

Recirculated Draft Environmental Impact Report for the RIMFOREST STORM DRAIN PROJECT

Prepared by:



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Department of Public Works
Flood Control District**

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Recirculated Draft Environmental Impact Report for the Rimforest Storm Drain Project

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Executive Summary

This Recirculated Draft Environmental Impact Report (EIR) has been prepared pursuant to the requirements of the California Environmental Quality Act (CEQA). The County is the lead agency under CEQA. CEQA requires the lead agency to consider the information contained in an environmental review document, prior to taking any discretionary action. This Recirculated Draft EIR will serve as an informational document in addition to the original Draft EIR to be considered by the County and other local and state permitting agencies during their respective processing of the proposed project.

The Recirculated Draft EIR for the proposed project has been prepared to inform the public of changes to the original document resulting from additional analysis for biological resources and hydrology and water quality. A downstream habitat and flow assessment for Strawberry Creek and Lower East Twin Creek was completed to more accurately characterize potential effects, downstream from the proposed project. Results from this assessment have been included in the Recirculated Draft EIR. Additionally, corrections have been made to a few references in the original cultural resources Draft EIR section.

The Recirculated Draft EIR contains an updated biological resources analysis (Section 3.3), updated cultural resources section (Section 3.4), updated hydrology and water quality analysis (Section 3.6), updated Cumulative Effects section (Section 5), and an updated References section (Section 7). No changes to impact conclusions have occurred based on the additional analyses performed. Only those sections that have changed from the original Draft EIR published in September 2015 are included in this Recirculated Draft EIR, per CEQA Guidelines 15088.5(c).

This Draft Environmental Impact Report (EIR) was prepared to address the environmental effects associated with implementation of the proposed Rimforest Storm Drain Project (proposed project). The County of San Bernardino, Department of Public Works (County) proposes to construct the proposed project, which involves construction and maintenance of a series of drainage facilities to address historic erosion and landsliding in the southern Rimforest community. The San Bernardino County Flood Control District (SBCFCD), a separate legal entity, is acting in an advisory capacity to the County for this project.

The County, as the Lead Agency under the California Environmental Quality Act (CEQA), prepared this EIR for the proposed project. This EIR is an informational document for the general public and governmental agencies to review and evaluate the proposed project. The reader should not rely exclusively on the Executive Summary as the sole basis for judgment of the proposed project and alternatives; rather, the complete EIR should be consulted for specific information about the environmental effects and the implementation of associated mitigation measures.

Responsible and Trustee Agencies, other agencies with review authority over the proposed project, and agencies with which the County would need to coordinate aspects of the proposed project include the following:

- State Water Resources Control Board, Santa Ana River and Lahontan Regional Water Quality Control Boards (review and enforcement stormwater discharges and authority over any other water or waste discharges; water rights transfer agreement)
- California Department of Fish and Wildlife (review and agreement for any streambed alteration or incidental take authorization that may be required)
- California Department of Transportation (review and authority over any Project-related activity within a state-owned transportation Right-of-Way [ROW])
- California Highway Patrol (coordination regarding haul route traffic on state highways)

- U.S. Army Corps of Engineers (review of potential discharges or effects on federal jurisdictional waters or wetlands)
- South Coast Air Quality Management District (review of construction-related emissions)
- San Bernardino County Fire Department (review and authority over any project-related activity within a County-owned transportation ROW or within a Fire Safety Overlay)
- San Bernardino County Sheriff's Department (review and authority over any project-related activity with a County-owned transportation ROW)
- San Bernardino County Solid Waste Management Division (permit authority over project-related waste disposal)

ES.1 Summary of Proposed Project

The proposed project is located in the community of Rimforest, in the San Bernardino Mountains near Lake Arrowhead, approximately six miles north of the City of San Bernardino in the County of San Bernardino, California (Figure ES-1). The proposed project would restore runoff from its current flow-path through the community of Rimforest and outlet at the landslide area in southern Rimforest, into a new flow-path comprised of channels and pipeline to the north of SR-18, with an outlet into Little Bear Creek on the COTW property (Figure ES-2). In re-directing this runoff, the proposed project would result in runoff flowing into the Mojave River Watershed instead of the Santa Ana River Watershed.

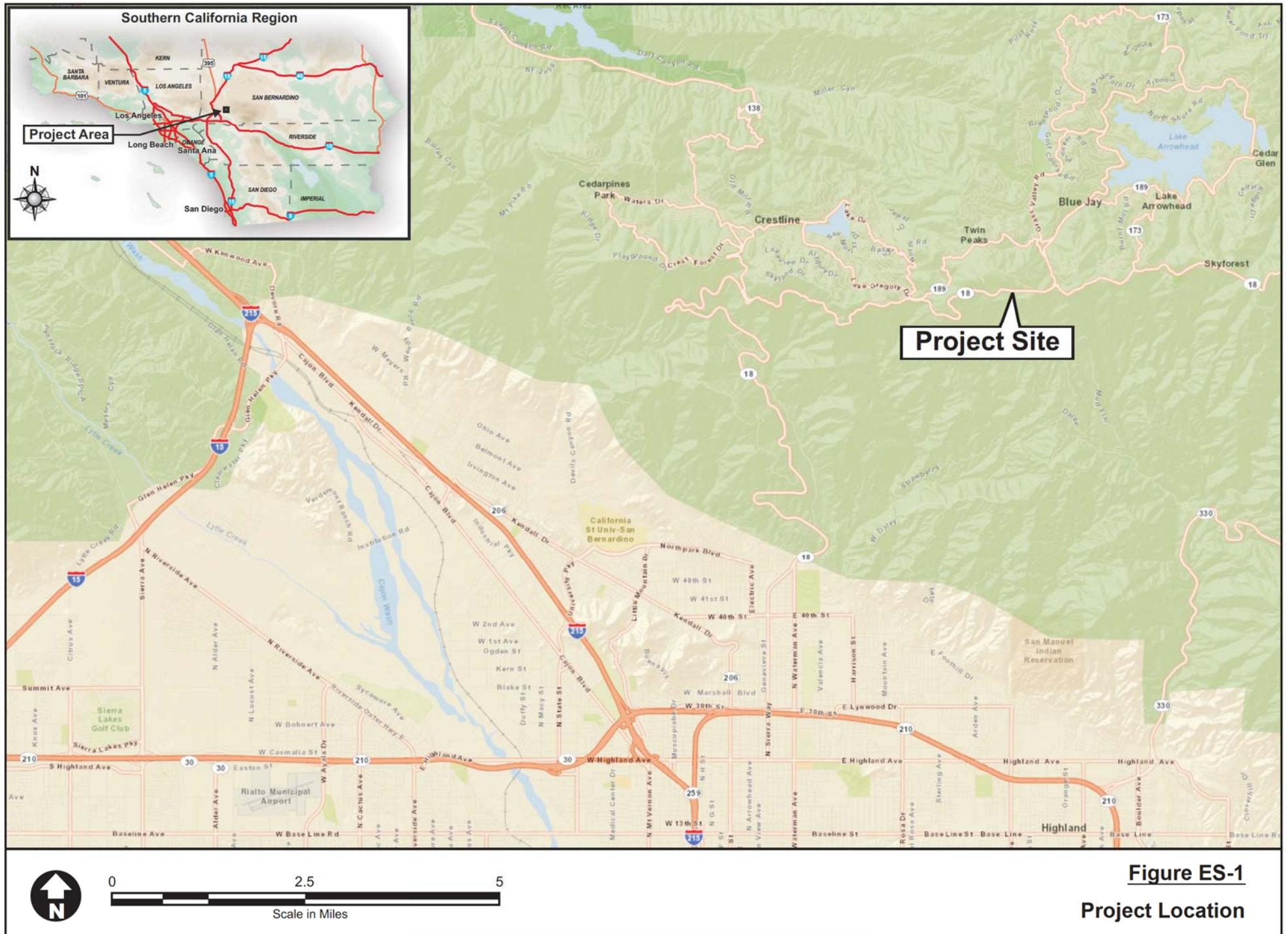


Figure ES-1
Project Location

In order to restore surface waters as proposed, the proposed project includes a series of channels, pipes, and attenuation basin(s). With development of the storm drain systems and attenuation basin(s), the proposed project would restore a total of approximately 100 acre-feet per year into Little Bear Creek (MBA, 2010). Primary elements of the project would be implemented in two distinct phases, described below.

Phase 1

Phase 1 of the proposed project would intercept the largest part of runoff to be restored under the proposed project, and result in a 64 percent reduction (in runoff) into the landslide area. Improvements constructed under this phase would convey mountainside runoff from an area of approximately 51 acres, and deliver this runoff to Little Bear Creek. This phase of the proposed project includes approximately 0.8 miles of flood control improvements, comprised of approximately 0.2 miles of channel/basin and approximately 0.6 miles of pipe culvert and appurtenances.

