dimorpha	Low everlasting	Comm. / pebble plains	
Artemisia dracunculus	Tarragon	Occas. / esp. near road, lakeshore	
Artemisia ludoviciana	Western mugwort	Occas. / open places, washes	
Artemisia tridentata	Great Basin sagebrush	Comm. / open forest	
Aster frondosus	Short-rayed alkali aster	Occas.-comm. / near shore	
Chrysothamnus nauseosus	Common rabbitbrush	Occas. / throughout	
Chrysothamnus viscidiflorus	Curlleaf rabbitbrush	Occas.-comm. / throughout	
Cirsium occidentale var. californicum	California thistle	Uncomm. / open sites	
* *Cirsium vulgare*	Bull thistle	Occas. / near shore	
Erigeron breweri	Brewer's daisy	Occas. / forest	
Erigeron divergens	Diffuse daisy	Comm. / gen. open places	11667
Eriophyllum confertiflorum	Golden yarrow	Comm. / ± throughout	
Gnaphalium canescens	Perennial cudweed	Uncomm. / gen. open places	
* *Gnaphalium luteo-album*	Pearly everlasting	Occas. / roadside, shoreline	
Hymenopappus filifolius	Columbia cutleaf	Uncomm. / open forest	
* *Lactuca serriola*	Prickly lettuce	Occas. / mostly roadside	
Lessingia filaginifolia (Corethrogyne filaginifolia)	Chaparral aster	Occas. / open forest	
Madia elegans	Elegant tarplant	Occas. / forest	
* *Senecio vulgaris*	Common groundsel	Uncomm. / gen. roadside	
Solidago californica	Calif. goldenrod	Occas. / mesic sites	
* *Sonchus oleraceus*	Common sow thistle	Occas. / near shore	
* *Taraxacum officinale*	Common dandelion	Occas. / roadside, shoreline	
Tetradymia comosa	Hairy horsebrush	Occas. / open forest	
* *Tragopogon dubius*	Oyster plant, salsify	Occas. / roadside, forest	
BORAGINACEAE	BORAGE FAMILY		
Cryptantha micrantha	Purple root cryptantha	Occas. / open places	
Cryptantha simulans	Popcorn flower	Scarce / open places	11670
BRASSICACEAE	MUSTARD FAMILY		
Arabis holboellii (?)	Holboell's rock-cress	Occas. / open forest	
** *Arabis parishii*	Parish's rock-cress	Occas. / pebble plains	11665
Caulanthus major	Slender wild-cabbage	Occas. / forest	
Descurainia incisa (D. richardsonii)	Mountain tansy mustard	Uncomm. / near road	

Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season. Plants were identified using keys, descriptions, and illustrations in Abrams (1923-1951), Hickman (1993), Munz (1974), and other regional references. Taxonomy and nomenclature generally follow Hickman. Some plants were collected as vouchers (see collection numbers at right) and will be donated to the Herbaria at Rancho Santa Ana Botanic Garden or UC Riverside.

Appendix 3: Species list

BRASSICACEAE, cont.			
Descurainia pinnata	Tansy mustard	Occas. / mostly open forest	
Erysiumum capitatum	Douglas wallflower	Occas. / ±throughout	
* *Lepidium virginicum v. pubescens*	Wild peppergrass	Occas. / mostly roadside, shoreline	
* *Sisymbrium altissimum*	Tumble mustard	Occas. / roadside	
CACTACEAE	CACTUS FAMILY		
Opuntia basilaris var. basilaris	Common beavertail cactus	Uncomm. / open forest	
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY		
Symphoricarpos rotundifolius var. parishii	Parish snowberry	Occas. / shaded forest	
CARYOPHYLLACEAE	CARNATION FAMILY		
Silene verecunda ssp. platyota	Cuyamaca campion	Occas. / forest	
CHENOPODIACEAE	GOOSEFOOT FAMILY		
* *Chenopodium album (?)*	Common goosefoot	Occas. / throughout	
* *Salsola tragus*	Russian thistle, tumbleweed	Occas. / mostly roadside	
CONVOLVULACEAE	MORNING GLORY FAMILY		
Calystegia malacophylla ssp. fulcrata (C. fulcrata)	Morning glory	Occas. / throughout	
ERICACEAE	MANZANITA FAMILY		
Arctostaphylos patula	Greenleaf manzanita	Occas.-comm. / forest	
EUPHORBIACEAE	SPURGE FAMILY		
Chamaesyce albomarginata	Rattlesnake spurge	Occas. / open forest	
Euphorbia palmeri	Wood spurge	Occas. / uplands	
FABACEAE	PEA FAMILY		
Amorpha californica	Calif. false indigo	Occas. / mesic forest	
** *Astragalus leucolobus*	Bear Valley woollypod	Comm. / pebble plains	11705
Astragalus douglasii	Douglas rattleweed	Uncomm. / open places	
Lotus argyraeus	Silver lotus	Occas. / open forest	
Lotus nevadensis	Nevada lotus	Comm. / open places	
Lupinus cf. breweri	Silver mat lupine	Comm. / pebble plains, etc.	
Lupinus excubitus var. austromontanus	Southern mountain lupine	Occas. / ±throughout	11666
Lupinus lepidus v. confertus	Prairie lupine	Occas. / lakeshore	
* *Medicago lupulina*	Black medick	Uncomm. / near lakeshore	
* *Melilotus alba*	White sweet-clover	Occas.-comm. / roadsides, shore	
FAGACEAE	OAK FAMILY		
Quercus kelloggii	California black oak	Comm. / forest	
GERANIACEAE	GERANIUM FAMILY		
* *Erodium cicutarium*	Red-stemmed filaree	Occas.-comm. / roadsides, etc.	
HYDROPHYLLACEAE	WATERLEAF FAMILY		
Eridictyon trichocalyx	Yerba santa	Occas. / open forest	
Phacelia distans (?)	Common phacelia	Uncomm. / open forest	
Phacelia imbricata	Broad-sepaled phacelia	Uncomm. / open forest	
LAMIACEAE	MINT FAMILY		
Monardella linoides (?) (or M. odoratissima)	Flax-leaved monardella	Occas. / forest	
Scutellaria siphocampyloides (S. austinae)	Austin's skullcap	Uncomm. / mesic forest	
LOASACEAE	STICK-LEAF FAMILY		
Mentzelia sp.	Unid. stick-leaf	Uncomm. / uplands	11674
MALVACEAE	MALLOW FAMILY		
* *Malva parviflora*	Cheeseweed	Occas. / mostly lakeshore	
ONAGRACEAE	EVENING PRIMROSE FAMILY		
Clarkia sp.	Unid. annual clarkia	Uncomm. / shaded forest	

Appendix 3: Species list

ONAGRACEAE (cont.)			
Epilobium brachycarpum (E. paniculatum)	Summer cottonweed	Occas.-comm. upland margins	
Epilobium ciliatum	Willow-herb	Occas. / mostly lakeshore	
Gaypohytum sp.	Unid. gayophytum	Comm. / open forest	
POLEMONIACEAE	PHLOX FAMILY		
Gilia latiflora (?)	Broad-flowered gilia	Uncomm. / open forest	
Gilia modocensis	Modoc gilia	Occas. /open places	11,659
Eriastrum densifolium ssp. densifolium	Mojave woolly-star	Occas. / open forest	
Eriastrum sapphirinum	Sapphire woollystar	Occas. / open forest	
Linanthus breviculus	Mojave linanthus	Comm. / open forest	
Phlox gracilis	Slender phlox	Comm. / open places	11660
POLYGONACEAE	BUCKWHEAT FAMILY		
Eriogonum davidsonii (=E. molestum var. davidsonii)	Davidson buckwheat	Occas. / open forest	
** *Eriogonum kennedyi var. austromontanum*	Southern mountain buckwheat	Uncomm., pebble plain, intergrade w/ E. wrightii?	11760
Eriogonum wrightii ssp. subscaposum	Wright's buckwheat	Comm. & characteristic / pebble plains	
Eriogonum umbellatum v. munzii	Munz sulfur buckwheat	Occas. / open forest	
* *Polygonum arenastrum*	Common knotweed	Occas. / roadside, lake shore	
* *Rumex crispus*	Curly dock	Occas. / mostly lakeshore	
Rumex salicifolius	Willow dock	Uncomm. / near lakeshore	
PORTULACACEAE	PURSLANE FAMILY		
Lewisia rediviva	Bitter root	Occas.-comm. / pebble plains	
RANUNCULACEAE	BUTTERCUP FAMILY		
Delphinium parishii (?)	Parish larkspur	Occas. / forest	
* *Ranunculus sceleratus*	Cursed buttercup	Occas. / lakeshore	11656
RHAMNACEAE	BUCKTHORN FAMILY		
Ceanothus cordulatus	Mountain whitethorn	Occas. / open forest	
Ceanothus greggii	Cupleaf ceanothus	Uncomm. / open forest	
Ceanothus integerrimus	Deerbrush	Occas. / forest	
ROSACEAE	ROSE FAMILY		
Amelanchier utahensis	Service berry	Comm. / ± throughout	
Cercocarpus betuloides	Birch-leaf mountain mahogan	Uncomm.	
Cercocarpus ledifolius	Curlleaf mountain mahogany	Comm. / ± throughout	
Horkelia rydbergii (H. bolanderi s. parryi)	Transverse range horkelia	Occas. / mostly near lake	
** *Ivesia argyrocoma*	Silver-haired ivesia	locally comm. / pebble pl.	11658
Potentilla anserina	Silverweed	Comm. / lakeshore	
Potentilla biennis	Biennial cinquefoil	Comm. / lakeshore	11671
Potentilla gracilis	Slender cinquefoil	Occas. / mesic places	
Potentilla wheeleri	Wheeler cinquefoil	Scarce / near lakeshore	11673
RUBIACEAE	COFFEE FAMILY		
* *Galium aparine*	Goose grass	Uncomm. / shaded forest	
Galium parishii	Parish bedstraw	Occas. / forest	
SALICACEAE	WILLOW FAMILY		
Populus balsamifera trichocarpa	Black cottonwood	Seedlings only / lakeshore	
Salix laevigata (?)	Red willow	Uncomm. / lakeshore	
Salix lasiolepis (?)	Arroyo willow	Comm. / lakeshore	
SCROPHULARIACEAE	SNAPDRAGON FAMILY		
** *Castilleja cinera*	Ash-gray paintbrush	Localized / pebble plains	11657
** *Castilleja montigena (C. applegatei ssp. martinii)*	Heckerd's paintbrush	Occas. / forest	

Appendix 3: Species list

SCROPHULARIACEAE, cont.			
Collinsis parviflora	Small-flowered blue-eyed Mar	Comm., patchy / peb. pl.	11661
Limosella acaulis	Mudwort	Comm.-abund. / wet lakeshoı	11655
Mimulus guttatus	Seep monkeyflower	Occas. / lakeshore	
Pedicularis semibarbata	Pine-woods lousewort	Occas. / forest	11664
Penstemon eatonii	Eaton firecracker	Occas. / forest	
* *Verbascum thapsus*	Common muellin	Occas. / throughout	
SOLANACEAE	NIGHTSHADE FAMILY		
Solanum xanti	Chaparral nightshade	Uncomm. / forest	
STERCULIACEAE	CACAO FAMILY		
Fremontodendron californicum	Flannel bush	Occas.-comm. / open forest	
TAMARICACEAE	TAMARISK FAMILY		
Tamarix ramosissima	Mediterranean tamarisk	Occas. / lakeshore	
URTICACEAE	NETTLE FAMILY		
Urtica dioica ssp. holosericea	Stinging nettle	Occas. / lakeshore	
VIOLACEAE	VIOLET FAMILY		
Viola douglasii	Douglas violet	Occas. / pebble plains	11663
Viola purpurea	Mountain violet	Occas. / throughout	11662
VISCACEAE	MISTLETOE FAMILY		
Arceuthobium campylopodum	Dwarf mistletoe	Uncomm. / on yellow pines	
CYPERACEAE	SEDGE FAMILY		
Carex athrostachya	Slender-beaked sedge	Occas. / near lake	
Carex sp.	Unid. sedge	Uncomm. / near lakeshore	11671
JUNCACEAE	RUSH FAMILY		
Juncus arcticus (incl. vars. balticus and mexicanus)	Wire-grass	Occas.-comm. / mesic areas	
LILIACEAE	LILY FAMILY		
Allium parryi	Parry's onion	Occas. / mostly pebble plains	
Calochortus kennedyi	Kennedy's mariposa lily	Uncomm. / open forest	
POACEAE	GRASS FAMILY		
Agrostis sp.	Unid. bentgrass	Occas. / lakeshore	
Alopecurus aequalis	Short-awn foxtail	Comm., patchy / near shore	
Bromus carinatus	California brome	Occas. / uplands, ±throughout	
Bromus orcuttianus (?)	Orcutt brome	Uncomm. / mesic forest	
* *Bromus tectorum*	Cheat grass	Comm. / ± throughout	
Elymus elymoides (Sitanion hystrix v. hystrix)	Bottlebrush squirreltail	Occas. / ±throughout	
Elymus glaucus	Blue wild-rye	Occas. / ± throughout	
Hordeum jubatum	Foxtail barley	Uncomm. / mostly near lake	
* *Koeleria macrantha*	Junegrass	Occas. / mesic forest, uplands	
Melica stricta	Nodding melic	Uncomm. patchy, uplands	
Muhlenbergia rigens	Deergrass	Occas. / throughout	
Poa fendleriana	Fendler bluegrass	Occas.-comm. / forest	
Poa secunda	Nodding bluegrass	Comm. / ± throughout	
* *Polypogon monspeliensis*	Rabbitfoot grass	Occas.-comm. / near shore	
Pucinellia nuttalliana	Alkali grass	Uncomm. / low-lying mesic site	
Stipa coronata ssp. depauperata (Achnatherum parishii)	Parish needlegrass	Occas. / mostly open forest	
Stipa lettermannii	Letterman's needlegrass	Occas. / forest	
Vulpia microstachys (Festuca microstachys, F. reflexa, F. pacifica, F. confusa)	Annual fescue	Uncomm. patchy / upland	