- *Channelized Reach(s)*. The proposed channel sections would be of varying width and depth and trapezoidal in configuration. Channelized reaches would be located near the inlet and outlet of the proposed basin(s) and would be armored to prevent erosion. The configuration of the channel sections will be determined by the SBCFCD and designed to be sufficient to convey the mountainside runoff and associated debris.
- *Culvert & Appurtenances*. The culvert system would be aligned along the north side of SR-18 extending from the west end of the community of Rimforest to the east end of the community discharging into the proposed basin via an inlet channel as described above, and would include street inlets to filter debris onto SR-18. Stormwater flows would be directed via the culvert/basin systems into Little Bear Creek. Currently, runoff into Little Bear Creek occurs from an area of approximately 40 acres north of SR-18; restoring runoff from a 50-acre area would therefore increase runoff into the creek.
- *Basin(s)*. Flow Attenuation basin(s) would be constructed within the Little Bear Creek channel, downstream of the point where flows restored by the culvert system described above would enter the drainage. This basin system would be designed to reduce peak storm flows discharging into Little Bear Creek, and would include a drain culvert and armored emergency spillway which would discharge to Little Bear Creek via an armored energy dissipater. The attenuation basin(s) are included in the Phase 1 design because downstream stormwater drainage structures in the Little Bear Creek channel would not have sufficient capacity to transmit peak flows with the additional runoff contributed by the restoration of flows as described above. Jurisdictional ephemeral and perennial but non-wetland waters of the State and federally jurisdictional “waters of the U.S.” will be defined on any property to be disturbed. The EIR will evaluate any of these areas that will be impacted by the proposed project. Any impacts to jurisdictional waters, wetlands, or riparian habitat associated with the proposed project would require authorization from the United States Army Corps of Engineers (USACE), SWRCB, RWQCB and the California Department of Fish and Wildlife (CDFW).

Phase 2 of the proposed project would restore runoff from 16 acres of the interior portion of the community of Rimforest and result in a 30 percent reduction in runoff to the landslide area. This phase includes installation of a culvert system to direct runoff from Pine Avenue, which runs parallel to the south of SR-18, and under SR-18 to join flows restored by Phase 1 in Little Bear Creek. The Phase 2 culvert system would include street inlets and storm drains within Rimforest to facilitate the diversion of flows along Pine Avenue. A culvert system would be installed through an existing lumber yard off Pine Avenue, connecting to the main culvert system along Pine Avenue. By restoring Pine Avenue runoff into Little Bear Creek, Phase 2 would restore an additional 100-year storm flow of 100 CFS.



Figure ES-2
Project Site Plan

The existing storm drain catch basins and pipes along Apache Trail would be left in place and would continue to convey a small amount of stormwater runoff through the community of Rimforest to the existing output location at the landslide area in southern Rimforest.

Construction of the proposed project would occur over three summer seasons (potentially 2017-2019):

- Phase 1-Basin Construction: May-September
- Phase 1-SR 18 Storm Drain: Following May-August
- Phase 2-Pine Ave. Storm Drain: Undetermined May-August

Air Quality calculations for the EIR are slightly conservative as they assume a schedule which has higher off-road equipment and on-road vehicle fleet average emissions factors.

ES.2 Environmental Review Process

The County prepared and transmitted a Notice of Preparation (NOP) for this EIR on May 22, 2015. Comments on the NOP were requested by no later than June 22, 2015. Eight comment letters on the NOP were received during the scoping period. The NOP is included as Appendix 1 of the original Draft EIR. The Draft EIR was released for agency and public review for the period between September 10, 2015 and October 26, 2015.

The review period for the Recirculated Draft EIR should generally be the same as the review period of the originally circulated EIR (CEQA Guidelines 15088.5[d], 15078[e]). In the case of an EIR submitted to the State Clearinghouse for review by State agencies, the review period must be at least 45 days (CEQA Guidelines 15105[a]). Therefore, the review period for this Recirculated Draft EIR is 45 days.

Publication of this Recirculated Draft EIR commences a 45-day public review period that ends on October 29, 2016 (CEQA Guidelines 15088.5[d], 15087[e], 15105[a]). The public is invited to comment on only those portions of the document that have been revised and included in this Recirculated Draft EIR; i.e. the Introduction, Biological Resources Analysis, Hydrology and Water Quality Analysis, Cumulative Effects Analysis for Biological Resources, and References for Biological Resources and Cultural Resources.

After the close of the public review period on October 29, 2016, the County will prepare a Final EIR that contains a response to each public agency, organization, and individual that commented during the initial circulation period that pertains to those portions of the EIR that were not recirculated, and all comments received during the recirculation period that pertain to the recirculated portions of the EIR (CEQA Guidelines 15088.5[f][2]). The County is the Lead Agency ensuring compliance of the proposed project with CEQA regulations. The Final EIR will be used by the County, in conjunction with other information developed in the County's formal record, to act on proposed project approval. Under CEQA requirements, the County will determine the adequacy of the Final EIR and, if adequate, will certify the document as complying with CEQA.

ES.3 Summary of Impacts and Mitigation Measures

Section 3 of the original Draft EIR presents the direct and indirect impacts associated with the proposed project, and Section 5 provides its incremental contribution to cumulative effects. The proposed project would result in 14 adverse impacts that can be mitigated to a level of less than significant (Class II). These impacts would be related to biological resources, cultural resources, geology and soils, hydrology and water quality, noise, and traffic and transportation, as summarized in Table ES-1 (located at the end of

this section). All other impacts associated with the proposed project's implementation would be less than significant (Class III) or beneficial (Class IV).

ES.3.1 Impacts Not Further Considered in this EIR

As discussed in Appendix 1 (Initial Study/Notice of Preparation, and Public Comments) of the original Draft EIR, the project was determined to have no impact or a less than significant impact with regard to the following impact thresholds, which are therefore not analyzed in the EIR.

Aesthetics

Construction of the proposed project would temporarily have an adverse effect on the scenic vista surrounding the project site due to construction activity and vehicles. However, construction is expected to occur over an approximately four-month-long period, and operation of the proposed project would not present permanent structures that would obstruct scenic views from SR-18. The removal of vegetation would not substantially change the scenic views from SR-18. Construction of the attenuation basin(s) would include the removal of trees and vegetation. However, the attenuation basin(s) would not be visible from SR-18, and the removal of trees to install the attenuation basin(s) would not alter scenic resources such as the view from the highway. Residential and commercial development is present along the proposed project site where the channel and pipeline would be constructed; therefore, the proposed project would not substantially degrade the visual quality and surroundings in this developed area. Construction of the attenuation basin(s) would require excavation, trenching, and the removal of trees, which would alter or degrade the existing visual character of the proposed project site. However, the proposed project would also include landscape buffers along the slopes of the attenuation basin(s), which would avoid substantial degradation of visual character of the site. No new sources of light or glare would be created for or by the proposed project. Therefore, the proposed project would have a less-than-significant impact on Aesthetics.

Agriculture and Forestry Resources

The proposed project is not located on or near Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Department of Conservation. There are no enrolled Williamson Act lands in the project area and the proposed project would not conflict with a Williamson Act contract. The project is not located on land which is zoned for forest land or timberland, and would not result in a significant conversion of forest land to non-forest use. The proposed project would also not convert Farmland to non-agricultural use, therefore the proposed project would have a less-than-significant impact on Agriculture and Forestry Resources.

Hazards and Hazardous Materials

The proposed project would not involve the routine transport, use, or disposal of hazardous materials. Any use of such materials during construction or operation of the proposed project would occur under best management practices (BMPs) to avoid accidental spill(s) or leak(s). This would not introduce a significant potential for hazard through the release of hazardous substances. The proposed project may require short term traffic control, however all closures would be coordinated with the relevant agencies to prevent access issues. Traffic for the proposed project would pass the Rim of the World High School, however, emissions associated with the traffic would be consistent with existing and future emissions from traffic along SR-18 and would not introduce a new impact associated with hazardous emissions in proximity to the high school. The proposed project would not be located on a hazardous materials site.

and would not create a significant hazard to the public or the environment. The proposed project is also not located within an airport land use plan, within two miles of an airport, or within the vicinity of a private airstrip. Construction of the proposed project would include the use of motorized vehicles and equipment in and adjacent to forest areas. Sparks of heat from engines could potentially result in the ignition of a wildland fire, however the proposed project would utilize standard safety measures and would not introduce a significant risk of wildland fire. Therefore, the proposed project would have a less-than-significant impact from hazards and hazardous materials.

Mineral Resources

The proposed project would not result in the availability of known mineral resources, as there are no producing sites within the region. No mineral resources have been identified in the County's 2007 General Plan or the Lake Arrowhead Community Plan at the project site or within the vicinity. Therefore, the proposed project will have no impact on mineral resources.

Paleontological Resources

The most useful designation for determining if paleontological resources are likely to be present in a project area is the "sensitivity" of the geologic units underlying the project. Sensitivity refers to the likelihood of finding significant fossils within a geologic unit. The colluvial and alluvial deposits and colluvial soils have low sensitivity based on their relative youthful age and/or their high-energy depositional history and are unlikely to produce important fossil remains. The granitic bedrock has zero sensitivity; zero sensitivity is assigned to crystalline rocks because they have no potential for producing fossil remains. The geologic units in the proposed project area have low to zero sensitivity, therefore there is a less than significant potential to damage or destroy paleontological resources.

Population and Housing

The proposed project would not generate a permanent increase in population levels or a decrease in available housing because construction would be performed by crews or contractors from the County of San Bernardino. No new jobs would be created during operation which would result in a population increase. The proposed project also would not displace housing because it is being located in an area of undeveloped forest land. Therefore, the proposed project would have no impact on population and housing.

Recreation

The proposed project would not result in short-term or long-term population growth which would result in an increased demand for recreational facilities. The proposed project also does not include the construction or expansion of recreational facilities. Therefore, the proposed project would have no impact on recreation.

Utilities and Service Systems

The proposed project would not generate any wastewater, and would not exceed any wastewater treatment requirements. Any water used for dust suppression would be obtained through existing fire hydrants and would not require additional water. All requirements and best management practices would be incorporated into the project and no new or expanded water or wastewater facilities would be required. The design of the proposed project would ensure that existing and projected stormwater flows would not require additional stormwater facilities. All solid waste generated during construction would be disposed of at appropriately permitted landfills and would be compliant with all regulations related to solid waste. In order to comply with federal, State, and local statutes and regulations related to solid waste, the construction contractor will be held accountable to comply with the SBCFCD Plans and Special

Provisions issued for this project as well as Caltrans Standard Specifications. Therefore, the proposed project would have a less-than-significant impact on utilities and service systems.

ES.3.2 Growth Inducing-Effects

Elimination of Obstacles to Population Growth

The elimination of either physical or regulatory obstacles to population growth is considered to be a growth-inducing impact. A physical obstacle to population growth typically involves the lack of critical public service infrastructure. The extension of critical public service infrastructure, including roadways, water mains, and sewer lines, into areas that currently do not have these services is expected to support new development. However, the proposed project would not remove any obstacle to growth as it does not include the extension of any critical public service infrastructures. While the project does include the extension of runoff and stormwater infrastructure, these services would restore the direction of existing flows in order to mediate ongoing erosion and landsliding hazards which pose significant risk to property and the public in southern Rimforest. This would remove an obstacle to population growth in the community of Rimforest; however, this community is already fairly developed. Therefore, while the proposed project could potentially remove an obstacle to growth, it would not be considered growth-inducing.

Promotion of Economic Growth

The proposed project would result in direct economic impacts to the County through employment and the local purchase of some construction materials, as well as secondary impacts from the purchases of goods and services by those employed to construct the proposed project. The project does not include any residential or commercial development. Approximately 10 workers on average would be required to construct the project (most of whom are expected to reside in the County), and construction would be completed over three summer seasons (2017-2019). Maintenance of the storm drain after completion of the proposed project would be performed by County operation and maintenance employees every 3-5 years with approximately quarterly cleaning of catch basin(s) and storm drains and would not require additional staffing. Therefore, the proposed project would not result in increased population or employment in the project area, and would not be considered growth inducing.

ES.3.3 Irreversible Commitment of Resources

Implementation of the proposed project includes the construction and maintenance of a series of drainage facilities and a storm drain system to address historic erosion and landsliding in the southern Rimforest community. Nonrenewable energy resources would be committed during construction of the proposed project. This includes the use of fossil fuels and energy required for the attenuation basin(s) and culvert construction and associated activities, including earthen material and grading activities. Once completed, operation and maintenance activities would be limited to periodic inspections, vegetation control in the surrounding areas, debris and trash removal, and erosion and slope repair as needed. Therefore, an irreversible commitment of very small amounts of nonrenewable energy resources would occur.

Construction and operation of the proposed project would contribute to the incremental depletion of resources, including renewable and non-renewable resources. Non-renewable resources, such as natural gas, petroleum products, asphalt, petrochemical construction materials, steel, copper, and other metals, rock, and sand and gravel are considered to be commodities that are available in a finite supply. The

processes that created these resources occur over a long period. Therefore, replacement of these resources would not occur over the life of the project.

The demand for all such resources is expected to increase regardless of whether or not the project is developed. Forecasts of increases in population would directly result in the need for more public, commercial, and residential facilities in order to provide the needed services associated with this growth. If not consumed by this project, these resources would likely be committed to other projects in the region intended to meet this anticipated growth. Therefore, the proposed project would not increase energy consumption above what population growth itself would do. No increases in inefficiencies or unnecessary energy consumption are expected to occur as a direct or indirect consequence of the proposed project.

Furthermore, the investment of resources in the project would provide a community benefit by addressing historic erosion and landsliding in the southern Rimforest community. Mitigation measures have been included in this EIR to reduce and minimize project-specific and cumulative impacts.

ES.3.4 Irreversible Damage from Environmental Accidents

The proposed project proposes no uniquely hazardous uses, and its operation would not be expected to cause environmental accidents that would affect other areas. The project site is located within a seismically active region and would be exposed to ground shaking during a seismic event. The project is not located on or crossing a known Alquist-Priolo zoned fault. Two potentially active faults are located within the project vicinity, the Waterman Canyon fault and the Rimforest fault. The Waterman Canyon fault (also referred to as the Devils Canyon fault) is a potentially north dipping reverse fault and is located approximately 0.6 miles south of the proposed project (USGS, 2003; SCEDC, 2015). The Rimforest fault zone crosses the edge of the southeast corner of the proposed project in an area of proposed grading and the southern end of the proposed access road. However, the fault does not cross any pipeline or attenuation basin structures, and would not cause any significant damage to project structures in the event of fault rupture. With regard to accidental spills, the Stormwater Pollution Prevention Plan (SWPPP) prepared for the project would provide BMPs to ensure potential contaminants used during construction (e.g., fuel, lubricants, sealants) would be stored away from areas where they could potentially affect water quality, and would provide measures for managing flows during accidental spills or storm events. Implementation of the SWPPP requirements would ensure that impacts during construction would not be significant.

ES.4 Summary of Alternatives Analysis

Section 4 (Alternatives) of the original Draft EIR provides a description of the feasible project alternatives that meet the CEQA criteria and have been retained for the EIR's alternatives analysis. The alternatives analysis also includes a discussion of alternatives that were dismissed from further consideration, and a comparison of all alternatives evaluated. The following alternatives have been included in the analysis:

Alternative 1 (No Project Alternative)

Under the No Project Alternative, the County would not construct and maintain a series of drainage facilities to address historic erosion and landsliding in the southern Rimforest community. The proposed restoration of the existing drainage patterns away from southern Rimforest and towards the north into Little Bear Creek would not occur. The project objective would not be achieved. The environmental impacts associated with slope instability and landsliding would be substantially greater for most environmental issue areas including biological resources, geology and soils, hazards and hazardous

materials, hydrology and water quality, and land use. Remedial activities that would be required to repair damage from erosion and landslides would further increase impacts to these topics and would have impacts under additional topics such as air quality, noise, and traffic and transportation.

Alternative 2 (Divert Runoff into Daley Creek Watershed)

Alternative 2 would divert the runoff southerly into a canyon east of Rimforest and south of Highway 18. As with the proposed project, this alternative would consist of three construction phases. Phase 1 of Alternative 2 would differ from that of the proposed project because the discharge runoff would be diverted through a weir outlet structure into an unnamed tributary to West Fork City Creek (sometimes referred to as Daley Creek), which would cause erosion at and below the discharge point. The flow would cross the existing Daley trail approximately 1,000 feet below the discharge point. No structures would be affected, but this action would require permission from the U.S. Forest Service. Similar to the proposed project, Phase 2 would drain approximately 16 acres of the interior part of Rimforest, reducing an additional 30 percent of runoff, by construction of a storm drain system along SR-18 and Pine Avenue.

Environmentally Superior Alternative

Based on the analysis contained in Sections 3 (Environmental Setting, Analysis, and Mitigation Measures) and 4 (Alternatives) of this EIR, the proposed project is the environmentally superior alternative. Although the majority of impacts would be reduced under Alternative 2 (see Table 4-1), due to the serious potential to create/trigger a new retrogressing landslide area, Alternative 2 was not considered to be feasible from a geotechnical standpoint and would result in a significant and unavoidable impact.

ES.5 Areas of Controversy and Issues to be Resolved

Evaluation of the proposed project under CEQA was initiated in May 2015. As of the publication of this Recirculated Draft EIR, no areas of controversy or issues in need of resolution have been communicated to the San Bernardino County Department of Public Works. Additionally, there are no remaining technical project description issues or environmental review issues left to be resolved.

Table ES-1. Summary of Impacts and Mitigation Measures

Issue Area	Impact Number	Impact Summary	Mitigation Measure(s)	Level of Significance
Air Quality	N/A	Cumulative Impacts	<ul style="list-style-type: none"> • AQ-1: Off-road Equipment Emissions Control • AQ-2: On-road Equipment Emissions Control 	Class I – Significant and Unavoidable
Biological Resources	BIO-1	Construction activities would result in adverse effects to species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS	<ul style="list-style-type: none"> • MM BIO-1a: Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas • MM BIO-1b: Pre-construction Surveys and Construction Monitoring • MM BIO-1c: Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss • MM BIO-1d: Prevent Invasive Weed Introduction • MM BIO-1e: Speed Limit • MM BIO-1f: Personnel Training • MM BIO-1g: Nest and Den Avoidance • MM BIO-1h: Avoid Wildlife Hazards and Entrapment • MM BIO-1i: Manage Project Trash • MM BIO-1k: Minimization and Avoidance Measures for Southern Rubber Boa • MM BIO-1l: Fugitive Dust Control 	Class II – Less than Significant with Mitigation
	BIO-2	Construction activities would result in adverse effects to riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS	<ul style="list-style-type: none"> • MM BIO-1a: Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas • MM BIO-1b: Pre-construction Surveys and Construction Monitoring • MM BIO-1c: Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss • MM BIO-1d: Prevent Invasive Weed Introduction • MM BIO-1e: Speed Limit • MM BIO-1f: Personnel Training • MM BIO-1l: Fugitive Dust Control 	Class II – Less than Significant with Mitigation