Attachment 1:
California Natural Diversity Data Base Query Results

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Portrait
USGS 7½' quads: Fawnskin, Big Bear City, Big Bear Lake, Butler Pk, Keller Peak, and Moonridge

Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 ***Accipiter cooperii*** Cooper's hawk	ABNKC12040			G5	S3	SC
2 ***Antennaria marginata*** white-margined everlasting	PDAST0H1G0			G4G5	S1.3	2.3
3 ***Arabis dispar*** pinyon rock cress	PDBRA060F0			G3	S2.3	2.3
4 ***Arabis parishii*** Parish's rock cress	PDBRA061C0			G2	S2.1	1B.2
5 ***Arabis shockleyi*** Shockley's rock cress	PDBRA061V0			G3	S2.2	2.2
6 ***Arenaria lanuginosa ssp. saxosa*** rock sandwort	PDCAR040E4			G5T5	S1.3	2.3
7 ***Arenaria ursina*** Big Bear Valley sandwort	PDCAR040R0	Threatened		G2	S2.1	1B.2
8 ***Astragalus albens*** Cushenbury milk-vetch	PDFAB0F0A0	Endangered		G1	S1.1	1B.1
9 ***Astragalus lentiginosus var. sierrae*** Big Bear Valley milk-vetch	PDFAB0FB9L			G5T1	S1?	1B.2
10 ***Astragalus leucolobus*** Big Bear Valley woollypod	PDFAB0F4T0			G2	S2.2	1B.2
11 ***Astragalus tricarinatus*** triple-ribbed milk-vetch	PDFAB0F920	Endangered		G1	S1.2	1B.2
12 ***Atriplex parishii*** Parish's brittlescale	PDCHE041D0			G1G2	S1.1	1B.1
13 ***Botrychium crenulatum*** scalloped moonwort	PPOPH010L0			G3	S2.2	2.2
14 ***Calochortus palmeri var. palmeri*** Palmer's mariposa lily	PMLIL0D122			G2T2	S2.1	1B.2
15 ***Calochortus plummerae*** Plummer's mariposa lily	PMLIL0D150			G3	S3.2	1B.2
16 ***Calochortus striatus*** alkali mariposa lily	PMLIL0D190			G2	S2.2	1B.2
17 ***Castilleja cinerea*** ash-gray Indian paintbrush	PDSCR0D0H0	Threatened		G2	S2.2	1B.2
18 ***Castilleja lasiorhyncha*** San Bernardino Mountains owl's-clover	PDSCR0D410			G2	S2.2	1B.2
19 ***Chaetodipus fallax pallidus*** pallid San Diego pocket mouse	AMAFD05032			G5T3	S3	SC
20 ***Charina trivirgata*** rosy boa	ARADA02010			G4G5	S3S4	
21 ***Charina umbratica*** southern rubber boa	ARADA01011		Threatened	G5T2T3	S2S3	
22 ***Corynorhinus townsendii*** Townsend's big-eared bat	AMACC08010			G4T3T4	S2S3	SC
23 ***Dryopteris filix-mas*** male fern	PPDRY0A0B0			G5	S1.3	2.3

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24	***Dudleya abramsii ssp. affinis*** San Bernardino Mountains dudleya	PDCRA04013			G3T2	S2.2	1B.2
25	***Empidonax traillii extimus*** southwestern willow flycatcher	ABPAE33043	Endangered	Endangered	G5T1T2	S1	
26	***Erigeron parishii*** Parish's daisy	PDAST3M310	Threatened		G2	S2.1	1B.1
27	***Eriogonum kennedyi var. austromontanum*** southern mountain buckwheat	PDPGN083B2	Threatened		G4T2	S2.2	1B.2
28	***Eriogonum microthecum var. lacus-ursi*** Bear Lake buckwheat	PDPGN083WF			G5T1	S1.1	1B.1
29	***Eriogonum ovalifolium var. vineum*** Cushenbury buckwheat	PDPGN084F8	Endangered		G5T1	S1.1	1B.1
30	***Euchloe hyantis andrewsi*** Andrew's marble butterfly	IILEPA5032			G3G4T1	S1	
31	***Gasterosteus aculeatus williamsoni*** unarmored threespine stickleback	AFCPA03011	Endangered	Endangered	G5T1	S1	
32	***Gentiana fremontii*** moss gentian	PDGEN060Y0			G4	S2.3	2.3
33	***Gila orcuttii*** arroyo chub	AFCJB13120			G2	S2	SC
34	***Gilia leptantha ssp. leptantha*** San Bernardino gilia	PDPLM040W1			G4T2	S2.3	1B.3
35	***Glaucomys sabrinus californicus*** San Bernardino flying squirrel	AMAFB09021			G5T2T3	S2S3	SC
36	***Haliaeetus leucocephalus*** bald eagle	ABNKC10010	Threatened	Endangered	G5	S2	
37	***Helianthus nuttallii ssp. parishii*** Los Angeles sunflower	PDAST4N102			G5TH	S1.1	1A
38	***Heuchera parishii*** Parish's alumroot	PDSAX0E0S0			G2	S2.3	1B.3
39	***Horkelia wilderae*** Barton Flats horkelia	PDROS0W0J0			G1	S1.1	1B.1
40	***Hydroporus simplex*** simple hydroporus diving beetle	IICOL55050			G1?	S1?	
41	***Icteria virens*** yellow-breasted chat	ABPBX24010			G5	S3	SC
42	***Ivesia argyrocoma*** silver-haired ivesia	PDROS0X020			G2	S2.2	1B.2
43	***Lampropeltis zonata (parvirubra)*** California mountain kingsnake (San Bernardino population)	ARADB19062			G4G5	S2?	SC
44	***Lesquerella kingii ssp. bernardina*** San Bernardino Mountains bladderpod	PDBRA1N0W1	Endangered		G5T1	S1.1	1B.1
45	***Lewisia brachycalyx*** short-sepaled lewisia	PDPOR04010			G4G5	S3.2	2.2
46	***Lilium parryi*** lemon lily	PMLIL1A0J0			G3	S2.1	1B.2

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
47	***Linanthus killipii*** Baldwin Lake linanthus	PDPLM090N0			G2	S2.1	1B.2
48	***Malaxis monophyllos ssp. brachypoda*** adder's-mouth	PMORC1R010			G4?T4	S1.1	2.1
49	***Mimulus exiguus*** San Bernardino Mountains monkeyflower	PDSCR1B140			G2	S2.2	1B.2
50	***Mimulus purpureus*** purple monkeyflower	PDSCR1B2B0			G2	S2.2	1B.2
51	***Myotis evotis*** long-eared myotis	AMACC01070			G5	S4?	
52	***Myotis thysanodes*** fringed myotis	AMACC01090			G4G5	S4	
53	***Myotis volans*** long-legged myotis	AMACC01110			G5	S4?	
54	***Navarretia peninsularis*** Baja navarretia	PDPLM0C0L0			G3?	S2.2	1B.2
55	***Neotamias speciosus speciosus*** Lodgepole chipmunk	AMAFB02172			G4T2T3	S2S3	
56	***Oxytheca parishii var. cienegensis*** Cienega Seca oxytheca	PDPGN0J042			G4?T1	S1.3	1B.3
57	***Oxytheca parishii var. goodmaniana*** Cushenbury oxytheca	PDPGN0J043	Endangered		G4?T1	S1.1	1B.1
58	***Pebble Plains***	CTT47000CA			G1	S1.1	
59	***Perideridia parishii ssp. parishii*** Parish's yampah	PDAPI1N0C2			G4T3T4	S2.2?	2.2
60	***Phlox dolichantha*** Big Bear Valley phlox	PDPLM0D0P0			G2	S2.2	1B.2
61	***Phrynosoma coronatum (blainvillii*** Coast (San Diego) horned lizard	ARACF12021			G4G5	S3S4	SC
62	***Piranga rubra*** summer tanager	ABPBX45030			G5	S2	SC
63	***Poa atropurpurea*** San Bernardino blue grass	PMPOA4Z0A0	Endangered		G2	S2.2	1B.2
64	***Poliomintha incana*** frosted mint	PDLAM1L020			G5	SH	1A
65	***Populus angustifolia*** narrow-leaved cottonwood	PDSAL01020			G5	S2S3	2.2
66	***Potentilla glandulosa ssp. ewanii*** Ewan's cinquefoil	PDROS1B0S3			G5T1	S1.3	1B.3
67	***Psychomastax deserticola*** desert monkey grasshopper	IIORT15010			G1G2	S1S2	
68	***Pyrrocoma uniflora var. gossypina*** Bear Valley pyrrocoma	PDASTDT0K1			G5T2	S2.2	1B.2
69	***Rana muscosa*** mountain yellow-legged frog	AAABH01140	Endangered		G2	S2	SC

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
70	***Saltugilia latimeri*** Latimer's woodland-gilia	PDPLM0H010			G2	S2.2	1B.2
71	***Senecio bernardinus*** San Bernardino ragwort	PDAST8H0E0			G2	S2.2	1B.2
72	***Sidalcea hickmanii ssp. parishii*** Parish's checkerbloom	PDMAL110A3	Candidate	Rare	G3T1	S1.2	1B.2
73	***Sidalcea pedata*** bird-foot checkerbloom	PDMAL110L0	Endangered	Endangered	G1	S1.1	1B.1
74	***Southern California Threespine Stickleback Stream***	CARE2320CA			G?	S?	
75	***Sphenopholis obtusata*** prairie wedge grass	PMPOA5T030			G5	S2.2	2.2
76	***Streptanthus campestris*** southern jewel-flower	PDBRA2G0B0			G2	S2.3	1B.3
77	***Symphyotrichum defoliatum*** San Bernardino aster	PDASTE80C0			G3	S3.2	1B.2
78	***Taraxacum californicum*** California dandelion	PDAST93050	Endangered		G2	S2.1	1B.2
79	***Thamnophis hammondii*** two-striped garter snake	ARADB36160			G3	S2	SC
80	***Thelypodium stenopetalum*** slender-petaled thelypodium	PDBRA2N0F0	Endangered	Endangered	G1	S1.1	1B.1

Attachment 2:
California Natural Diversity Data Base Forms

California Native Species Field Survey Form

Mail to:
Natural Diversity Database
California Dept. of Fish & Game
1416 Ninth Street, 12th Floor
Sacramento, CA 95814

For office use only

Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Arenaria ursina*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
		XX	Drought? Vehicle disturbance?	

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit* More ?	Fewer ?	Same ?
	XX	23			Also not seen in 2002, also a drought year	XX				xx

Collected?	no	*Coll. #,Museum/Herbarium:*
	xx	

Reporter:	Scott D. White
Address:	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* %	*fruiting* %

Animal Information

Age Structure:	*# of adults*	*# of juveniles*	*# of unknown*		
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: (*please attach map*)
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site.

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W
UTM Data *Zone* / *Datum* / *Source* / *Accuracy*		*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: (*plant communities, dominants, associates, substrates/soils, aspects/slope*)
Pebble plain surrounded by arid Jeffrey pine forest.
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	*Excellent*	*Good*	*Fair*	*Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[] *Keyed in a site reference:*	*Organism*			
[] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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For office use only

Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Arabis parishii*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Uncommon on pebble plains

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
	xx	32			Not seen in 2002			*More ?*	*Fewer ?*	*Same ?*
								xx		

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11665 / RSA

Reporter:	Scott D. White
Address:	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* xx %	*fruiting* %

Animal Information

Age Structure:	*# of adults*	*# of juveniles*	*# of unknown*		
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: *(please attach map)*
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W
UTM Data *Zone* / *Datum* / *Source* / *Accuracy*		*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: *(plant communities, dominants, associates, substrates/soils, aspects/slope)*
Pebble plain surrounded by arid Jeffrey pine forest.
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ?? | *Excellent* | *Good* | *Fair* | *Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[x] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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For office use only

Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Ivesia argyrocoma*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Common on pebble plains

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
	xx	24			Also noted in 02	xx		*More ?*	*Fewer ?*	*Same ?*
										xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11658 / RSA

Reporter:	Scott D. White
Address:	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* %	*fruiting* %

Animal Information

Age Structure:		# of adults	# of juveniles	# of unknown	
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: (*please attach map*)
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W

UTM Data	*Zone*	*Datum*	*Source*	*Accuracy*	*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: (*plant communities, dominants, associates, substrates/soils, aspects/slope*)
Pebble plain surrounded by arid Jeffrey pine forest.
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	*Excellent*	*Good*	*Fair*	*Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

California Native Species Field Survey Form

Mail to:
Natural Diversity Database
California Dept. of Fish & Game
1416 Ninth Street, 12th Floor
Sacramento, CA 95814

For office use only

Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Astragalus leucolobus*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Occasional to common on pebble plains

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
			xx		Also noted in 02	xx		*More ?*	*Fewer ?*	*Same ?*
										xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11705

Reporter:	Scott D. White
Address:	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* %	*fruiting* %

Animal Information

Age Structure:		*# of adults*	*# of juveniles*		*# of unknown*
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: (*please attach map*)
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W
UTM Data — *Zone* / *Datum* / *Source* / *Accuracy*		*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: (*plant communities, dominants, associates, substrates/soils, aspects/slope*)
Pebble plain surrounded by arid Jeffrey pine forest.
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	*Excellent*	*Good*	*Fair*	*Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[x] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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1416 Ninth Street, 12th Floor
Sacramento, CA 95814