Table ES-1. Summary of Impacts and Mitigation Measures

Issue Area	Impact Number	Impact Summary	Mitigation Measure(s)	Level of Significance
	BIO-3	Construction activities could result in a substantial adverse effect on federally protected wetlands as defined by Section 404, of the Clean Water Act through direct removal, filling, hydrological interruption, or other means	<ul style="list-style-type: none"> • MM BIO-1a: Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas • MM BIO-1b: Pre-construction Surveys and Construction Monitoring • MM BIO-1c: Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss • MM BIO-1d: Prevent Invasive Weed Introduction • MM BIO-1e: Speed Limit • MM BIO-1f: Personnel Training • MM BIO-1i: Fugitive Dust Control 	Class II – Less than Significant with Mitigation
	BIO-4	Construction activities will have impacts to wildlife movement of native wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	None required	Class III – Less than Significant
	BIO-5	Construction activities may conflict with local policies or ordinances protecting biological resources	None required	Class III – Less than Significant
	CUL-1	Construction, operation, and maintenance of the proposed project would demolish, destroy, relocate, or disturb the cultural resource in a manner that would diminish its integrity or materially impair the significance of the resource	<ul style="list-style-type: none"> • MM CUL-1a: Construction monitoring • MM CUL-1b: Treatment of previously unidentified cultural resources 	Class II – Less than Significant with Mitigation
	CUL-2	Construction, operation, and maintenance of the proposed project could uncover, expose, and/or damage human remains	• MM CUL-1: Incidental Discovery of Historical Resources or Archaeological Resources	Class II – Less than Significant with Mitigation
Geology & Soils	G-1	Project structures could be damaged by surface fault rupture	None required	Class III – Less than Significant
	G-2	Strong to very strong earthquake-induced ground shaking could result in damage to project structures and/or injury to people	• MM G-1: Geotechnical Evaluation and Design for Ground Shaking	Class II – Less than Significant with Mitigation
	G-3	Seismically induced landslides could damage project structures or expose people to injury	None required	Class III – Less than Significant
	G-4	Project structures could be damaged by seismically induced liquefaction phenomena	• MM G-2: Geotechnical Evaluation and Design for Liquefaction	Class II – Less than Significant with Mitigation

Table ES-1. Summary of Impacts and Mitigation Measures

Issue Area	Impact Number	Impact Summary	Mitigation Measure(s)	Level of Significance
	G-5	Expose people or structures to potential risk from landslides	<ul style="list-style-type: none"> • MM G-3: Conduct Geotechnical Surveys for Landslides and Unstable Slopes 	Class II – Less than Significant with Mitigation
	G-6	Construction could trigger or accelerate soil erosion	None required	Class III – Less than Significant
	G-7	Unsuitable soils result in damage to project structures	None required	Class III – Less than Significant
Hydrology & Water Quality	HYD-1	Construction, operation, and maintenance of the proposed project would degrade water quality and violate water quality standards or waste discharge requirements	<ul style="list-style-type: none"> • MM HYD-1: Attenuation basin to be no larger than necessary and designed to mimic downstream hydrology and sediment transport 	Class II – Less than Significant with Mitigation
	HYD-2	Construction and operation of the proposed project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge	None required	Class III – Less than Significant
	HYD-3	Construction and operation of the proposed project would result in substantial erosion, siltation, and mudflow due to alteration of the existing drainage pattern	None required	Class IV – Beneficial Impact
	HYD-4	Construction and operation of the proposed project would result in flooding on- or off-site or would exceed the capacity of existing or planned stormwater drainage facilities due to alteration of the existing drainage pattern	None required	Class III – Less than Significant
Land Use and Planning	LU-1	The project could conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project	None required	Class III – Less than Significant
	LU-2	Construction of the project could preclude an existing or permitted land use, or create a disturbance that would diminish the function of a particular land use	<ul style="list-style-type: none"> • MM N-1: Construction Noise Complaint Response • MM TRA-1: Prepare a construction area traffic control plan or detour plan. • MM TRA-2: Notify affected property owners and tenants 	Class II – Less than Significant with Mitigation
	LU-3	Operation and maintenance of the project could preclude an existing or permitted land use, or create a disturbance that would diminish the function of a particular land use	None required	Class III – Less than Significant
Noise	N-1	Noise from construction or maintenance activities would occur outside of the hours allowed by the County of San Bernardino Development Code	None required	Class IV – Beneficial Impact

Table ES-1. Summary of Impacts and Mitigation Measures

Issue Area	Impact Number	Impact Summary	Mitigation Measure(s)	Level of Significance
	N-2	Noise from construction activities would result in a temporary increase (more than 5 dBA Leq) over the lowest hourly ambient levels at sensitive receptors	<ul style="list-style-type: none"> • MM N-1: Construction Noise Complaint Response 	Class II – Less than Significant with Mitigation
Public Services	PS-1	Construction, operation, and maintenance of the proposed project would place a demand on public services that would adversely affect the maintenance of acceptable service ratios, response times, or other performance objectives	None required	Class III – Less than Significant
Traffic & Transportation	TRA-1	Construction of the proposed project would conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel	<ul style="list-style-type: none"> • MM TRA-1: Prepare a construction area traffic control plan or detour plan • MM TRA-2: Notify affected property owners and tenants • MM TRA-3: Coordinate with MARTA 	Class II – Less than Significant with Mitigation
	TRA-2	Construction of the proposed project would conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways	None required	Class III – Less than Significant
	TRA-3	Construction of the proposed project would substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	<ul style="list-style-type: none"> • MM TRA-1: Prepare a construction area traffic control plan or detour plan • MM TRA-2: Notify affected property owners and tenants • MM TRA-3: Coordinate with MARTA 	Class II – Less than Significant with Mitigation
	TRA-4	Construction of the proposed project would result in inadequate emergency access	<ul style="list-style-type: none"> • MM TRA-4: Coordinate with Emergency Service Providers 	Class II – Less than Significant with Mitigation
	TRA-5	Construction of the proposed project would conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities	<ul style="list-style-type: none"> • MM TRA-1: Prepare a construction area traffic control plan or detour plan • MM TRA-2: Notify affected property owners and tenants • MM TRA-3: Coordinate with MARTA 	Class II – Less than Significant with Mitigation
	TRA-6	Operation of the proposed project would conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel	None required	Class III – Less than Significant

1. Introduction

1.1 Purpose of the EIR

The County of San Bernardino, Department of Public Works (County) proposes to construct the Rimforest Storm Drain Project (proposed project). The proposed project involves construction and maintenance of a series of drainage facilities to address historic erosion and landsliding in the southern Rimforest community. The San Bernardino County Flood Control District (SBCFCD), a separate legal entity, is acting in an advisory capacity to the County for this project.

This Recirculated Draft Environmental Impact Report (EIR) has been prepared pursuant to the requirements of the California Environmental Quality Act (CEQA). The County is the lead agency under CEQA. CEQA requires the lead agency to consider the information contained in an environmental review document, prior to taking any discretionary action. This Recirculated Draft EIR will serve as an informational document in addition to the original Draft EIR to be considered by the County and other local and state permitting agencies during their respective processing of the proposed project.

The Recirculated Draft EIR for the proposed project has been prepared to inform the public of changes to the original document resulting from additional analysis for biological resources and hydrology and water quality. A downstream habitat and flow assessment for Strawberry Creek and Lower East Twin Creek was completed to more accurately characterize potential effects, downstream from the proposed project. Results from this assessment have been included in the Recirculated Draft EIR. Additionally, corrections have been made to the construction schedule and a few references in the original cultural resources Draft EIR section.

The Recirculated Draft EIR contains an updated Project Description (Section 2), air quality section (3.2), biological resources analysis (Section 3.3), cultural resources section (Section 3.4), hydrology and water quality analysis (Section 3.6), Cumulative Effects section (Section 5), Other CEQA Considerations section (Section 6), and an updated References section (Section 7). No changes to impact conclusions have occurred based on the additional analyses performed. Only those sections that have changed from the original Draft EIR published in September 2015 are included in this Recirculated Draft EIR, per CEQA Guidelines 15088.5(c).

1.2 Public Noticing Requirements

Notice of the Recirculated Draft EIR must be given in the same manner as notice of the previously circulated Draft EIR (CEQA Guidelines 15088.5[d]). Accordingly, notice of this Recirculated Draft EIR will be provided to all organizations and individuals who previously requested notice in writing, and by at least one of the methods specified in CEQA Guidelines 15087(a); i.e., publication in a newspaper of general circulation, posting, and/or direct mailing to neighboring property owners. All of the noticing procedures set forth in CEQA Guidelines 15087 for circulation of a Draft EIR will be complied with for the Recirculated Draft EIR as well. Additionally, the Lead Agency will provide notice to every agency, person, or organization that commented on the original EIR.

1.3 Public Review Period Requirements

The review period for the Recirculated Draft EIR should generally be the same as the review period of the originally circulated EIR (CEQA Guidelines 15088.5[d], 15078[e]). In the case of an EIR submitted to the State Clearinghouse for review by State agencies, the review period must be at least 45 days (CEQA Guidelines 15105[a]). Therefore, the review period for this Recirculated Draft EIR is 45 days.

1.4 Recirculated Draft EIR Environmental Review Process

Publication of this Recirculated Draft EIR commences a 45-day public review period that ends on October 29, 2016 (CEQA Guidelines 15088.5[d], 15087[e], 15105[a]). The public is invited to comment on only those portions of the document that have been revised and included in this Recirculated Draft EIR; i.e. the Introduction, Biological Resources Analysis, Hydrology and Water Quality Analysis, Cumulative Effects Analysis for Biological Resources, and References for Biological Resources and Cultural Resources.

1.5 Decision-Making Process

After the close of the public review period on October 29, 2016, the County will prepare a Final EIR that contains a response to each public agency, organization, and individual that commented during the initial circulation period that pertains to those portions of the EIR that were not recirculated, and all comments received during the recirculation period that pertain to the recirculated portions of the EIR (CEQA Guidelines 15088.5[f][2]). The County is the Lead Agency ensuring compliance of the proposed project with CEQA regulations. The Final EIR will be used by the County, in conjunction with other information developed in the County's formal record, to act on proposed project approval. Under CEQA requirements, the County will determine the adequacy of the Final EIR and, if adequate, will certify the document as complying with CEQA.