For office use only

Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Castilleja cinerea*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Occasional on pebble plain and open forest, with Eriogonum wrightii subscaposum

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
	xx	24			Also noted in 02	xx		*More ?*	*Fewer ?*	*Same ?*
										xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	xx	11657 / RSA

Reporter:	Scott D. White
Address:	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* %	*fruiting* %

Animal Information

Age Structure:	# of adults	# of juveniles	# of unknown		
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: (*please attach map*)
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W
UTM Data *Zone* / *Datum* / *Source* / *Accuracy*		*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: (*plant communities, dominants, associates, substrates/soils, aspects/slope*)
Pebble plain surrounded by arid Jeffrey pine forest.
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	*Excellent*	*Good*	*Fair*	*Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[x] *Keyed in a site reference:*	*Organism*			
[x] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

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Sacramento, CA 95814

For office use only

Source Code		Quad Code	
Elm Code		Occ #	
Copy to		Map Index #	

Date of Field Work (*Month – Day – Year*) *April 30 2007*

Scientific Name : *Castilleja "montigena"*

Common Name :

Species Found?	Yes	No	*If not, why?*	*Total Number of Individuals:*
	xx			Occasional in forest

Is this an existing NDDB occurrence?	Yes	*Occurrence #*	No		**Is this a Subsequent Visit?**	Yes	No	*#s of individuals since last visit*		
			xx		Also seen in 02	xx		*More ?*	*Fewer ?*	*Same ?*
										xx

Collected?	Yes	*Coll. #,Museum/Herbarium:*
	No	

Reporter:	Scott D. White
Address:	Scott White Biological Consulting 201 North First Ave., No. 102 Upland, Calif. 91786
Phone: **E-mail:**	(909) 949-2686 / scottbioservices@earthlink.net

Plant Phenology Information

dormant %	*sterile* %	*senescent* %
budding %	*flowering* %	*fruiting* %

Animal Information

Age Structure:		*# of adults*	*# of juveniles*	*# of unknown*	
Wintering	*Foraging*	*Breeding*	*Roosting*	*Burrow site*	*Other*

Location: (*please attach map*)
San Bernardino Mtns., just north of Big Bear Lake near community of Fawnskin at former "Moon Camp" site

County:	**Quad Name:**	**Landowner:**	
San Bernardino Co.	Fawnskin	private	
Elevation:	*Township* / *Range* / *Section (s)*	*Latitude:*	*Longitude:*
6800-6900 ft	2N / 1W / 13 (N half)	Ca. 34°16' N	Ca. 116°56' W
UTM Data *Zone* / *Datum* / *Source* / *Accuracy*		*X coordinate (E)*	*Y coordinate (N)*

Habitat Description: (*plant communities, dominants, associates, substrates/soils, aspects/slope*)
Arid Jeffrey pine forest; generally in relatively shaded places
Other rare species? Arabis parishii, Astragalus leucolobus, Ivesia argyrocoma, Castilleja cinerea, "C. montigena,"

Site Information

Current/surrounding land use: Vacant, short distance S of residential development, short distance N of well-used highway
Visible Disturbances; possible threats: Significant vehicle damage to habitat; site proposed for development

Overall site quality: ??	*Excellent*	*Good*	*Fair*	*Poor*

Comments:

Determination method:	*Photographs:*	Slides	Prints	Digital
[] *Keyed in a site reference:*	*Organism*			
[] *Compared with other specimen*	*Habitat*			
[] *Compared with photo/sketch*	*Diagnostic Features*			
[x] *By knowledgeable individual*	*Other*			
[] *Other method:*	*Permission to duplicate*	yes []	no []	

A.9 - Supplemental Focused Rare Plant Survey (Tim Krantz, June 2008)

MOON CAMP TENTATIVE TRACT 16136

SUPPLEMENTAL FOCUSED RARE PLANT SURVEY

Prepared for:
Michael Brandman Associates
621 E. Carnegie Dr., Suite 100
San Bernardino, CA 92408

Prepared by:
Dr. Timothy P. Krantz
Timothy Krantz Environmental Consulting
(a division of Pangaea Nova LLC)
P.O. Box 33
Angelus Oaks, CA 92305

June 29, 2008

Project site location:	USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1 West, portion of Section 13.
Assessors Parcel Nos.:	0304-082-04 and 0304-091-12, 13 and 21
Owner /Applicant:	Tim Wood, P.O. Box 6820, Big Bear Lake, CA 92315
Principal Investigator:	Dr. Timothy P. Krantz, (909)748-8590

MOON CAMP TENTATIVE TRACT
SUPPLEMENTAL FOCUSED RARE PLANT SURVEY

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III. Focused Study—Species of Concern..... 3

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V. Rare, Endangered or Sensitive Species and Habitats 5

VI. Recommendations..... 8

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MAPS, APPENDICES, AND ATTACHMENTS

Figure 1: Regional Location Map (from EIR)

Figure 2: Project Map (from EIR)

Figure 3: Map of Pebble Plain and Ashy-gray Paintbrush Habitat

Table 1. Special Status Species Occuring On Site

Table 2. Special Status Species Determined to Not Occur On Site

MOON CAMP TENTATIVE TRACT 16136
SUPPLEMENTAL RARE PLANT SURVEY

I. EXECUTIVE SUMMARY

A focused rare plant survey of the Moon Camp Tentative Tract 16136 was completed for the property. This survey supplements a general botanical survey of the property conducted by Scott White Biological Consulting, dated August 2007 (White 2007, henceforth, "White survey"). The White survey positively identified one federally-listed plant species—ashy-gray Indian paintbrush (*Castilleja cinerea)*—and four special-status species: Parish's rock-cress (*Arabis parishii*), Big Bear Valley woollypod (*Astragalus* leucolobus), Heckard's paintbrush (*Castilleja montigena*) and silver-haired rattails (*Ivesia argyrocoma*) (Table 1).

This supplemental survey affirmed the presence of these species, and added two additional special-status species: purple monkeyflower (*Mimulus purpureus*) and Sugarloaf phlox (*Phlox dolichantha*); and disaffirmed presence of a list of other special-status and federally-listed plant species deemed to potentially occur on the property, according to White (Table 2).

The White survey had identified 13.81 acres of ashy-gray paintbrush habitat, distributed among four occurrences (Figure 1). This supplemental survey found the two easternmost occurrences to be erroneous. No ashy-gray Indian paintbrush plants occur at those two sites. In addition, the occupied habitat of the middle occurrence was found to cover less than one-third the estimated acreage reported by White, and the western occurrence exhibited a somewhat smaller occupied habitat footprint, but was deemed to generally conform to White's estimated acreage. Altogether, the occupied habitat of ashy-gray Indian paintbrush has been recalculated to approximately 7.71 acres.

II. PROJECT AND PROPERTY DESCRIPTION

The San Bernardino County Planning Department is reviewing an application for Moon Camp Tentative Tract 16136—a proposed 50-lot residential development on the former Moon Camp site in Fawnskin. The project site is on the north shore of Big Bear Lake, in the eastern part of the community of Fawnskin, in unincorporated San Bernardino County. The project site is comprised of about 62 acres, situated on both sides of State Highway 38, between Oriole Lane and Polique Canyon Road (on the Fawnskin USGS 7½' quadrangle map, in the north half of Section 13, Township 2N and Range 1W). The project site slopes from north to south. Elevation ranges from 6,960 feet in the northeastern portion of the site to 6,750 feet near the lakeshore (see Figures 1 and 2).

The project site occurs within an area that is described by the Open Space element of San Bernardino County's General Plan as, "This area includes the entire watershed area of Big Bear Lake, and contains a number of specialized habitat areas, which support a large number of endangered plants and animals (as well as commonly occurring mountain species). Habitat values

here should be maintained, potentially by controlling development to prevent damage to important habitat areas."

III. FOCUSED STUDY / SPECIES OF CONCERN

The White survey was conducted on three dates, April 30, June 7, and August 8, during the 2007 season. The 2007 precipitation season (measured from July 1 to June 30 annually) was a record drought year for the San Bernardino Mountains, with only 11.66 inches of precipitation recorded at Big Bear Dam, compared to an average annual precipitation of 36.00 inches. For this reason, White recommended that additional surveys be accomplished to determine presence or absence of four federally-listed endangered plant species known to occur in montane meadow habitats; and that a subsequent survey should be accomplished on site to determine presence or absence of three federally-listed species known to occur on pebble plain habitat. In addition, there are numerous other special-status plant species potentially occurring in the area , particularly annual species, that would not be identifiable during extreme drought years.

The 2008 precipitation year was average, with 35.29 inches through May this year, and flowering of both annual and perennial species exhibited good anthesis.

This report focuses on determining presence or absence of the following plant species:

Montane Meadow Species:

- San Bernardino bluegrass (*Poa atropurpurea*) (federally endangered);
- Bird-foot checkerbloom (*Sidalcea pedata*) (federal- and state-endangered);
- California dandelion (*Taraxacum californicum*) (federal-endangered); and
- Slender-petaled thelypodium (*Thelypodium stenopetalum*) (federal-endangered).

Pebble Plain Species:

- Bear Valley sandwort (*Arenaria ursina*) (federally threatened);
- Ash-gray Indian paintbrush (*Castilleja cinerea*) (federal-threatened); and
- Southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*) (federal-threatened).

IV. METHODOLOGY

California Department of Fish and Game field survey protocols were followed for each of the target federal-listed species considered to potentially occur on site (CDFG 2000). These protocols basically require that surveys are conducted following these guidelines: (1) conducted during flowering seasons for the special status plants known from the area, (b) were floristic in nature, (c) were consistent with conservation ethics, (d) systematically covered all habitat types on the site, and (e) are well documented by this report.

A walkover of the Moon Camp property was conducted on May 5, 12 and June 6, 2008. The May 5 and 12th surveys focused on the "meadow" habitat along the lakeshore of the Big Bear Lake reservoir; and on identification of any special-status early-blooming annual plant species. The June 6 survey focused on delineation of the ashy-gray Indian paintbrush occurrences; and on identification of late-blooming annuals and perennials.

May surveys for other projects elsewhere in Big Bear Valley (North Baldwin Lake, Pan Hot Springs, Sawmill/Sugarloaf pebble plains, Eagle Point) had indicated that all seven federal-listed species considered to potentially occur on site, according to the White survey, were observed and reliably identifiable at the time of the early May surveys; and the ashy-gray paintbrush and other potential pebble plain species were readily visible, with fully-mature inflorescences, at the time of the June survey.

Positive findings (only pebble plain-associated species, including ashy-gray paintbrush) were precisely located using a Garmin GPS; and GPS data was downloaded and displayed at the Redlands Institute GIS laboratory, and transferred to the EIR consultant, Michael Brandman Associates, to their Palm Springs office; and to the project engineer, Hicks and Hartwick Engineering, in Redlands.

The meadow habitat was carefully walked throughout its narrow distribution along the lakeshore, and any other vernal springs or areas of persistent surface soil moisture were closely examined for potential endangered meadow species; and for the presence of special-status vernal annual species, such as eye-strain monkey-flower (*Mimulus exiguus*) or yellow owl's-clover (*Castilleja lasiorhyncha*).

The White survey reported four ashy-gray paintbrush occurrences, and these were the focus of the June 6 field survey—to confirm those locations and obtain an accurate GPS delineation of the ashy-gray paintbrush distribution and pebble plain habitat on the property.

V. RARE, ENDANGERED OR SENSITIVE SPECIES AND HABITATS (RESULTS)

Endangered Meadow Species

Of the four federally-listed endangered meadow species (Section 3, above), none were identified on site; and they are not considered likely to occur on site. The lakeshore habitat is not indigenous meadow habitat, such as supports the endemic meadow flora elsewhere in Big Bear Valley (Krantz 1979, 1980, 1981a, et alus); rather, it is what this author calls "ruderal" reservoir habitat. Ruderal means, "growing where the natural vegetational cover has been disturbed by man." (Webster's 9th Collegiate Dictionary) In this case, the ruderal reservoir habitat is comprised of a mix of native and non-native, aquatic and semi-aquatic plant species, existing in the zone between the high water level of the reservoir and the draw-down area. Native meadow species sometime occur along the narrow margin just above the high water level, but in the case of the Moon Camp property, this is very limited to a strand of willows (*Salix scouleriana)* and a non-diverse assemblage of common wetland species, such as wiregrass (*Juncus balticus*), yarrow (*Achillea millefolium*) and silver-leaved cinquefoil (*Potentilla anserina*).

No endangered, threatened, or special-status meadow plant species were identified on the Moon Camp property, and the potential for any occurrence of such species is considered to be extremely low.

Pebble Plain Species

The White survey had previously mapped a known pebble plain occurrence on the western portion of the property. This pebble plain contains many of the characteristic species occurring on other pebble plains in Big Bear and Holcomb Valleys, but for the Kennedy's southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*), which is replaced by the closely-related taxon, Wright's matting buckwheat (*Eriogonum wrightii* var. *subscaposum*), and absence of Bear Valley sandwort (*Arenaria ursina*). Kennedy's southern mountain buckwheat and Bear Valley sandwort were used as indicator species of pebble plains by the author, during his original systematic surveys of this endemic plant community (Krantz 1981b, 1983). The lack of both indicator species on the Moon Camp property resulted in this area not being indicated as pebble plain habitat during those initial surveys. However, the area indicated as "pebble plain" within Open Space Lot A has many other species commonly associated with true pebble plain habitat, and has been mapped as such on Figure 3.

Ashy-gray paintbrush (*Castilleja cinerea*) had been mapped as four distinct occurrences by White, but the author, in conjunction with this survey, found that the two eastern occurrences, indicated as occurring behind (north of) Lots 22, and 29-30-31 of the adjacent existing residential tract, do not support any ashy-gray paintbrush plants. There were openings of Wright's matting buckwheat at these locations, with silver rat-tails (*Ivesia argyrocoma*), which is sometimes associated with pebble plains, and Heckard's paintbrush (*Castilleja montigena*) was found on the perimeter of the openings, but no ashy-gray paintbrush exists at those locations. To verify that the author was, indeed, at the proper locations, the areas considered to be concurrent with those areas indicated by White were delineated with GPS data points to confirm the negative findings.

Similarly, the GPS delineation of the middle ashy-gray paintbrush occurrence was found to be less than one-third the size of the occupied habitat indicated in the White survey (0.11-acre actual occupied habitat, consisting of approximately 50 plants). This occurrence corresponds to the

southernmost portions of proposed Lots 47 and 48, adjoining Highway 18. In this case, it appeared that White had mapped the Wright's matting buckwheat distribution, without regard to association with the ashy-gray paintbrush.

Another very small ashy-gray paintbrush occurrence was located at the rear of Lot 49, comprised of 0.01-acre, and consisting of 10 plants.

A single point, representing three ashy-gray paintbrush plants, was located at the vernal spring on the rear portion of Lot 50; and the easternmost portion of the primary pebble plain occurrence on Lot A extends into Lot 50 on its southwestern quarter, comprising about 0.11-acre of occupied habitat.

The primary pebble plain (the westernmost occurrence according to White) was found to be more restricted than indicated by White at the eastern portion of the occurrence on Lots 49 and 50, but generally conformed to the area indicated by White in the area of the central pebble plain (within the proposed rare plant preserve) and toward the western portion of the pebble plain and ashy-gray paintbrush area. The actual occupied habitat of ashy-gray paintbrush on Lots 1 through 5 was calculated to comprise 2.07 acres.

The most exemplary pebble plain habitat on the Moon Camp property was found to conform to the area indicated by White, and would be entirely included within the proposed 4.2 acre conservation easement area. Fencing of the highway frontage has stopped the unauthorized off highway vehicle use that was evidenced on the pebble plain habitat from years past.

To summarize the results of the survey of ashy-gray paintbrush occupied habitat, it is distributed among four occurrences: Lot 47—0.11 acre, Lot 49—0.01 acre, Lot 50—0.11 acre, and the pebble plain and more extensive western occurrence, comprising 4.91 acres within Lot A, 2.07 acres within Lots 1-5, and 0.5 acre within Road A, for a total of 7.7 acres of occupied ashy-gray paintbrush.

Other Special Status Species

Two new special status species were added to the project list: purple monkeyflower (*Mimulus purpureus*) and Sugarloaf phlox (*Phlox dolichantha*). Purple monkeyflower was found to be rather widely distributed on the pebble plain and extending down into the draw to the east, corresponding to the southern half of proposed Lot 50. This draw exhibited vernal spring habitat characteristics; that is, an association of very tiny, ephemeral annuals, such as moss juncus (*Juncus bryoides*), hispid popcorn flower (*Plagiobothrys hispidulus*) and other minute monkeyflower species, such as *Mimulus androsaceus* and *M. suksdorfii*. Most of the purple monkeyflower distribution is included within the proposed 4.2 acre conservation easement area.

Sugarloaf phlox was found to be rather widely distributed on the Moon Camp property in open black oak woodland and under Jeffrey pines. Although restricted to Big Bear and Holcomb Valleys, its regional distribution extends up to the summit of Sugarloaf Mountain south of Big Bear Valley, and as far north as White Mountain, northwest of Holcomb Valley; the taxon is fairly common within its range, and is not considered to be a high priority candidate for listing or more formal protection (Krantz 1983).

Table 1: Special Status Species Occurring on the Moon Camp Property

Arabis parishii	Parish's rock-cress	Fed.: none; S2.1; List 1B.2
Astragalus leucolobus	Bear Valley woollypod	Fed.: none; S2.2; List 1B.2
Castilleja cinerea	Ashy-gray Indian paintbrush	Fed.Threatened; S2.2; List 1B.21B, 2-2-3;
Castilleja applegateii Ssp. *martinii*	Mountain paintbrush	Fed: none; S3.3; List 4.3
Ivesia argyrocoma	Fuzzy rat-tails	Fed: none; S2.2; List 1B.2
Mimulus purpureus	Purple Monkeyflower	Fed: none; S2.2; List 1B.2
Phlox dolichantha	Sugarloaf phlox	Fed: none; S2.2; List 1B.2

Fed. (Federal Rank)
State Rank (S), California Natural Diversity Database
- **S1**: Fewer than six occurrences or fewer than 1000 individuals or less than 2000 acres
- **S1.1**: Very threatened
- **S1.2**: Threatened
- **S1.3**: No current threats known
- **S2**: 6-20 occurrences or 1000-3000 individuals or 2000-10000
- **S3**: 21-100 occurrences or 3000-10000 individuals or 10000-50000 acres
- **S4**: Apparently secure in California; this rank is clearly lower than S3, but factors exist to cause some concern, *i.e.*, there is some threat or somewhat narrow habitat. No threat rank.
- **S5**: Demonstrably secure or ineradicable in California. No threat rank.

Table 2: Threatened or Endangered Species Determined Not to Occur On Site

Federal Threatened—FT
Federal Endangered—FE

Arenaria ursina	Bear Valley sandwort	FT
Eriogonum kennedyi var. *austromontanum*	Southern mountain buckwheat	FT
Poa atropurpurea	San Bernardino bluegrass	FE
Sidalcea pedata	Bird-foot checkerbloom	FE
Taraxacum californicum	California dandelion	FE
Thelypodium stenopetalum	Slender-petaled thelypodium	FE

VI. RECOMMENDATIONS

A. Establishment of a Conservation Easement and Rare Plant Habitat Preserve

A 4.91-acre rare plant preserve is proposed to be established over the pebble plain habitat. As indicated on the Tentative Tract map, this preserve will protect the most exemplary and best quality of the pebble plain habitat on site, including all seven of the special status species observed on site. A detailed management plan for the preserve area shall be adopted and recorded with the conservation easement, specifying the terms and conditions for allowed and disallowed uses within the preserve area.

The conservation easement shall be conveyed to the San Bernardino Mountains Land Trust or other land stewardship entity, together with a management endowment to cover annual costs of maintenance (replacing signs, mending fences). Interpretive literature, signs, and trails shall be developed for homeowners and visitors to provide an understanding of the sensitive resources occurring in the preserve area.

B. Building Envelopes for Paintbrush Habitat

Construction to the rear portions of Lots 47, 48, 49 and 50 shall be restricted by means of building envelopes or building setback lines, to prevent construction in the occupied ashy-gray paintbrush habitat. The rear portions of these lots abut the Highway 38 frontage, in any case, and are thus largely within the Caltrans right of way and required rear lot setbacks. Lot 50 is constrained by a drainage easement along the eastern length of the parcel, by the Caltrans right-of-way along the highway, and by pebble plain resources.

C. Offsite Compensation for Paintbrush Habitat

Off-site compensation for direct and indirect impacts to ashy-gray Indian paintbrush and pebble plain habitat outside of the 4.91-acre Conservation Easement and not protected by building setbacks (2.57 acres) may be accomplished by acquisition and protection of similar or better habitat resources elsewhere in the valley.

There is a limited amount of privately-held ashy-gray paintbrush and pebble plain habitat available for off-site mitigation. One of the best remaining examples of pebble plain habitat in private ownership that may be used to off-set impacts on the Moon Camp property is the "Sugarloaf pebble plain", situated at the northern terminus of Dixie Lee Lane in the unincorporated community of Sugarloaf. This is a 10-acre, high-quality pebble plain. It was fenced and has been protected from off-highway vehicles since the mid-1980s as a mitigation for construction of the Big Bear High School, the intention being to set aside a 2-acre portion of the 10-acre parcel as mitigation for impacts to pebble plains resources for the High School site, and use the remaining eight acres for mitigation of other projects. The parcel was surveyed by Hicks & Hartwick, but was never formally recorded.

The proposal for off-site mitigation of direct and indirect impacts to ashy-gray paintbrush and pebble plains resources on the Moon Camp property is to acquire fee title interest of the entire Sugarloaf Pebble Plain parcel (less a proposed road easement to accommodate the County's

westerly extension of Baldwin Lane); record the parcel, and convey a Conservation Easement to a responsible stewardship entity, such as the San Bernardino Mountains Land Trust (SBMLT). The conveyance of the easement shall be accompanied by a habitat management and monitoring endowment to be deposited into an escrow account for that purpose. In addition to the initial deposit to establish the habitat management account, Homeowner's Association fees shall be collected annually to provide funding in the long-term. Management guidelines, terms and conditions of the conservation easement shall be clearly defined in a Habitat Management Plan, to be recorded with the easement. These management conditions shall include maintenance of fencing and signs, maintenance of the trail across the pebble plain, and development of interpretive materials for the pebble plains resources.

D. Onsite Management

Impacts to the pebble plains habitat and sensitive plants will be minimized by the project's design, which will place the pebble plain area, including ashy-gray Indian paintbrush habitat and all six special-status species, into a permanently protected Conservation Easement. The long-term conservation value of the proposed open space requires active onsite land management to prevent "edge effects" from existing and proposed adjacent land uses.

A habitat management plan (HMP) should be developed for the Conservation Easement area. The HMP shall address management of the rare plant preserve with respect to the following indirect impacts:

- Removal and control of invasive non-native plants;
- Trampling or soil damage caused by foot traffic, vehicles, bicycles, or other recreation;
- Alteration of surface hydrological conditions caused by irrigation on adjacent lots, road runoff, or water diversions installed for erosion control;
- Vegetation clearing, especially for fuel modification to reduce fire hazards to adjacent homes; and

The HMP shall be administered by the SBMLT or other land stewardship entity. Funding for implementation of habitat management measures shall be derived from interest earned from the habitat management endowment and from annual Homeowner's Association fees.

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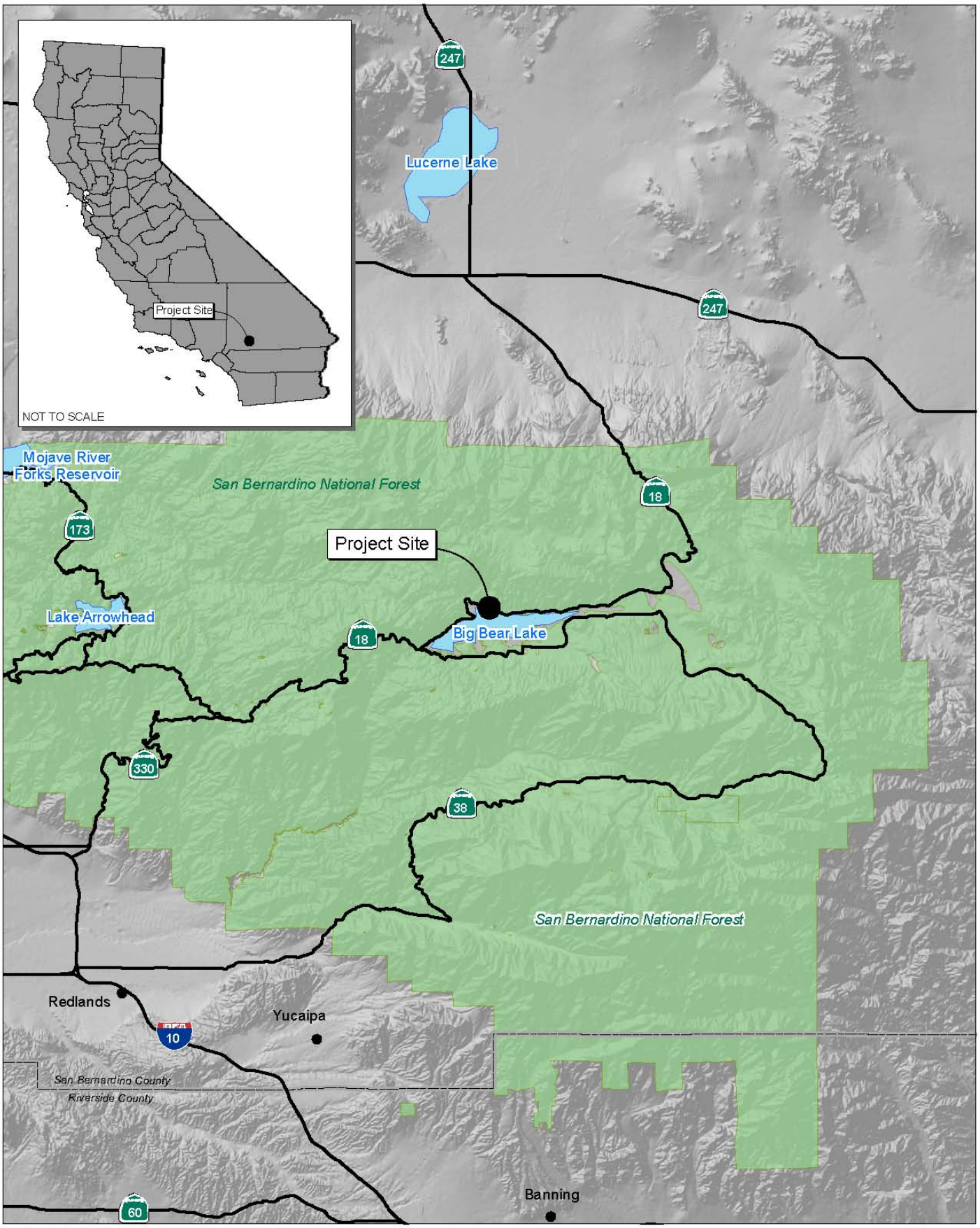
VIII. CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this supplemental rare plant survey, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me. I certify that I have not signed a nondisclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.