1.6 Recirculated Draft EIR Organization

This Recirculated Draft EIR contains the following sections, which are organized as follows:

- **Executive Summary.** Provides a description of the proposed project's environmental review process, a summary of the proposed project attributes and its impacts, a brief description of the proposed project's alternatives and identification of the environmentally superior alternative, and a summary of the proposed project's areas of known controversy and issues in need of resolution.
- **Section 1.0 – Introduction** contains a summary of the purpose and scope of the Recirculated Draft EIR, and the reason why the document is being prepared.
- **Section 2.0 – Project Description** provides details on the proposed project, including the general environmental setting, construction plan, operation and maintenance, required permits and approvals, and environmental commitments to minimize impacts
- **Section 3.0 – Environmental Setting, Analysis, and Mitigation Measures** details environmental setting information, applicable regulations and standards, proposed project impacts, and proposed mitigation measures for the resource areas that have been updated from the original Draft EIR. Resource-specific analyses are included in the following sections:
 - 3.2 – Air Quality and Greenhouse Gases
 - 3.3 – Biological Resources
 - 3.4 – Cultural Resources
 - 3.6 – Hydrology and Water Quality
- **Section 5.0 – Cumulative Effects** provides a description of the current and reasonably foreseeable projects located in the vicinity of the proposed project, and the cumulative effects of these projects in combination with the proposed project. This section has been included due to updates to the biological resources section.

- **Section 6.0 – Other CEQA Considerations** addresses other applicable CEQA requirements, including an analysis of growth-inducing effects, significant irreversible commitment of resources, and significant effects that cannot be avoided.
- **Section 7.0 – References** lists all of the informational references cited in this EIR. This section is being included due to updates to the biological and cultural resources references.

2. Project Description

2.1 Project Overview

The County of San Bernardino (County), proposes to construct and maintain a series of drainage facilities to address historic erosion and landsliding in the southern Rimforest community. The remediation approach (proposed project) developed to address slope stability issues, includes restoring drainage runoff from north of Highway 18 into Little Bear Creek, which drains to Lake Arrowhead. In order to restore this flow pattern without increasing peak runoff downstream of Highway 18, the County proposes a detention basin to attenuate runoff. The San Bernardino County Flood Control District (District), a separate legal entity, is acting in an advisory capacity to the County for this project.

Phase 1 of the proposed project would intercept the largest part of runoff to be restored under the proposed project, and result in a 64 percent reduction in runoff into the landslide area. Improvements constructed under this phase would convey mountainside runoff from an area of approximately 51 acres, and deliver this runoff to Little Bear Creek. This phase of the proposed project includes approximately 0.8 miles of flood control improvements, comprised of approximately 0.2 miles of channel/basin and approximately 0.6 miles of pipe culvert and appurtenances.

Phase 2 of the proposed project would restore the direction of runoff from 16 acres of the interior portion of the community of Rimforest and result in a 30 percent reduction in runoff into the landslide area. This phase includes installation of a culvert system to direct runoff from Pine Avenue, which runs parallel to the south of SR-18, and under SR-18 to join flows restored by Phase 1 in Little Bear Creek. The Phase 2 culvert system would include street inlets and storm drains within Rimforest to facilitate the routing of flows along Pine Avenue.

A development proposed by the Church of the Woods (COTW) is located in the northeastern area of the community of Rimforest, on the north side of SR-18, and the drainage output point for the proposed project is located on the COTW property. The Church of the Woods (COTW) development also proposes to implement stormwater drainage improvements along Little Bear Creek, including construction of culvert system that would initiate at an existing storm drain at the southwestern corner of the COTW site (PCR, 2010); this is the same area where flows associated with the proposed project would enter the COTW property, via the Pine Avenue culvert system described above. The COTW proposed culvert system would route through the property along the same alignment as the Little Bear Creek drainage and an existing sewer line, also generally parallel to a proposed COTW sewer alignment (PCR, 2010). Approximately midway through the COTW site, the new culvert system would discharge into the Little Bear Creek drainage and flow northeasterly through the property (PCR, 2010). Due to the location of the proposed project's discharge point at the southwestern portion of the COTW property, it is reasonably anticipated that flows associated with the proposed project would be transmitted through the COTW conveyance system described above, discharging into the proposed project's attenuation basin(s) within Little Bear Creek.

The existing storm drain catch basins and pipes along Apache Trail would be left in place and would continue to convey a small amount of stormwater runoff through the community of Rimforest to the existing output location at the landslide area in southern Rimforest.

2.2 Environmental Setting

As shown in Figure 1, the proposed project is located in the community of Rimforest, in the San Bernardino Mountains near Lake Arrowhead, approximately six miles north of the City of San Bernardino in the County of San Bernardino, California. Surrounding land uses and project site specifics are provided below.

Rimforest Storm Drain Project
PROJECT DESCRIPTION

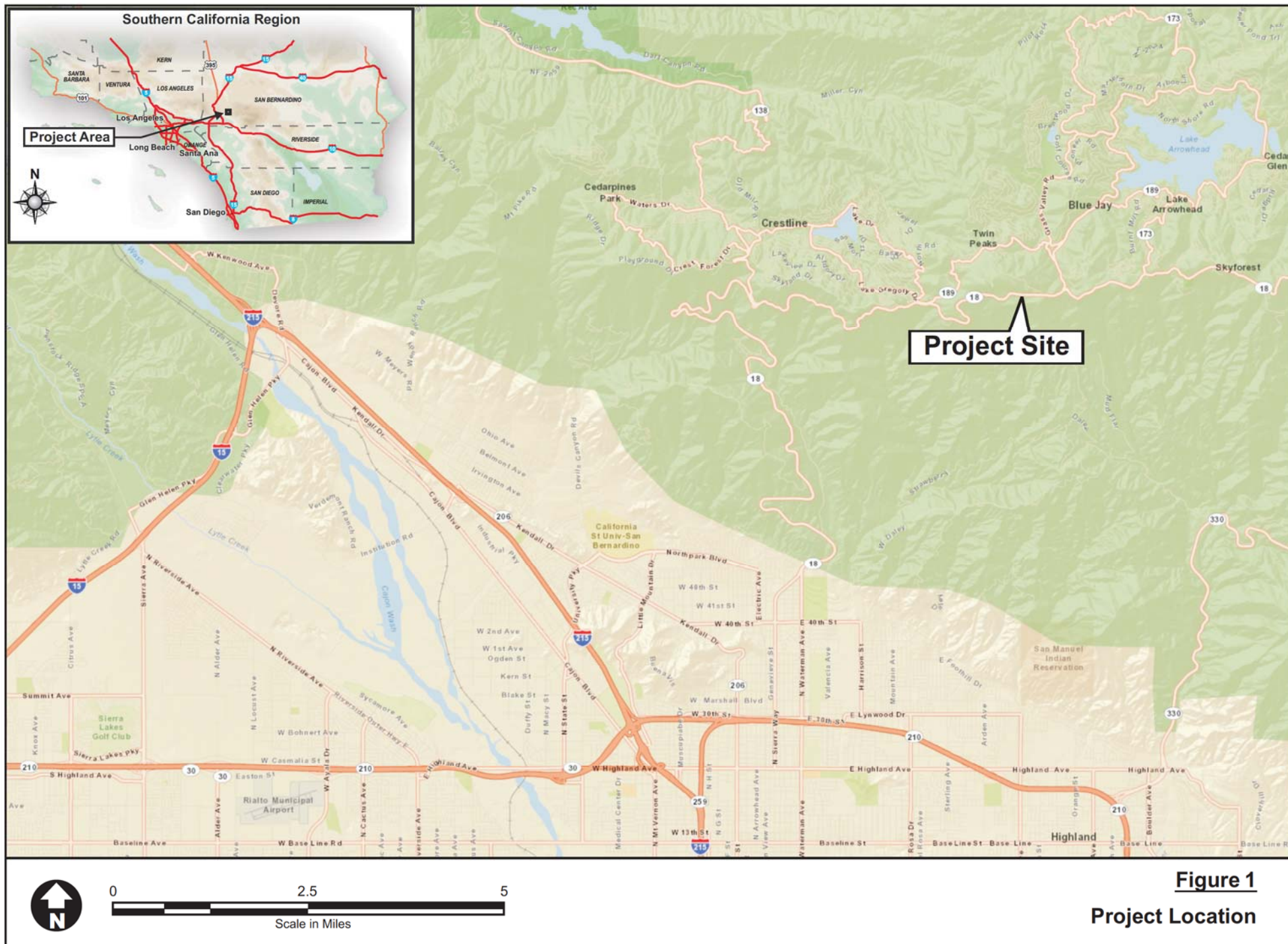


Figure 1
Project Location

Rimforest is an unincorporated community in the San Bernardino Mountains of San Bernardino County, California. State Route 18 (SR-18) runs through the community. Residential development and commercial uses are located south of SR-18, within the community of Rimforest, and residential development is also located to the north. Directly south of the residential uses in the community is the San Bernardino National Forest, which is federal land and will remain undeveloped. There are few developed recreational facilities in the proposed project area. A majority of the land to the immediate south of Rimforest is eroding cliff-side, a result of runoff that most likely used to drain into Little Bear Creek being directed over the hillside towards Strawberry Creek. Rim of the World High School is located approximately one mile to the east of the community of Rimforest.

The headwaters of Little Bear Creek drain from the northeastern vicinity of Rimforest, through the communities of Blue Jay and Lake Arrowhead, and into the Lake Arrowhead Reservoir. In addition, the headwaters of Strawberry Creek drain from the southern vicinity of Rimforest, into City Creek, and eventually terminate at the Santa Ana River. The Strawberry Creek watershed is part of the larger watershed of the Santa Ana River, which is within the safe yield of the San Bernardino Valley Municipal Water District (SBVMWD), meaning that the SBVMWD holds water rights to this drainage area. (Bonadiman, 2010a)

Pine Avenue runs parallel to the south of SR-18. Blackfoot Trail West runs in a north-south alignment through the western portion of Rimforest, between Pine Avenue and the landslide area in southern Rimforest. Apache Trail connects to Blackfoot Trail West approximately 250 feet south of Pine Avenue, and continues to the east then south, towards the landslide area in southern Rimforest.