DATE: June 29, 2008 SIGNED: _____



Source: Census 2000 Data, The CaSIL, MBA GIS 2007.

NORTH

5 2.5 0 5 Miles

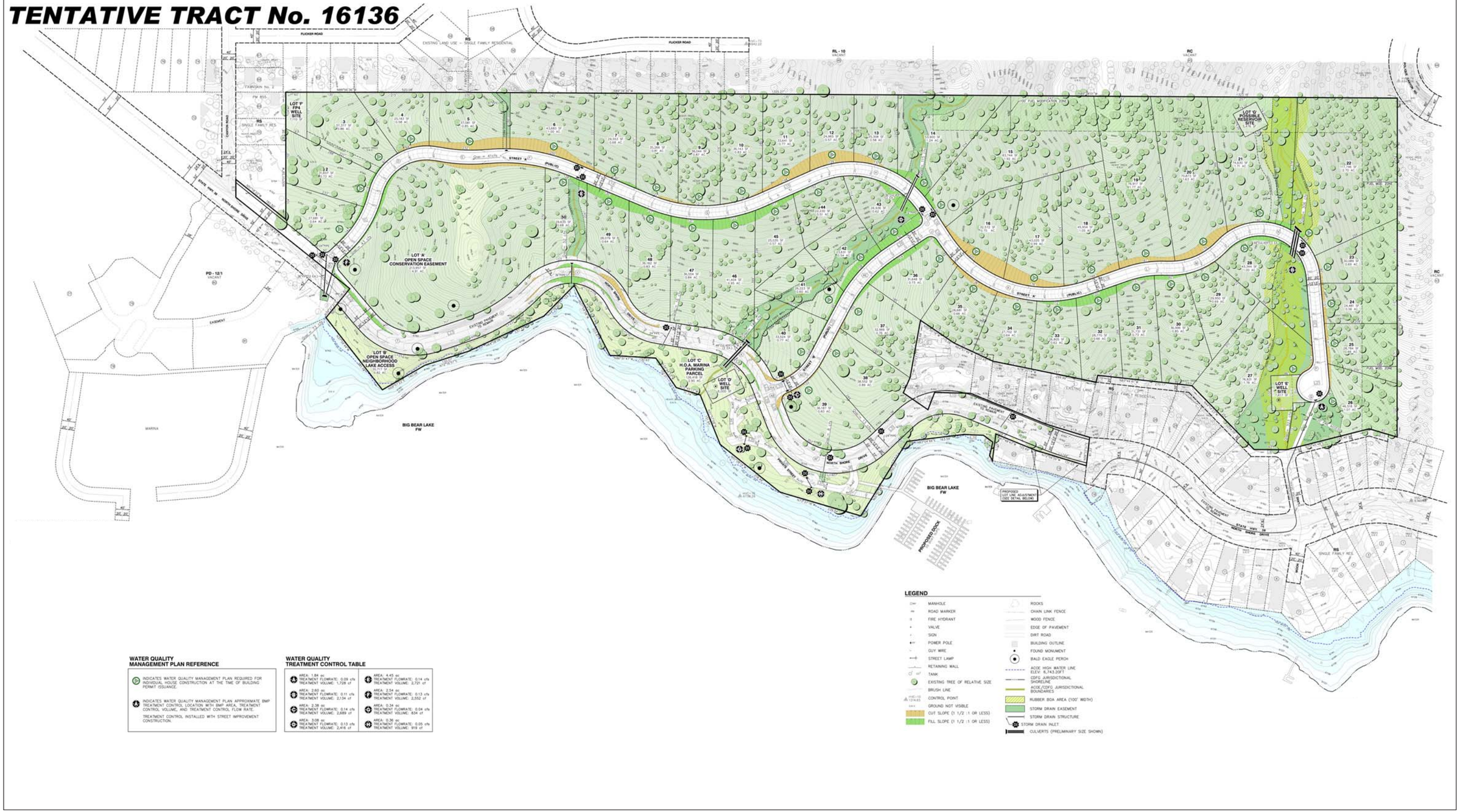
Michael Brandman Associates

Figure 1
Regional Location Map

00520089 • 07/2009 | 1_Krantz_regional.ai

MOON CAMP TENTATIVE TRACT 16136
FOCUSED RARE PLANT SURVEY

TENTATIVE TRACT No. 16136



Source: Hicks & Hartwick, Inc. (July, 2009).

NORTH

260 130 0 260 Feet

Michael Brandman Associates

00520089 • 07/2009 | 2_Krants_ttm16136.ai

Figure 2
Project Map

MOON CAMP TENTATIVE TRACT 16136
FOCUSED RARE PLANT SURVEY

Source: Hicks & Hartwick, Inc. (July, 2009) & Tim Krantz, Ph.D (July, 2009).

NORTH

260 130 0 260 Feet

Michael Brandman Associates

00520089 • 07/2009 | 3_Krants_Pebble_Plain.ai

Figure 3
Map of Pebble Plain and Ash-gray Paintbrush Habitat

MOON CAMP TENTATIVE TRACT 16136
FOCUSED RARE PLANT SURVEY

A.10 - Southern Rubber Boa Letter Report (Glen Stewart, February 2007)

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

Biological Sciences
College of Science

February 18, 2007

Mr. Michael Perry
California Collaborative Solutions
P. O. Box 706
Big Bear City, CA 92314

Dear Mr. Perry,

This letter reports my observations and evaluation of potential habitat for the Southern Rubber Boa (SRB, *Charina bottae umbratica*), a State of California Threatened Species, on two properties in the Big Bear Lake area on February 9, 2007. Accompanied by you, Lisa Kegarice, and Marni McKernan, I walked the 62 acre "Moon Camp Tract" in Fawnskin between about 11:20 AM and 12:20 PM. After lunch, you and I walked about half of the 160 acre "High Timber Ranch" tract in the Moonridge area, also driving to briefly view two other parts of the tract, between approximately 1:45 PM and 3:15 PM. Lisa and Marni accompanied us for a few minutes at the beginning of our walk there.

The Moon Camp Tract in Fawnskin is immediately adjacent to the north shore of Big Bear Lake and has a south-facing exposure at an elevation of about 6,800 feet. Roughly the western third of the tract is bounded by developed property while the eastern two thirds is bounded by Forest Service land on the north and, I believe, undeveloped private property on the east. The tract is quite dry, sloping unevenly upward to the north and east with a couple of shallow, dry ravines in the eastern portion. In the western portion, the vegetation is composed of an open stand of Jeffrey Pine, with a sparse understory of Great Basin Sagebrush and herbaceous plants. Here, there also is an open "pebble plain" habitat. The stands of pine become somewhat more dense in the eastern part of the tract with larger sagebrush shrubs. Throughout the tract, litter and duff are very thin, but there are a few moderately weathered, medium-sized logs scattered around. Significantly, there are no rock outcrops, which generally are used by SRBs for hibernation sites.

My assessment of the Moon Camp Tract is that it is poor SRB habitat. Further, it is outside of the area mapped as potential SRB habitat in the 1985 Forest Service habitat management guide for the SRB, and there have been no sightings of SRBs reported in the area. My recommendations for mitigating development of the tract are that trees and downed logs be allowed to remain in place, to the extent that clearing is not required by the development process, and that a 50 foot setback be maintained along the deepest ravine at the eastern edge of the property. These measures will serve to protect a limited amount of habitat for native wildlife, such as lizards, snakes, salamanders, chipmunks, mice and wood rats, as well as incidental SRBs.

The High Timber Ranch tract is located on Moonridge, immediately west of Sawmill Canyon and Sugarloaf, with developed property existing along the southwestern boundary. It has a north-facing exposure with several shallow ravines draining to the north-northwest and alternating with gently sloping ridges oriented in the same direction. The crowns of the ridges

are rather flat with small "pebble plain" habitats. Elevation at the upper levels of the property is about 7,200 feet. The vegetation is dominated by fairly open stands of Jeffrey Pine, mixed with small Black Oaks in much of the area. A shrubby understory is present in places, but with little sagebrush. Toward the eastern portion of the property there are occasional Pinyon Pines. Leaf litter and duff are moderately thick where there are Black Oaks, and well weathered medium-sized to large logs are common throughout the site. Significantly, again, no rock outcrops were observed.

My assessment of the High timber Ranch tract is that it is marginally suitable as SRB habitat. The northern exposure, denser vegetation, thicker layers of litter and duff, and greater abundance of large logs provide potential cover for SRBs and other forest floor wildlife. However, the site is outside of the area of potential habitat mapped in the 1985 SRB habitat guide, and no SRBs have been reported in the area. Still, I recommend that the portion of the site that I was not able to survey on foot be surveyed for rock outcrops by an experience field biologist, specifically Lisa Kegarice. Mitigations for development should be similar to those recommended for the Fawnskin site, with 50 foot setbacks along the ravines. If any rock outcrops 10 feet or greater in diameter are discovered in future surveys, they also should be protected by 50 foot setbacks.

I hope that the information and assessments I have provided above are sufficient for your purposes. Please find my invoice enclosed. If you have any questions or concerns, however, please do not hesitate to contact me by e-mail (grstewart@csupomon.edu) or phone (909-869-4093).

Sincerely yours,

Glenn R. Stewart, Ph.D.
Professor Emeritus of Zoology
and Environmental Science

TOM DODSON & ASSOCIATES
2150 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92405
TEL (909) 882-3612 • FAX (909) 882-7015
E-MAIL tda@tdaenv.com

May 1, 2007

Michael Perry
California Collaborative Solutions
P.O. Box 706
Big Bear City, CA 92314

RE: High Timber Ranch Survey

Dear Mr. Perry,

On February 9, 2007 I accompanied you and Dr. Glenn Stewart on a walking survey of the High Timber Ranch Property in the upper Moonridge area of Big Bear Lake. Dr. Stewart was able to survey approximately one half of the High Timber Ranch site that day and provided a February 18, 2007 letter report (attached) detailing his findings.

In his February 18, 2007 letter report, Dr. Stewart recommended that I survey the remainder of the High Timber site on foot to verify the absence of any rock outcrops.

On March 9, 2007, I surveyed the remainder of the site on foot with you and verified that there are no rock crops within the area of the site that Dr. Stewart did not survey on February 9, 2007.

If you need any additional information, please do not hesitate to contact me.

Sincerely,

Lisa Kegarice
Ecologist / Regulatory Specialist

Csp07/0501LK1 (CCS-193)

A.11 - Revised Supplemental Focused Special Status Plant Species Survey (Timothy Krantz, August 2010)

TIMOTHY KRANTZ
Environmental Consulting

MOON CAMP TENTATIVE TRACT 16136

FOCUSED SPECIAL STATUS PLANT SPECIES SURVEY

Prepared for:
Michael Brandman Associates
621 E. Carnegie Dr., Suite 100
San Bernardino, CA 92408

Prepared by:
Dr. Timothy P. Krantz
Timothy Krantz Environmental Consulting
(a division of Pangaea Nova LLC)
P.O. Box 33
Angelus Oaks, CA 92305

August 29, 2010

Project site location:	USGS Fawnskin 7½-minute topographic map, Township 2 North, Range 1 West, portion of Section 13.
Assessors Parcel Nos.:	0304-082-04 and 0304-091-12, 13 and 21
Owner /Applicant:	Tim Wood, RCK Properties, P.O. Box 6820, Big Bear Lake, CA 92315
Principal Investigator:	Dr. Timothy P. Krantz, (909)748-8590

MOON CAMP TENTATIVE TRACT
FOCUSED SPECIAL STATUS PLANT SPECIES SURVEY

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MOON CAMP TENTATIVE TRACT 16136
FOCUSED SPECIAL STATUS PLANT SPECIES SURVEY

I. PURPOSE AND OBJECTIVES

A supplemental botanical survey was conducted to address comments submitted by concerned parties with regard to the Draft Revised and Recirculated Environmental Impact Report for the Moon Camp 50-Lot Residential Subdivision, Tentative Tract 16136. Specifically, this botanical survey focused on clarifying the following information:

- Reconcile differences between the findings of Scott White (White 2007) and Krantz (2008) with regard to the presence or absence of *Castilleja cinerea*;
- Provide additional quantitative and qualitative information with regard to *Castilleja cinerea* (CACI) and any other formally-protected plant species on site;
- Consider potential off-site impacts on the U.S. Forest Service pebble plain known to occur to the northeast of the project site; and
- Provide comparable quantitative and qualitative information with regard to the proposed off-site pebble plain mitigation area located at the terminus of Dixie Lee Lane.

These findings augment the Supplemental Focused Rare Plant Survey conducted by Dr. Krantz, dated June 29, 2008, providing an additional above-average precipitation year for observation. Particular attention was given to assessing the distribution and abundance of CACI—as this is the only formally-listed rare plant species identified on the Moon Camp property.

II. METHODOLOGY

The San Bernardino County Planning Department is reviewing a Revised and Recirculated Draft Environmental Impact Report for the Moon Camp 50-lot residential subdivision, Tentative Tract 16136. The project site is on the north shore of Big Bear Lake, in the eastern part of the community of Fawnskin, on unincorporated land in San Bernardino County. The project site is comprised of about 62 acres, situated on both sides of State Highway 38, between Canyon Road and Polique Canyon Road (on the Fawnskin USGS 7½' quadrangle map, in the north half of Section 13, Township 2N and Range 1W). The project site slopes from north to south. Elevation ranges from 6,960 feet in the northeastern portion of the site to 6,750 feet near the lakeshore (see Figures 1 and 2).