2.3 Proposed Project

The proposed project would restore runoff from its current flow-path through the community of Rimforest and outlet at the landslide area in southern Rimforest, into a new flow-path comprised of channels and pipeline to the north of SR-18, with an outlet into Little Bear Creek on the COTW property. Please see Figure 2 for a site plan. In re-directing this runoff, the proposed project would result in runoff flowing into the Mojave River Watershed instead of the Santa Ana River Watershed; as described in Section A.1 (Background), based on available evidence it is believed this was the historic drainage direction, prior to construction of SR-18 and establishment of the community of Rimforest. The restoration of runoff between watersheds may require approval of the SBVMWD and the State Water Resources Control Board (SWRCB), as well as the Santa Ana River Regional Water Quality Control Board (RWQCB), which has jurisdiction over the Santa Ana River Watershed, and the Lahontan RWQCB, which has jurisdiction over the Mojave River Watershed (Bonadiman, 2010). The need for a water rights transfer petition will be determined by the SWRCB prior to the commencement of construction for the proposed project.

Downstream of the point where the proposed project would contribute flows to Little Bear Creek, the creek continues in a series of stormwater conveyance features through the unincorporated communities of Blue Jay and Lake Arrowhead, terminating at Lake Arrowhead Reservoir. Within the community of Blue Jay, an existing maintenance yard owned and operated by the County Department of Public Works (DPW) is located within the Little Bear Creek drainage; this maintenance yard is referred to as the Blue Jay Maintenance Yard. The maintenance yard is currently equipped with a three-foot-wide storm ditch



0 490 980
Feet



— Phase 1
— Phase 2

Figure 2
Project Site Plan

to transmit flow in Little Bear Creek through the facility and through a pipe beneath the highway. The maintenance yard conveyance system may be inadequate to contain existing storm flows, as asphalt within the yard appears to be damaged by water-related cracking, which occurs when water seeps to the asphalt base, causing the base to soften and form cracks which penetrate the surface, eventually leading to potholes. Therefore, in order to avoid damage to the Blue Jay Maintenance Yard conveyance system and other facilities along Little Bear Creek, the proposed project would include attenuation basins on a property currently owned by the COTW, near the proposed project's output point into Little Bear Creek. These basins, described further below, would slow the rate of stormwater flows in Little Bear Creek.

As mentioned, Little Bear Creek terminates at the Lake Arrowhead Reservoir. The current water supplier for Lake Arrowhead is the Lake Arrowhead Community Services District (LACSD), which presently purchases Feather River water from the SBVMWD, which is then transferred through Crestline Lake Arrowhead Water Agency (CLAWA). The proposed project would result in approximately 100 more acre-feet per year (afy) of water in Lake Arrowhead, potentially available for treatment and distribution by the LACSD (Bonadiman, 2010). This additional annual inflow would represent a very small portion of Lake Arrowhead's 48,000 acre-foot storage capacity (DWR, 2014).

In order to restore surface waters as proposed, the proposed project includes a series of channels, pipes, and attenuation basins. With development of the storm drain systems and attenuation basin(s), the proposed project would restore a total of approximately 100 acre-feet per year into Little Bear Creek (MBA, 2010). Primary elements of the project would be implemented in two distinct phases, described below.

Phase 1

Phase 1 of the proposed project would intercept the largest part of runoff to be restored under the proposed project, and result in a 64 percent reduction (in runoff). Improvements constructed under this phase would convey mountainside runoff from an area of approximately 51 acres, and deliver this runoff to Little Bear Creek. This phase of the proposed project includes approximately 0.8 miles of flood control improvements, comprised of approximately 0.2 miles of channel/basin and approximately 0.6 miles of pipe culvert and appurtenances.

- *Channelized Reach(s)*. The proposed channel sections would be of varying width and depth and trapezoidal in configuration. Channelized reaches would be located near the inlet and outlet of the proposed basin(s) and would be armored to prevent erosion. The configuration of the channel sections will be determined by the SBCFCD and designed to be sufficient to convey the mountainside runoff and associated debris.
- *Culvert & Appurtenances*. The culvert system would be aligned along the north side of SR-18 extending from the west end of the community of Rimforest to the east end of the community discharging into the proposed basin via an inlet channel as described above, and would include street inlets to filter debris onto SR-18. Stormwater flows would be directed via the culvert/basin systems into Little Bear Creek. Currently, runoff into Little Bear Creek occurs from an area of approximately 40 acres north of SR-18; restoring runoff from a 50-acre area would therefore increase runoff into the creek.
- *Basin(s)*. Flow Attenuation basin(s) would be constructed within the Little Bear Creek channel, downstream of the point where flows restored by the culvert system described above would enter the drainage. This basin system would be designed to reduce peak storm flows discharging into Little

Bear Creek, and would include a drain culvert and armored emergency spillway which would discharge to Little Bear Creek via an armored energy dissipater. The retarding attenuation basin(s) are included in the Phase 1 design because downstream stormwater drainage structures in the Little Bear Creek channel would not have sufficient capacity to transmit peak flows with the additional runoff contributed by the restoration of flows as described above. Jurisdictional ephemeral and perennial but non-wetland waters of the State and federally jurisdictional “waters of the U.S.” will be defined on any property to be disturbed. The EIR will evaluate any of these areas that will be impacted by the proposed project. Any impacts to jurisdictional waters, wetlands, or riparian habitat associated with the proposed project would require authorization from the United States Army Corps of Engineers (USACE), SWRCB, RWQCB and the California Department of Fish and Wildlife (CDFW).

Phase 2 of the proposed project would restore runoff from 16 acres of the interior portion of the community of Rimforest and result in a 30 percent reduction in runoff to the landslide area. This phase includes installation of a culvert system to direct runoff from Pine Avenue, which runs parallel to the south of SR-18, and under SR-18 to join flows restored by Phase 1 in Little Bear Creek. The Phase 2 culvert system would include street inlets and storm drains within Rimforest to facilitate the diversion of flows along Pine Avenue. A culvert system would be installed through an existing lumber yard off Pine Avenue, connecting to the main culvert system along Pine Avenue. By restoring Pine Avenue runoff into Little Bear Creek, Phase 2 would restore an additional 100-year storm flow of 100 CFS. After a confluence with the Phase 1 flow into Little Bear Creek, the unregulated peak 100-year flow into Little Bear Creek would be approximately 500 CFS. However, the attenuation basin(s) that are part of the proposed project would reduce this peak flow into Little Bear Creek to approximately 139 CFS, less than the current 100-year peak flow rate of 167 CFS (Bonadiman, 2010).

The existing storm drain catch basins and pipes along Apache Trail would be left in place and would continue to convey a small amount of stormwater runoff through the community of Rimforest to the existing output location at the landslide area in southern Rimforest.

2.3.1 Construction Plan

Schedule. Construction of the proposed project would occur over three summer seasons (potentially 2017-2019):

- Phase 1-Basin Construction: May-September
- Phase 1-SR 18 Storm Drain: Following May-August
- Phase 2-Pine Ave. Storm Drain: Undetermined May-July

Air Quality calculations for the EIR are slightly conservative as they assume a schedule which has higher off-road equipment and on-road vehicle fleet average emissions factors.

Hours of operation during construction would be limited to daylight hours between 6:00 a.m. and 5:00 p.m., Monday through Friday. No construction activities would occur during holidays and snow months. Construction work at night would only occur by special permission. The integrated construction schedule showing the estimated dates for each of the construction sub phases is provided in Appendix 2 (Air Pollutant Emissions Calculations).

Earth Disturbance. Earth-disturbing activities would occur during construction of the proposed project in order to install the proposed project features described above. Table 2-1 provides a list of the types of

earth-disturbing activities required during construction of the proposed project, and the estimates of the associated quantities of materials required or handled.

Table 2-1. Construction – Materials Quantities

Project Phase	Activity / Material	Quantity
Attenuation/Sediment Basin	Sewer relocation/sewer pipe	2,000 linear feet
	Excavation/dirt	60,000 cubic yards*
	Hauling/dirt export	15,000 cubic yards
	Culvert construction/culvert length	500 linear feet
	Embankment earth moving/dirt	30,000 cubic yards
	Concrete structures/concrete	500 cubic yards
	Rock placement/rock	4,000 cubic yards
	Paving/asphalt	1,250 tons
SR 18 Drain	Asphalt removal/asphalt	5,000 square yards (2,500 tons)
	Pipe installation/pipe	3,800 linear feet
	Hauling/dirt export	10,200 tons
	Concrete structures/concrete	120 cubic yards
	Paving/asphalt	2,500 tons
Pine Avenue Drain	Asphalt removal/asphalt	5,000 square yards (2,500 tons)
	Pipe installation/pipe	2,250 linear feet
	Hauling/dirt export	6,300 tons
	Concrete structures/concrete	120 cubic yards
	Paving/asphalt	1,800 tons

* Specific quantities of soil excavation that would be required to provide the needed detention volume depend upon site-specific topography and soil conditions, and will be determined during final engineering of the proposed project. Value provided is rough estimate.

Following is a summary list of the types of earth-disturbing activities that would occur in association with the proposed project.

- Geotechnical studies will be required to properly design the attenuation basins and evaluate groundwater conditions (i.e., whether shallow groundwater is present in excavation areas).
- Excavation / trenching and slope protection would be required to install the culvert system north of SR-18.
- The pipelines proposed to the north of SR-18 and from Pine Avenue to Little Bear Creek would likely be installed in eight-foot segments, the size in which the pipes are manufactured, with the trench back-filled following the placement of each eight-foot segment.
- Trenching up to depths of 22 feet may be required to install the pipeline from Pine Avenue and under SR-18 to Little Bear Creek.
- The attenuation basins would be constructed prior to the culvert system(s), and would require excavation activities to achieve desired detention volume of up to 20 acre feet.