The Moon Camp property was surveyed on June 11, 26 and 27, and on July 27, 2010. The focus of the 2010 surveys was on the previously identified occupied habitat areas of CACI. The bench-top openings to the southeast of the property that were previously and erroneously identified as CACI habitat by the White surveys of 2007 (as discussed in Krantz 2008) were also re-visited; and the pebble plain situated on U.S. Forest Service property northeast of the Moon Camp property was also surveyed.

The Dixie Lee Lane pebble plain, proposed as off-site mitigation, was also examined, and line transects were tabulated across the habitat to determine abundance of *Castilleja cinerea*, *Arenaria ursina* and *Eriogonum kennedyi austromontanum* at that location.

III. DISCREPANCY BETWEEN FINDINGS OF WHITE (2007) AND KRANTZ (2008)

As discussed in the Krantz (2008) botanical report for the Moon Camp property, the previous findings of Scott White (2007) were found to be erroneous with respect to identifying two occurrences of CACI habitat located to the southeast portion of the property. The discussion of this discrepancy is cited below:

> Ashy-gray paintbrush (*Castilleja cinerea*) had been mapped as four distinct occurrences by White, but the author, in conjunction with this survey, found that the two eastern occurrences, indicated as occurring behind (north of) Lots 22, and 29-30-31, do not support any ashy-gray paintbrush plants. There were openings of Wright's matting buckwheat at these locations, with silver rat-tails (*Ivesia argyrocoma*), which is sometimes associated with pebble plains, and Heckard's paintbrush (*Castilleja montigena*) was found on the perimeter of the openings, but no ashy-gray paintbrush exists at those locations. To verify that the author was, indeed, at the proper locations, the areas considered to be concurrent with those areas indicated by White were delineated with GPS data points to confirm the negative findings.
>
> Similarly, the GPS delineation of the middle ashy-gray paintbrush occurrence was found to be less than one-third the size of the occupied habitat indicated in the White survey. This occurrence corresponds to the southernmost portions of proposed Lots 47 and 48, adjoining Highway 18. In this case, it appeared that White had mapped the Wright's matting buckwheat distribution, without regard to association with the ashy-gray paintbrush.
>
> The primary pebble plain (the westernmost occurrence according to White) was found to be more restricted than indicated by White at the eastern portion of the occurrence, but generally conformed to the area indicated by White in the area of the central pebble plain (within the proposed rare plant preserve) and toward the western portion of the pebble plain and ashy-gray paintbrush area.

All areas identified by White as containing CACI were re-visited during this 2010 survey. Once again, no CACI was found to occur at the two southeasterly sites, and the middle occurrence was confirmed as delineated in the 2008 survey. The general distribution of the westerly CACI occurrence was approximately the same as in both the White and Krantz (2008) surveys; and further delineating and quantifying the CACI within this westerly occurrence was the primary focus of this 2010 survey.

IV. FOCUSED SURVEY OF *CASTILLEJA CINEREA*

One of the primary objectives of this botanical survey was to complete a more definitive assessment of the Federally-Threatened plant species—*Castilleja cinerea*—otherwise known as the ashy-grey Indian paintbrush. *Castilleja cinerea* (henceforth, CACI) is endemic to the northeast San Bernardino Mountains, with an overall distribution ranging from Snow Valley (1,828m a.s.l.) to the west, Holcomb Valley to the north, through Big Bear Valley to Baldwin Lake, thence southeast to Onyx Peak, and west along Sugarloaf Ridge, extending up to 3,032m (9,950 feet) above sea level. It occurs mostly in association with pebble plains habitat, but also basin sagebrush scrub, yellow pine, and lodgepole pine forest. On the Moon Camp property, CACI occurs in the yellow pine forest (*Pinus jeffreyi)* plant community.

CACI is a perennial plant, and therefore, should be identifiable in the appropriate season year after year. It is a hemiparasite, that is, it is at least partially parasitic on host plants for nutrients. CACI is usually associated with one of several buckwheat (*Eriogonum*) or mugwort (*Artemisia*) species. On pebble plains it is usually associated with Kennedy's buckwheat (*Eriogonum kennedyi* subspecies), but this pebble plains indicator species does not occur on site. In the case of Moon Camp, CACI is associated with *Eriogonum wrightii subscaposum* (Wright's matting buckwheat) and perhaps occasionally on *Artemisia ludoviciana* or *A. tridentata.*

Based upon the initial field survey results of June, 2010, high densities of CACI plants were observed on the westernmost Lots in the area west of "Street A"—the public roadway through the property. Densities as high as seven (7) CACI plants per square meter were tabulated in a very dense occurrence extending across the originally-enumerated Lots 1, 2 and 3. After consultation with the Applicant's Representative and the Environmental Impact Report consultant team, the original Lot configuration was revised to create a new Lot "H" Open Space Conservation Easement over the original Lots 1-3; and three new Lots 1-3 were designated along the south side of Street "A", with much lower densities of CACI.

The results of these quantitative CACI surveys are summarized below.

<u>Confirmation of Absence of CACI at Eastern Locations</u>

Scott White identified two eastern occurrences of CACI in his 2007 botanical report, indicated as occurring behind (north of) Lots 22, and 29-30-31 of the adjacent existing residential tract (White 2007). These were found to not support any ashy-gray paintbrush plants by Krantz in 2008; and their absence was confirmed during this survey. In both cases, Wright's matting buckwheat is present and widespread in the openings corresponding to White's locations, but there are no CACI plants, and nothing that could be mistaken for CACI (*Castilleja montigena* was observed at the edges of one of the locations). One can only assume that because 2007 was a record drought year, White had simply mapped the distribution of Wright's matting buckwheat and recorded the locations because of their potential for CACI; however, there is no question that these locations do not harbor any CACI plants now, nor did they in 2007. Because CACI is a perennial plant, these

occurrences do not "come and go" year to year, depending upon seasonal rainfall (or lack thereof), as annual plants sometimes do.

Discrete Occurrences of CACI

Occurrences of CACI identified by Krantz (2008) were confirmed during this survey, including approximately 50 plants at the location at the rear of proposed Lots 47-48; nine plants at the rear of Lot 49; and three plants on the west bank of the swale at the rear of Lot 50. A recent large tree-fall above the swale may alter the exposure and drainage pattern immediately around the swale, but the three CACI plants were still observed at this location at this time.

Open Space Lot A

A discrete count of the CACI plants occurring on Lot A was conducted by systematically walking the surrounding area of the knoll at this location. Altogether, a total of ~230 CACI plants were tallied within the Lot A area.

Open Space Lot H

The newly-proposed Lot H Open Space Conservation Easement was created to protect the high densities of CACI occurring in this area. The highest concentration of these plants extends in a broad opening in the Jeffrey pine woodland, in association with Wright's matting buckwheat. Altogether, approximately 4,665 CACI plants were estimated to occur in this area based on a combination of discrete counts and a belt transect through the middle of the highest density area.

Lots 1-5, Road Easement and Well Lot F

Discrete tallies of CACI plants were conducted on Lots 1-5 of the revised Moon Camp subdivision, including the new Lots 1, 2, and 3. The new Lot 1 contains approximately 45 plants, all located within a 5m-radius of the southeast corner of the property. Although these plants are within the rear-lot and side-lot building setbacks, they are considered as a "take" because they are not included in the Conservation Easement areas.

CACI plants on the new Lot 2 are scattered across the Lot, with approximately 150 plants.

The new Lot 3 contains approximately 175 plants. Lot 4 contains approximately 70 plants to the front-center of the Lot, and another 20 plants to rear of the Lot (not in the buildable area of the Lot), for a total of ~90 plants; and Lot 5 contains approximately 30 plants and another ~40 CACI plants are in the road right-of-way across the front of Lot 5. Well Site Lot F and the associated access road contain approximately 80 plants.

Summary of CACI Occurrence on the Moon Camp Site

Altogether, then, one finds these total estimated numbers of CACI plants on the Moon Camp property:

Lot 1— 45 plants
Lot 2— 150 plants
Lot 3— 175 plants
Lot 4— 90 plants
Lot 5— 30 plants
Lot 47— 50 plants
Lot 49— 9 plants

Lot 50— 3 plants
Lot A— 230 plants
Lot F— 80 plants
Road ROW- 40 plants
Lot H— 4,665 plants

TOTAL 5,567 plants

Of the 5,567 CACI plants estimated to occur on site, 4,895 plants will be protected within Lot A and H, representing 88% of the total number of plants. Of the remaining CACI plants on private Lots, plants within Lots 1, 47, 49, and 50 are all within the rear Lot building setbacks, as well as 20 plants on Lot 4, for a total of 127 plants; however, these are still considered as "take" specimens because they are not within formally-protected Conservation Easements on the property.

V. SURVEY OF THE U.S. FOREST SERVICE POLIQUE CANYON PEBBLE PLAIN

A survey was conducted of the pebble plain located on U.S.F.S. property, located generally within the NE/4 of the SE/4 of Section 12, Range 1 West, Township 2 North, San Bernardino Baseline and Meridian.

The Polique Canyon pebble plain is situated along a bench-top ridge northeast of the Moon Camp project site. The ridge runs generally north-to-south for a distance of about 290 meters (950 feet), with two small openings of approximately one acre each that support pebble plains vegetation. These are true pebble plains, with both of the indicator species—*Eriogonum kennedyi austromontanum* and *Arenaria ursina*—used to map the distribution of pebble plains habitat (Krantz 1981). Other associated pebble plains species include *Arabis parishii, Erigeron aphanactis, Ivesia argyrocoma* and *Lewisia rediviva.*

The pebble plain exhibited the impacts of off-highway vehicle use, with a motorcycle track that runs the entire length of the bench top, with access to the pebble plains from the northwest toward the residential subdivision in that direction, and to the northeast, where the motorcycle track connects with Polique Canyon Road. The Forest Service has placed logs and branches across the northern entry to the motorcycle track to prevent vehicular access to the pebble plains, with some success, as there was no evidence of recent motorcycle activity on the pebble plains.

The Polique Canyon pebble plains are situated approximately 325m (1,056 feet) northeast of the Moon Camp property, at an elevation of about 60m (200 feet) above the project. Forest Service comments on the Revised and Re-circulated DEIR expressed concern that development of the Moon Camp property could represent an indirect impact to the pebble plains from foot traffic generated by the Moon Camp residents. There is no apparent footpath or trail connection between the Moon Camp property and the pebble plains. For Moon Camp residents to hike up to the pebble plains, they would have to traverse up the 300+ meter-ridge with a 60m-elevation gain across the brush-covered slope.

VI. SURVEY OF THE DIXIE LEE LANE PEBBLE PLAIN

The Dixie Lee Lane pebble plain is situated at the northern terminus of the street of the same name at the northwest corner of the community of Sugarloaf. It is a ten-acre, discrete pebble plain situated in a pinyon-juniper/Jeffrey pine woodland. It is one of a series of bench-top pebble plains extending from Upper Moonridge and the U.S.F.S.-owned Sawmill pebble plain on the west, to the once-expansive pebble plain situated on either side of Maple Lane road leading into the community of Sugarloaf from Big Bear City.

The Dixie Lee Lane pebble plain was originally proposed as a mitigation bank for the partial offset of impacts of development of the Big Bear High School on Maple Lane, which was formerly the site of a large pebble plain of the Sugarloaf series. The development of the High School required a Minor Subdivision of the parent parcel, including the Dixie Lee Lane pebble plain. At the time, pebble plains and their associated species were not formally listed or protected as endangered or threatened species; and the establishment of an off-site mitigation bank for the High School was considered adequate mitigation for the impacts of the High School project. The complete 10-acre

pebble plain was surveyed by Hicks & Hartwick Engineering, with the idea that two acres of the 10-acre pebble plain would be used to mitigate for the High School, and the remainder would be available for mitigation of other projects with pebble plain-related impacts. However, the 10-acre mitigation bank and two-acre subdivisions of it were never actually recorded.

The Moon Camp project is proposing to establish permanent protection of the entire 10-acre pebble plain at Dixie Lee Lane as part of their rare plant mitigation program. This supplemental botanical survey focused on providing a quantitative and qualitative assessment of the proposed Dixie Lee Lane pebble plain.

Survey Results

Three belt transects were tallied on the Dixie Lee Lane pebble plain to determine approximate densities of the three Federal-Threatened plant species that occur there: *Arenaria ursina* (ARUR), *Eriogonum kennedyi austromontanum* (ERKEA) and *Castilleja cinerea* (CACI), with the following results.

The Dixie Lee Lane pebble plain is a textbook example of this unique rare plant community. The original "type" pebble plain was described by Derby and Wilson (1978) based upon the Sawmill pebble plain—one of the Sugarloaf series of pebble plains situated two bench tops to the west of the Dixie Lee Lane population. The Dixie Lee Lane occurrence has relatively discrete borders with the surrounding pinyon-juniper-Jeffrey pine forest, indicating the dense clay substrate that prevents the competing pine seedlings from becoming established on the open plain. The surface of the pebble plain exhibits the classic vestiture of Saragossa quartzite pebbles and cobbles resulting from frost heave of the pebbles during winter freezing and thawing cycles of the clay soil, resulting in the pebbles being pushed to the surface of the clay.

The dominant species on the pebble plain are the two Federal-Threatened Big Bear-area endemics—ARUR and ERKEA—with the full suite of associated plant species, including several other Big Bear endemics and other rare plants found almost exclusively on pebble plain habitats, including the following:

Antennaria dimorpha		
Arabis parishii	Big Bear endemic	CNPS List 1B.2
Arenaria ursina	Big Bear endemic	Federal Threatened
Castilleja cinerea	Big Bear endemic	Federal Threatened
Cusickiella douglasii c.		
Erigeron aphanactis		
Eriogonum kennedyi a.	Big Bear endemic	Federal Threatened
Ivesia argyrocoma	SB Mts and Baja C.	CNPS List 1B.2
Lewisia rediviva minor		
Linanthuskillipii	Big Bear endemic	CNPS List 1B.2
Mimulus purpureus	BB near-endemic	CNPS List 1B.2

The three belt transects were established accordingly: one in the northern pebble plain opening, one across the middle opening, and one through the southern (entry from Dixie Lee Lane) opening. The transects were extended to 50m-lengths, and ten meter-square plots were tallied at 5m intervals along the transects, alternating right- to left-of-center line meter-squares to randomize the meters

selected for counting. The Federal-listed species were counted with regard to the number of mature (flowering or woody stems) and seedling plants per meter-square.

A total of 128 ARUR plants were tallied in the 30 meter-square plots, for an average density of 4.3 plants per square meter. ERKEA plants exhibited a total of 475 flowering plants (and at times countless seedlings/m2!) in the 30 meter-square plots, for an average density of 15.8 plants per square meter. CACI was infrequent on the pebble plain, with only 21 plants tallied, limited to the north end of the pebble plain along the northeast edge of the opening. These plants were all in association with ERKEA.

A large number of ERKEA plants were observed to be recently dead or dying in the area of the pebble plain with the CACI, and in several other areas, with as many as 8.9 dead ERKEA crowns/m2 in the transect near the CACI occurrence. Some areas not sampled in the transects exhibited nearly 100% ERKEA mortality. These areas were associated with a high density of introduced cheat grass, *Bromus tectorum*. Similar ERKEA die-offs were observed by the author earlier this season at North Baldwin Lake; and this worrisome qualitative condition may deserve further evaluation with regard to pebble plain conservation.

Extrapolating these densities of the Federal-Threatened pebble plains indicator species across the entire Dixie Lee Lane pebble plain, one arrives at a total population for ARUR and ERKEA in the tens of thousands. To the best of the author's knowledge, this represents the highest densities of pebble plains species remaining on privately-owned land in Big Bear Valley.

VI. SUMMARY OF FINDINGS

The objectives of this supplemental botanical survey of the Moon Camp property were addressed as follows in the brief summary of findings described below.

The areas of discrepancy of reported CACI occurrence between the Scott White reports (2002 and 2007) and the Krantz supplemental report (2008) were revisited in the field, and the findings of the Krantz report were confirmed. There are no CACI plants on the two easterly occurrences reported by White.

The other CACI occurrences were confirmed in the field, the aerial extent of the occurrences were delineated, and numbers of CACI plants were discretely counted where possible, or estimated via quantitative transects in the larger occurrences. Altogether, a total of 5,567 CACI plants were estimated to occur on the Moon Camp property. Of these, 4,895 plants will be conserved within the Conservation Easements on Lot A and Lot H, representing 88% of the entire Moon Camp population. Lot H will represent the first formally-designated conservation easement dedicated to the preservation of this unique species.

The Polique Canyon pebble plain, situated on Forest Service land above and to the northeast of the Moon Camp property was surveyed, and was found to represent a true pebble plain ensemble of species, including the two indicator species, *Arenaria ursina* and *Eriogonum kennedyi austromontanum.* The Polique Canyon pebble plain has experienced impacts from unauthorized motorcycle activity in the recent past, with a motorcycle track running through the pebble plain from the Polique Canyon road area. The Forest Service has attempted to block this illegal off-

highway vehicle activity by laying branches and logs across the track, with apparent success. No impacts from existing adjacent pedestrian traffic were observed on the pebble plain. No off-site, indirect impacts of pedestrian foot traffic is anticipated from the Moon Camp property, as Moon Camp is more than 1,000 feet south of the Polique Canyon pebble plains, separated by brush without an established trail, and is several hundred feet in elevation below the pebble plains.

The "pebble plain" on Lot A, as identified in previous botanical reports by White *et alus*, has some of the soil characteristics of a pebble plain, but lacks the two indicator threatened plant species (*Eriogonum kennedyi austromontanum* and *Arenaria ursina*). Therefore there is technically no pebble plain on the property that requires mitigation.

The Dixie Lee Lane pebble plain, proposed for off-site mitigation of the Moon Camp project, was surveyed, and quantitative belt transects were tallied to estimate the abundance of Federal-Threatened species at that location. This ten-acre pebble plain exhibits very high densities of the two indicator species (mentioned above), with an estimated population in the tens of thousands for these two Federal-Threatened species. CACI was found to be poorly represented on the Dixie Lee Lane parcel, however, with only 21 plants observed.

VIII. REFERENCES

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Appendix B:
Water Feasibility Studies

B.1 - Recommended Alternative for DWP (Alda Engineering Inc., February 2011)

ALDA Engineering Inc.
5928 Vineyard Avenue
Alta Loma, CA 91701
Tel: (909) 587-9916
Fax: (909) 498-0423

February 7, 2011

Bill La Haye, Water Resources Manager
Big Bear Lake Department of Water & Power
41972 Garstin Drive
Big Bear Lake, CA 92315

Subject: **Moon Camp Development Project – Tentative Tract 16136**
Recommended Alternative to Provide Water Service

Dear Mr. La Haye:

The purpose of this letter is to document the recommended alternative to serve the proposed Moon Camp Development Project in the Fawnskin area. Initially, two alternatives to serve this development were documented in our March 2007 Feasibility Study. Both alternatives considered serving the development off the Upper Fawnskin pressure zone and differ from each other on the alignment of recommended transmission facilities and the size of pumping units.

The recommended alternative (Alternative "B") consists of serving the proposed development by gravity off the existing Racoon Reservoir. Initially, this alternative included the replacement of two undersized pipeline segments that were built along property lines; thus requiring a construction and operations easement. Since the recommended alternative was initially configured, it has been determined that construction along one of these segments will be extremely difficult due to the steepness of the terrain; hence new alignment had to be selected along Ridge Road. Figure 1 illustrates the revised alignment for the recommended alternative; facility requirements to implement this alternative are listed below.

- 900 ft of 12-inch pipeline along Ridge Road from the intersection of Raccoon Drive south to tie to an existing 8-inch PVC pipeline on a private easement.
- 200 ft of 12-inch pipeline along private easement to connect Fawnskin Drive and Canyon Road
- 650 ft of 12-inch pipeline along Canyon Road to Chinook Road
- 600 ft of 12-inch pipeline along Chinook Road to Flicker Road
- 500 ft of 12-inch pipeline along Flicker Road to Mesquite Drive
- 400 ft of 12-inch pipeline along Mesquite Road to North Shore Drive
- 250 ft of 12-inch pipeline along North Shore Drive to development westerly boundary

- Refurbishing existing Cline Miller pump station to augment pumping capacity to approximately 300 gpm
- 50 KW on-site emergency generator at the Cline Miller Reservoir

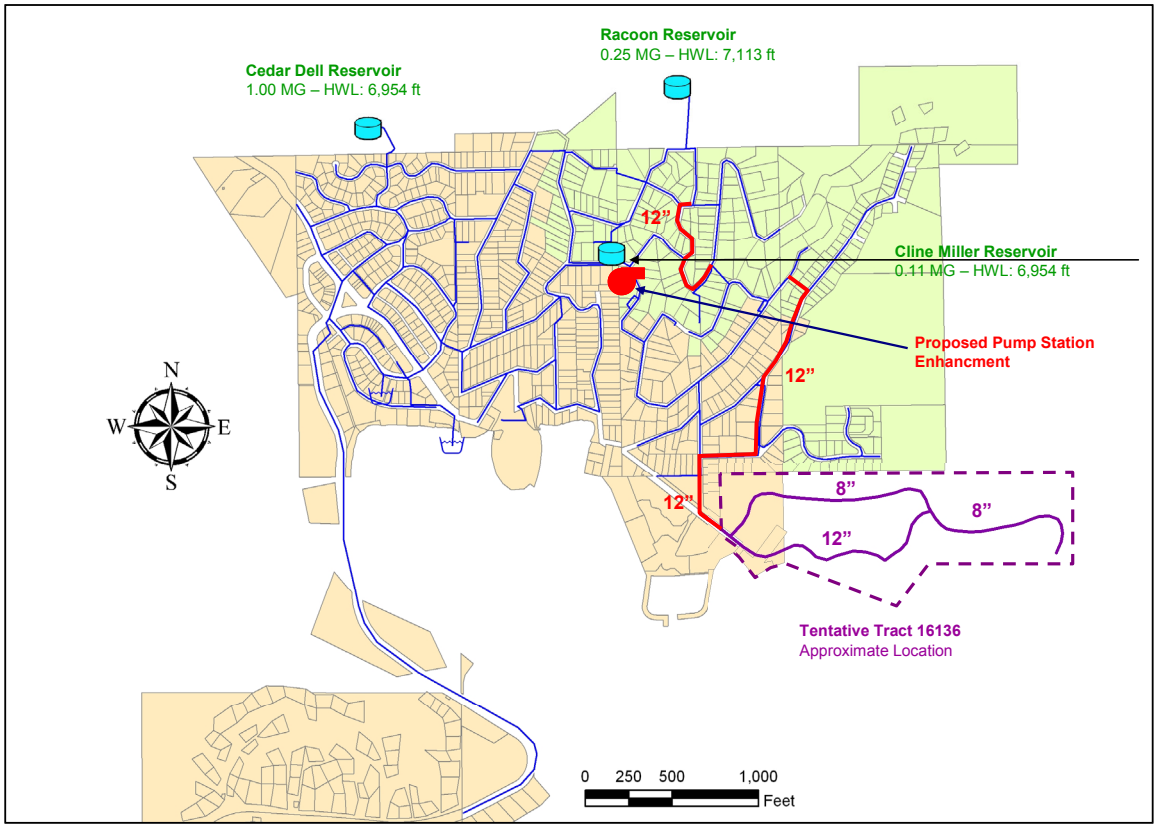

Figure 1

Recommended Facilities to Serve Tentative Tract 16136

Should you have any questions on this matter, please contact us at 909-587-9916 during normal business hours.

Very truly yours

ALDA Engineering Inc.

F. Anibal Blandon, P.E.
Principal

B.2 - Water Feasibility Study (Alda Engineering Inc., March 2007)

ALDA Engineering Inc.
9996 Orange Street
Alta Loma, CA 91737
Tel: 909-297-3741
Fax: 909-498-0423

March 6, 2007

Mr. Scott Heule, C.E.G./C.H.G., Assistant General Manager
City of Big Bear Lake
Department of Water & Power
41972 Garstin Drive
Big Bear Lake, CA 92315

Subject: **Final Feasibility Study to Serve the Proposed Moon Camp Residential Development** (Tentative Tract No. 16136)

Dear Mr. Heule:

Pursuant to your request, ALDA Engineering Inc. (ALDA) has conducted a feasibility study to determine the necessary system facilities to serve the above referenced development. This report summarizes the results of our investigation and recommendations. This report presents the project background, an assessment of demand and supply issues, the results of the system analysis, and the recommended improvements.

Project Background

The proposed Moon Camp development consists of 50 residential lots to be developed over approximately 62 acres of land. The proposed development is located along North Shore Drive, in the community of Fawnskin on the north side of Big Bear Lake, and ranges in elevation from approximately 6,750 ft. near the lake to approximately 6,950 ft. in the northeasterly quadrant. Individual lots range in size from approximately half an acre to well over two acres depending on location and are anticipated to be developed as single family residential units; average lot size is approximately one and a quarter acres. Because of its location and lot size, some of the residential units are anticipated to be fairly large and potentially exceed 4,000 square feet in size.

Water service to the proposed development will be provided off the Upper Fawnskin pressure zone as the Lower Fawnskin zone would not provide enough static head to provide the development adequate fire flow. DWP's closest pipeline off the Upper Fawnskin system is a single 6-inch diameter pipeline located near the intersection of Flicker Road and Chinook Road, approximately 2,000 ft away from the westerly boundary of the proposed development. Significant transmission improvements in the Fawnskin system are needed to provide fire flow to the proposed tract.

Currently, there are two groundwater production wells within the proposed residential tract. These wells are located in subarea A of the North Shore hydrologic subunit. It is our understanding that these wells will be deeded to the DWP at the time the tract map is recorded. The developer plans to equip the FP-2 well initially to meet the development projected water demands. The DWP will use excess capacity from this well to help reduce reliance on the leased North Shore Well No. 1. Groundwater production capacity from this well is estimated at approximately 100 gallons per minute. The second well (FP-3), located to the east of the FP-2 well, will not be initially equipped by DWP.

Pressure Zone Service Area

Based on the elevation range of the proposed development, 6,750 ft. to 6,950 ft., the development can be served off the Upper Fawnskin pressure zone. This pressure zone has an operating hydraulic grade of 7,113 ft. set by the high water level of the existing 0.25-million gallon Racoon Reservoir. Based on this hydraulic elevation, static pressures would range from a low of 71 psi at the highest point in Lot 18 to 157 psi near the lake. Individual pressure regulators would be required for all lots with static pressures exceeding 80 psi.

Water supply in the Fawnskin area is provided by two groundwater wells in the Lower Fawnskin pressure zone and by slant wells in the vicinity of the Racoon Reservoir. Excess groundwater production from the Lower Fawnskin pressure zone is conveyed to the Upper Fawnskin pressure zone through a booster station located at the Cline Miller Reservoir.

Water Demand

Projected water demand for the proposed development is based on the average consumption rate of 250 gallons per day per connection. Maximum day demand is estimated based on information provided in the recently completed water master plan and it is equivalent to 1.76 times the average day demand. Therefore, the average and maximum day demands for the proposed 50-lot subdivision are estimated as follows:

- Average Day Demand (ADD) = 12,500 gpd or 8.68 gpm
- Maximum Day Demand (MDD) = 15.27 gpm

Based on an estimated average day demand of 12,500 gallons, the annual water demand for the development is estimated at 4.56 million gallons or 14.00 ac-ft per year.