Clear and grub wastes generated during construction of the proposed project may be taken to Heaps Peak Transfer Station for disposal. Other exported waste types may also be disposed of at this transfer station or be made the property of the contractor to be used or disposed of outside of County right-of-way at their discretion. Heaps Peak Transfer Station is located at 29898 SR-18 at Heaps Peak in Running Springs, approximately five miles east of the proposed project site, along SR-18.

Equipment. The number of off-road vehicles and equipment to be used during construction of the proposed project could vary from one or two to as many as 20 or 30, depending on actual site conditions, construction schedule, and the specific construction activity. The types of equipment anticipated to be required during construction of the proposed project include the following: water trucks, loaders, backhoe, wheel-mounted air compressor(s), excavators, pneumatic breaker, pneumatic-tired motor grader, steel drum roller, self-propelled paving machine, and haul trucks. Tables 2-2 through 2-4 lists the off-road equipment that would be used during the three years of construction.

Table 2-2. Construction Off-Road Equipment – Sediment Basin Construction

Equipment Type by Phase	Horsepower	Number	Hours / Day	# Days
Clearing &Grubbing/Tree Removal				
Bulldozer	240	1	8	10
Excavator	300	1	8	10
Loader	225	1	8	10
Chipper	50	1	8	10
Chainsaw	6	3	8	10
Water Truck	457	1	8	10
Sewer Relocation				
Backhoe	107	1	8	15
Loader	225	1	8	15
Water Truck	457	1	8	15
Excavation				
Excavator	300	2	8	20
Bulldozer	240	1	8	20
Loader	225	2	8	20
Water Truck	457	1	8	20
Hauling				
Loader	225	1	8	30
Excavator	300	1	8	30
Water Truck	457	1	8	30
Culvert Construction				
Excavator	300	1	8	10
Loader	225	1	8	10
Sheepsfoot/Roller/Tamper	100	1	8	10
Water Truck	457	1	8	10
Embankment Construction				
Loader	225	2	8	19
Bulldozer	240	1	8	19
Grader	220	1	8	19
Sheepsfoot/Roller/Tamper	100	1	8	19
Water Truck	457	1	8	19
Concrete Structures				
Backhoe	107	1	8	1
Generator	5	1	4	5

Table 2-2. Construction Off-Road Equipment – Sediment Basin Construction

Equipment Type by Phase	Horsepower	Number	Hours / Day	# Days
Rock Placement				
Excavator	300	1	8	10
Loader	225	1	8	10
Paving & Miscellaneous				
Paving Machine	200	1	8	2
Roller	60	2	8	2
Water Truck	457	1	8	2
Skip	100	1	8	2

Table 2-3. Construction Off-Road Equipment – SH 18 Drain Construction

Equipment Type by Phase	Horsepower	Number	Hours / Day	# Days
Asphalt Concrete Removal				
Backhoe w/breaker	107	1	8	10
Loader	225	1	8	10
Water Truck	457	1	8	10
Pipe Installation				
Excavator	115	1	8	25
Loader	225	1	8	25
Water Truck	457	1	8	25
Hauling (Dirt Export)				
Loader	225	1	8	10
Water Truck	457	1	8	10
Backfill & Compaction				
Loader	225	1	8	25
Vibratory Compactor	100	1	8	25
Water Truck	457	1	8	25
Concrete Structures				
Backhoe w/breaker	107	1	4	5
Paving & Miscellaneous				
Paving Machine	200	1	8	3
Vibratory Roller(s)	60	2	8	3
Skip	100	1	8	3
Water Truck	457	1	8	3

Table 2-4. Construction Off-Road Equipment – Pine Avenue Drain Construction

Equipment Type by Phase	Horsepower	Number	Hours / Day	# Days
Asphalt Concrete Removal				
Backhoe w/breaker	107	1	8	7
Loader	225	1	8	7

Table 2-4. Construction Off-Road Equipment – Pine Avenue Drain Construction

Equipment Type by Phase	Horsepower	Number	Hours / Day	# Days
Water Truck	457	1	8	7
Pipe Installation				
Excavator	115	1	8	20
Loader	225	1	8	20
Water Truck	457	1	8	20
Hauling (Dirt Export)				
Loader	225	1	8	10
Water Truck	457	1	8	10
Backfill & Compaction				
Loader	225	1	8	20
Vibratory Compactor	100	1	8	20
Water Truck	457	1	8	20
Concrete Structures				
Backhoe w/breaker	107	1	4	5
Paving & Miscellaneous				
Paving Machine	200	1	8	2
Vibratory Roller(s)	60	2	8	2
Skip	100	1	8	2
Water Truck	457	1	8	2

The on-road vehicles required during project construction would consist of worker commuting vehicles, dump trucks, other large haul/delivery trucks, concrete trucks, concrete pump trucks, medium-heavy delivery trucks vehicles including fuel trucks, and crew trucks. The specific assumptions for the number of trips for each vehicle type during each construction sub phase for all three years of construction are provided in Appendix 2 (Air Pollutant Emissions Calculations).

Possible Staging and Flow Interception Area. Possible construction staging and employee parking may be located within the 1.55 acre area adjacent to the Fire Station near the upstream end of the proposed storm drain (west end of Rimforest) as depicted on Figure 2. The District may attempt to collect runoff within the existing Fire Station area prior to the flow reaching the shoulder area within SR-18. The flow will be collected and then conveyed to the proposed storm drain within SR-18. The collection system within the Fire Station area has not been designed but it is anticipated to consist of some simple grading and catch basins and / or culvert apron.

Transportation. It is anticipated that either State Highway 138 or Interstate 210 would be used to transport construction vehicles, equipment, and materials to and from the proposed project site, via SR-18. SR-138 travels in an east-west alignment from Interstate 5 south of Gorman (west of the proposed project area) to Mount Anderson Junction, where it joins SR-18 south of Crestline, west of the proposed project site. Interstate 210 travels in an east-west alignment from Interstate 5 at Sylmar (west of the project site) to Interstate 10 in Redlands (east of the project site).

Utilities. A construction management trailer would be required to support construction of the proposed Project. Connection to power, water, and possibly telephone service would be required for the construction management trailer. Portable toilets would be provided on the construction site, and the construction management trailer would not require sewer service. The construction contractor selected to con-

struct the proposed Project would be responsible for providing generators and fuel as needed to power the equipment and vehicles required during construction. If nighttime construction is required, the construction contractor would also provide the necessary lighting. Proposed construction facilities will not impact existing utility systems.

Water. During construction of the proposed project, a water source would be required for dust control and soil compaction. It is anticipated that existing fire hydrants located within the community of Rimforest would be used to obtain the proposed project's water supply. This water supply is provided by the Lake Arrowhead Community Services District. A water truck(s) would be used to spray water on the ground surface as necessary to achieve dust control goals.

Temporary and Permanent Disturbance. The total area of temporary disturbance would be approximately 10.03 acres and permanent disturbance would include approximately 6.24 acres. The boundaries of temporary and permanent disturbance are shown on Figure 3.

2.3.2 Operation and Maintenance

Operation and maintenance of the proposed project would generally occur at 3-5 year intervals and would include but is not limited to the following activities:

- Slope stabilization, where necessary to maintain the integrity of flood conveyance facilities;
- Removal of sediment and vegetation from the retarding basin(s) and channelized sections to maintain capacity;
- Regular inspection of facilities for wear and damage;
- Repair of facilities as needed; and
- Maintenance of vegetated landscape buffers.

In addition, clearing of the storm drains and catch basins may occur on a quarterly basis.

No use of chemicals such as herbicides and pesticides, among others, are anticipated during operation of the proposed project. However, materials such as motor oil and lubricants would be used by inspection vehicles and equipment required for operational activities such as sediment removal and slope stabilization.



0 240 480
Feet

Temporary Disturbance Area
Permanent Impact Area

Figure 3
Permanent and Temporary Disturbance

2.4 Required Permits and Approvals

Construction and operation of the proposed project may require the discretionary actions and approvals listed below, per jurisdiction.

Federal

- United States Fish and Wildlife Service (USFWS)
 - Biological Opinion/Endangered Species Act/Section 7 Consultation
- United States Army Corps of Engineers (USACE)
 - Clean Water Act Section 404 Individual Permit

State

- California Department of Transportation
 - Right-of-way (ROW) Encroachment Permit
 - Transportation Permit
- California Department of Fish and Wildlife
 - Streambed Alteration Agreement / California Fish and Game Code Section 1600
 - 2081 Incidental Take Permit (if applicable)
- State Water Resources Control Board
 - Water rights transfer agreement (if applicable)
- Native American Heritage Commission
 - Consultation on Sacred Areas to comply with State requirements

Regional

- Santa Ana River and Lahontan Regional Water Quality Control Boards (RWQCBs)
 - National Pollutant Discharge Elimination System (NPDES) Permit (Stormwater Pollution Prevention Plan (SWPPP)
 - Water Quality Certification/Clean Water Act Section 401

2.5 Environmental Commitments

Several mechanisms have been incorporated into the proposed Project that would minimize potential environmental effects. The County has developed Environmental Commitments (ECs) that are specific to environmental issue areas, such as air quality, biological resources, or traffic impacts. All Project-related activity would be subject to the ECs. Table 2-5 lists the ECs incorporated into the proposed Project to minimize or avoid potential environmental impacts.