Water Supply

Water supply sources for this development must meet projected maximum day demands during the summer as well as annual demands. The existing on-site FP-2 well, when equipped by the developer, would be capable of meeting the projected maximum day demand for the proposed Tract 16136.

To meet the projected annual demand, the developer would have to participate in the Water Demand Offset Plan currently being implemented by DWP. This plan requires that any development that creates new lots must pay for the necessary facilities to reduce water demand somewhere else in the service area. The demand to be reduced is equivalent to one half of the average water demand for residential parcels in the service area, estimated at 250 gallons per day, for each new lot developed. Therefore, in the case of the proposed tract, a demand equivalent to 6,250 gallons per day (50 EDUs times 250 gallons per day per EDU times 50 percent) would need to be offset.

Fire Flow Requirements

Fire flow protection in the Fawnskin area is provided by the County of San Bernardino Fire Department. Information obtained from the Office of the Fire Marshall for the county indicates the following fire flow requirements for residential structures in the Fawnskin area:

- Structures less than 3,600 ft^2 - 1,000 gpm @ 20 psi with a two-hour duration
- Structures between 3,601 to 4,800 ft^2 - 1,750 gpm @ 20 psi with a two-hour duration
- Structures between 4,801 to 6,200 ft^2 - 2,000 gpm @ 20 psi with a two-hour duration

Additional information provided by the Office of the Fire Marshall indicates that fire flow requirements could be lowered if fire sprinklers are installed; however, actual requirements are determined individually based on the construction plans for individual residences.

For the purpose of this analysis and based on discussions held with DWP staff, a fire flow of 1,750 gpm @ 20 psi with a two-hour duration was used to size transmission, pumping, and storage facilities that would be needed to serve the proposed development.

Storage Requirements

Storage capacity for this development was sized to meet the operational, emergency and fire flow storage requirements. Operational storage is used to meet the hourly fluctuations in demand during maximum day conditions and has been established as 30 percent of maximum day. Emergency storage is used to meet demands during a power outage or other emergency situation when supply sources and boosting pumps may not be available; DWP requirements for emergency storage are equivalent to one day of maximum day demand.

Fire flow storage is equal to the fire flow capacity (1,750 gpm) times its duration (two-hours). Storage requirements for the proposed development are as follows:

■ Operational Storage = 30% of MDD (15.27 gpm):	6,600 gallons
■ Emergency Storage = 100% of MDD (15.27 gpm):	22,000 gallons
■ Fire Flow Storage for 1,750 gpm (based on 120 min):	210,000 gallons
Total storage requirement for indoor use:	238,600 gallons

According to the recently completed water master plan, DWP has sized its storage facilities to provide a maximum fire flow of 1,500 gpm with a two-hour duration for residential development. Additional storage to provide incremental fire flow requirements would be the responsibility of individual developers in each of the pressure zones impacted. In the case of Tract 16136, the incremental fire flow of 250 gpm (1,750 gpm – 1,500 gpm) results in an additional storage requirement of 30,000 gallons. Storage requirements for operational and emergency storage are provided by the DWP as part of the meter connection charges.

Existing storage facilities in the Upper Fawnskin pressure zone consist of a single 0.25 million gallon reservoir that is fed by a combination of slant wells, located in the vicinity of the reservoir site, and the Cline Miller booster station that supplies water from the Lower Fawsnkin pressure zone. The existing reservoir capacity is adequately sized to meet current storage requirements of existing users while providing fire flow protection for a flow rate of 1,500 gpm over a two-hour duration. Current storage requirements in this zone are estimated at approximately 225,000 gallons; this value is approximately 10 percent below existing storage capacity.

An additional storage of 30,000 gallons would be required in the Upper Fawnskin pressure zone to supply the recommended 1,750 gpm fire flow over a two-hour duration. This additional storage could be provided by either constructing a second reservoir adjacent to the existing Racoon Reservoir or conveying surplus storage capacity in the Lower Fawnskin pressure zone through the existing Cline Miller booster station. This booster station consists of two booster units with a combined capacity of approximately 190 gpm. To make surplus storage from the Lower Fawnskin pressure zone available during power outages, a backup generator at the Cline Miller booster station would be needed. In addition, the capacity of the existing booster station would need to be increased to pump 303 gpm. This flow rate represents a combination of a) estimated maximum day demand at full development in the Upper Fawnskin pressure zone of 38 gpm, b) estimated maximum day demand of 15 gpm from tract 16136, and c) 250 gpm of incremental fire flow into the Upper pressure zone.

Alternatives to Serve Proposed Tract 16136

Under average and peak summer demands, the proposed development could be served by simply extending existing facilities in the Upper Fawnskin pressure zone. The closest facility in this pressure zone that the development can be connected to consist of a 6-inch pipeline in the vicinity of Flicker Road and Chinook Road. However, existing distribution facilities would not be able to provide the required fire flow capacity needed to protect future residential development in the area. Existing system facilities consist of pipelines ranging in size from 2 to 8 inches in diameter with limited fire flow carrying capacity.

To provide the fire flow requirements indicated by the Office of the Fire Marshall, transmission improvements will be required in the Upper Fawnskin pressure zone. Two alternatives were evaluated to serve the proposed development; a brief description of these alternatives and the required facilities is presented below. Figure 1 illustrates the alignment of proposed transmission facilities for each alternative and the recommended pipelines within the proposed residential tract.

Facilities Common to Both Alternatives. Transmission facilities south of the intersection of Flicker Road and Mesquite Drive to the westerly boundary of the proposed tract are common to both alternatives and consist of approximately 700 ft of 12-inch diameter pipeline. The alignment of this pipeline is shown in Figure 1.

Alternative A. This alternative consists of serving the proposed tract by constructing a dedicated 12-inch transmission pipeline from the vicinity of the Cline Miller Reservoir to the proposed development site. This alternative would also require the construction of a fire booster station at the Cline Miller Reservoir site to augment the capacity of the existing booster units as they are not adequate to provide the recommended fire flow capacity into the Upper Fawnskin pressure zone. To assure that the fire booster unit is operational during power outages, the installation of a 200 kilowatt on-site electric generator is recommended.

The alignment of the recommended transmission pipeline between the Cline Miller Reservoir and the intersection of Flicker Road and Mesquite Drive is depicted in Figure 1. The estimated length of this pipeline is approximately 2,450 ft.

Alternative B. This alternative consists of serving the proposed development by gravity off the existing Racoon Reservoir. Transmission improvements in the Upper Fawnskin pressure zone would be required as existing distribution facilities have limited fire flow carrying capacity; they consist primarily of small pipelines ranging in size from 2 to 8 inches in diameter. Recommended improvements consist of a series of 12-inch segments between the reservoir site and the intersection of Flicker Road and Mesquite Drive as illustrated in Figure 1. The estimated combined length of proposed facilities is approximately 2,800 ft.

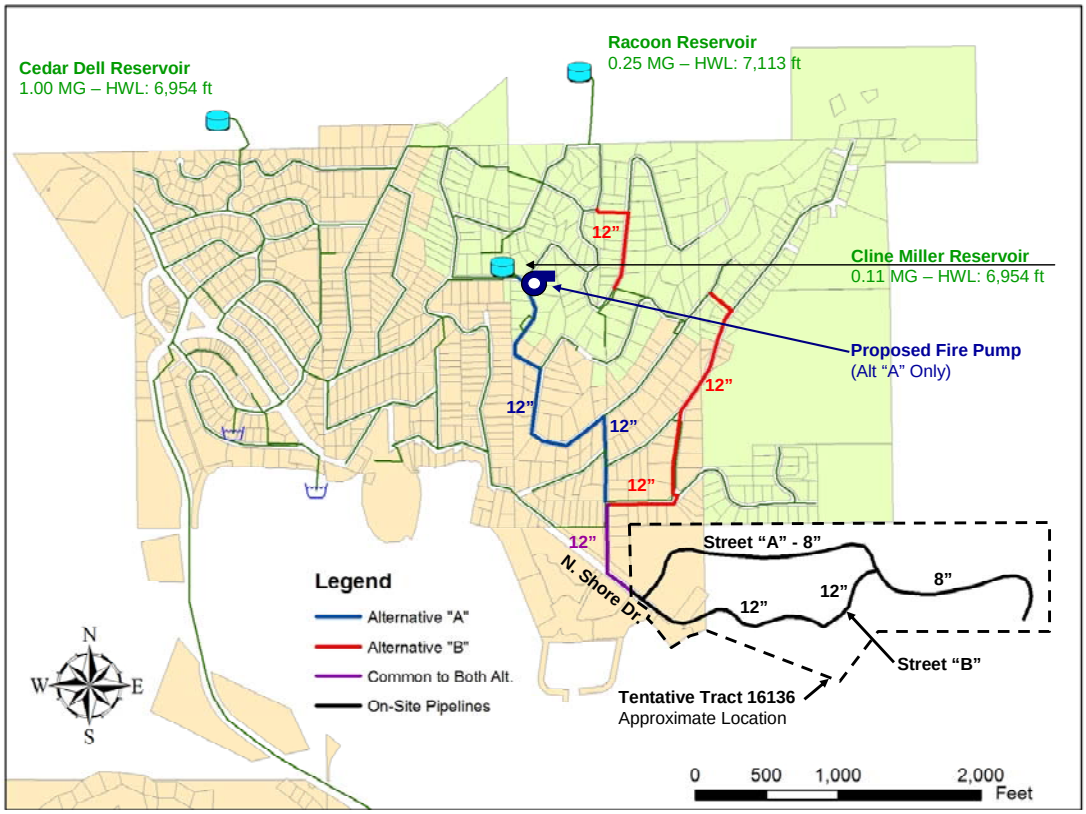

Figure 1
Tentative Tract 16136 - Recommended Facilities Both Alternatives

Alternative "B" would not require the construction of a fire pump at the Cline Miller Reservoir to pump from the Lower to the Upper Fawnskin pressure zone as the majority of the fire flow would be provided by gravity off the existing Racoon Reservoir. However, the existing Cline Miller booster station would have to be refurbished to increase its capacity to convey surplus storage from the Lower Fawnskin pressure zone during a fire flow event. The capacity of this booster station would be increased from its current capacity of 190 gpm to 303 gpm. In addition, an on-site generator would be required to operate the station during power outages. The enhancement of this booster station would eliminate the need to construct additional storage facilities in USFS lands, which are difficult to obtain approval for.

On-Site Facilities. The sizing of pipelines within the proposed tract is the same for both alternatives. Recommended pipeline diameters for the various street segments shown in Figure 1 are described as follows:

- North Shore Dr. from tract boundary to Street "A": 150 ft of 12-inch pipeline
- North Shore Dr. from Street "A" to Street "B": 1,600 ft of 12-inch pipeline
- Street "B" from North Shore Dr. to Street "A": 700 ft of 12-inch pipeline
- Street "A" from North Shore Dr. to Street "B": 2,000 ft of 8-inch pipeline
- Street "A" from Street "B" to end of Cul-de-sac: 1,500 ft of 8-inch pipeline

Estimated Cost of Improvements

The capital cost of proposed improvements was based on construction information provided by DWP and from other construction cost information available. The estimated cost of construction for pipelines is estimated at $15 per diameter inch; the cost for pump stations is estimated at $2,500 per horsepower. Construction contingencies are estimated at 20 percent while engineering cost is estimated at 15 percent.

It should be noted that estimated capital cost of proposed improvements shown here is for planning purposes only; actual cost of improvements may vary significantly depending on materials and labor cost at the time of construction.

Alternative "A" – Dedicated line from the Cline Miller Reservoir

■ 2,450 ft of 12-inch diameter off-site pipeline	$ 440,000
■ 700 ft of 12-inch diameter off-site – Common to both Alt.	$ 130,000
■ 175 Hp Cline Miller booster fire pump	$ 440,000
■ 200 KW on-site emergency generator (1)	$ 65,000
Sub-total:	$ 1,075,000
Contingency during construction – 20 percent	$ 215,000
Engineering, administration, inspection – 15 percent	$ 165,000
Overall construction cost for off-site improvements	$ 1,455,000

(1) Capital cost estimate includes cost of generator and transfer switch.

Alternative "B" – Gravity flow from the Racoon Reservoir

■ 2,800 ft of 12-inch diameter off-site pipeline	$ 505,000
■ 700 ft of 12-inch diameter off-site – Common to both Alt.	$ 130,000
■ Refurbishing of existing Cline Miller booster station	$ 100,000
■ 50 KW on-site emergency generator (1)	$ 35,000
Sub-total:	$ 770,000
Contingency during construction – 20 percent	$ 155,000
Engineering, administration, inspection – 15 percent	$ 115,000
Overall construction cost for off-site improvements	$ 1,030,000

(2) Capital cost estimate includes cost of generator and transfer switch.

Recommendations

The implementation of either alternative should provide the proposed development with the necessary facilities to meet the recommended fire flow protection of 1,750 gpm during maximum day demand conditions. However, Alternative "B" is preferred because it also enhances the distribution and fire flow capacity of the existing system in the Upper Fawskin pressure zone. In addition, the implementation of this alternative is approximately 29 percent less expensive than Alternative "A".

Disclaimer

This feasibility study is based on current system conditions and it is valid for a period of 12 months from the date of this letter. The feasibility of developing the Tract 16136 subdivision may need to be revised and/or reassessed if the project is delayed for a significant period of time. Revisions may result from changes in future water demands, system conditions, and construction cost of recommended facilities.

Should you have any questions, please contact us at 909-587-9916 during normal business hours.

Very truly yours

ALDA Engineering Inc.

F. Anibal Blandon, P.E.
Principal

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