Table 2-5. Environmental Commitments

Environmental Commitment	Issue Areas Affected
Landscape buffers will be planted on portions of the attenuation basin slopes as necessary	Aesthetics
Geotechnical studies will be required to properly design the attenuation basins and evaluate groundwater conditions (i.e. Whether shallow groundwater is present in excavation areas).	Geology and Soils
The county will prepare a Water Quality Management Plan (WQMP) and Stormwater Pollution Prevention Plan (SWPPP) to identify site design, pollution source control, and best management practices (BMPs) to prevent water quality degradation.	Hydrology and Water Quality
The county will also perform a preliminary drainage study to analyze the addition of runoff to potential 100-year flood impacts at Lake Arrowhead.	Hydrology and Water Quality

3.2 Air Quality and Greenhouse Gases

This section addresses both Air Quality and Greenhouse Gas (GHG) Emissions. Air Quality is comprised of the analysis of the impacts of criteria and air toxic air pollutant emissions, while GHG Emissions is comprised of the analysis of the impacts of GHG emissions and the effects of climate change.

3.2.1 Environmental Setting

The proposed project is located in the unincorporated community of Rimforest, which is located within the South Coast Air Basin (SCAB) under the South Coast Air Quality Management District (SCAQMD) jurisdiction. Most of the SCAB is characterized by a Mediterranean climate with warm, dry summers and cool winters with seasonally heavy precipitation that occurs primarily during the winter months. Summers typically have clear skies, warm temperatures, and low humidity. However, the project site is at an altitude of more than 4,500 feet above sea level and so has an alpine-influenced climate with generally cooler days and nights year round, particularly during winter, and more precipitation than the lower elevations. Some of the precipitation is in the form of snow rather than rain in the winter. A monthly climate summary for the community of Rimforest is provided in Table 3.2-1.

Table 3.2-1. Rimforest Area Monthly Average Temperatures and Precipitation

Month	Temperature (°F)		Precipitation
	Maximum	Minimum	
January	44	29	8.39
February	47	30	8.99
March	53	32	8.03
April	60	35	2.53
May	67	41	1.32
June	76	49	0.28
July	81	55	0.10
August	81	55	0.33
September	76	50	1.07
October	64	41	2.01
November	52	34	3.45
December	45	29	5.16

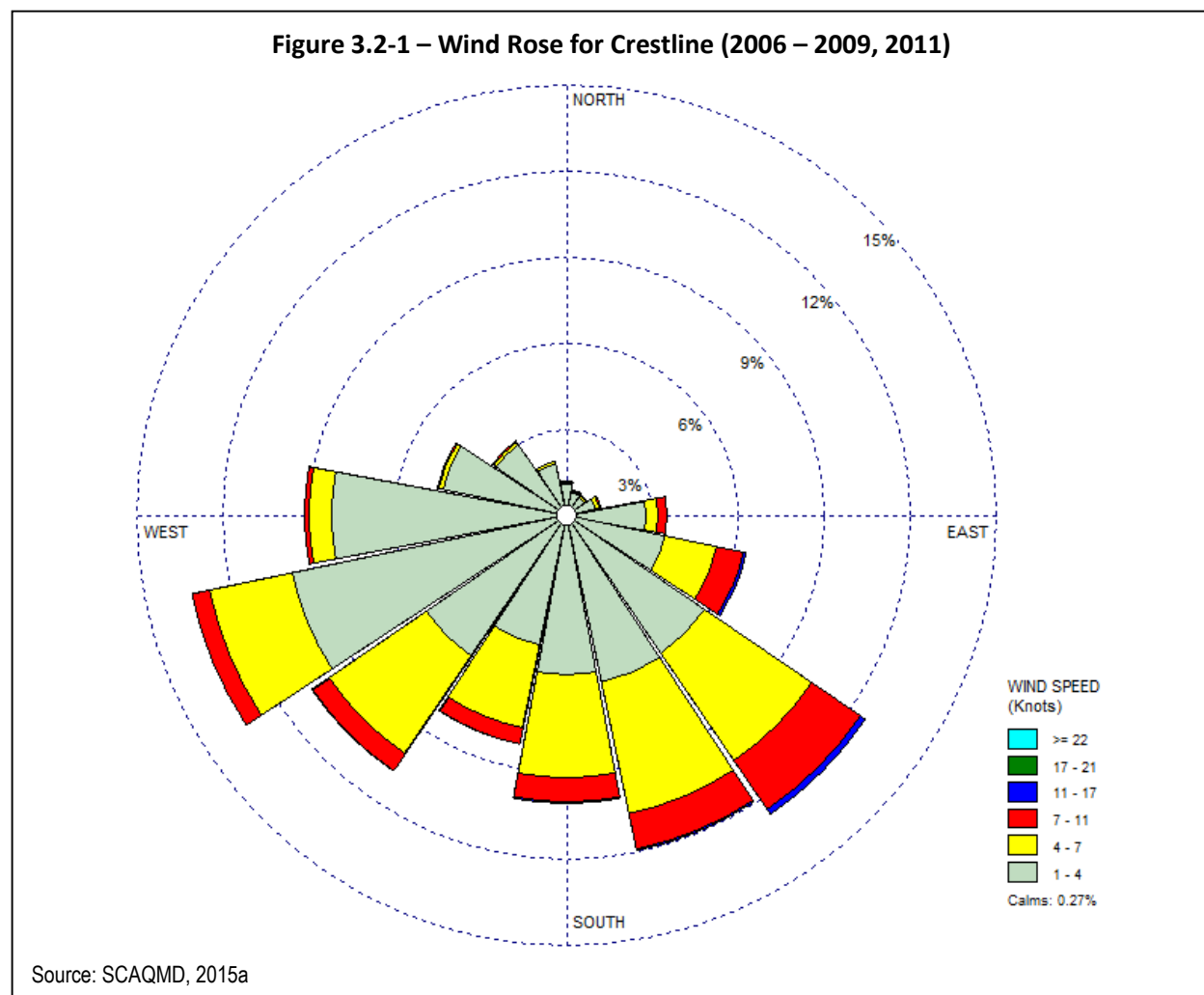
Source: Intellicast, 2015

Average summer (June to September) high and low temperatures in the study area range from 81 °F to 49 °F. Average winter (December to March) high and low temperatures range from 53 °F to 29 °F. The average annual precipitation is approximately 42 inches with over 70 percent occurring between December and March. Summers are dry; starting in June, three straight months average an inch of precipitation or less. Little precipitation occurs during summer because of high-pressure cell blocks migrating storm systems over the eastern Pacific Ocean, but the San Bernardino Mountains do experience more rain in the summer than most of the SCAB, often in the form of desert monsoon-influenced summer thunderstorms.

The typical wind speeds and directions for the project area are depicted in Figure 3.2-1 using a wind rose from the Crestline air pollutant monitoring station, which is the nearest monitoring station to Rimforest and is located approximately 3 miles west northwest of the project site. As shown, a strong predominant flow from the west southwest through the southeast, or from the South Coast Air Basin to the Mojave Desert Air Basin, with generally low wind speeds but with very few calm wind hours. This wind rose is based on five years of data between 2006 to 2009 and 2011, and the average wind speed during this five-year period was just under 3.7 miles per hour. The conditions at the Rimforest project site will be somewhat different given the specific topography around the project site and the fact that it is located approximately 1,100 feet higher in elevation than Crestline.

Air Pollutants and Monitoring Data

Air pollutants are defined as two general types: (1) “criteria” pollutants, representing six pollutants for which national and state health- and welfare-based ambient air quality standards have been established; and (2) toxic air contaminants (TACs), which may lead to serious illness or increased mortality even when present at relatively low concentrations. Generally, TACs do not have ambient air quality standards. The three TACs that do have ambient air quality standards (lead, vinyl chloride, and hydrogen sulfide) are pollutants that are not relevant to the proposed project.



Criteria Pollutants

The U.S. Environmental Protection Agency (USEPA), California Air Resources Board (ARB), and the local air districts classify an area as attainment, unclassified, or nonattainment depending on whether or not the monitored ambient air quality data shows compliance, insufficient data available, or non-compliance with the ambient air quality standards, respectively. The National and California Ambient Air Quality Standards (NAAQS and CAAQS) relevant to the proposed project are provided in Table 3.2-2; Table 3.2-3 summarizes the federal and state attainment status of criteria pollutants for the SCAQMD based on the NAAQS and CAAQS, respectively.

Table 3.2-2. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards	Health Effects
Ozone (O ₃)	1-hour	0.09 ppm	--	Breathing difficulties, lung tissue damage
	8-hour	0.070 ppm	0.075 ppm	
Respirable particulate matter (PM ₁₀)	24-hour	50 µg/m ³	150 µg/m ³	Increased respiratory disease, lung damage, cancer, premature death
	Annual	20 µg/m ³	--	
Fine particulate matter (PM _{2.5})	24-hour	--	35 µg/m ³	Increased respiratory disease, lung damage, cancer, premature death
	Annual ¹	12 µg/m ³	12 µg/m ³	
Carbon monoxide (CO)	1-hour	20 ppm	35 ppm	Chest pain in heart patients, headaches, reduced mental alertness
	8-hour	9.0 ppm	9 ppm	
Nitrogen dioxide (NO ₂)	1-hour	0.18 ppm	0.100 ppm ²	Lung irritation and damage
	Annual	0.030 ppm	0.053 ppm	
Sulfur dioxide (SO ₂)	1-hour	0.25 ppm	0.075 ppm ²	Increases lung disease and breathing problems for asthmatics
	3-hour	--	0.5 ppm	
	24-hour	0.04 ppm	--	

Notes:

ppm = parts per million; µg/m³ = micrograms per cubic meter; "--" = no standards

1 – The federal standard shown is the primary standard; the secondary standard is 15 µg/m³.

2 – The new federal 1-hour NO₂ and SO₂ standards are based on the 98th and 99th percentile of daily hourly maximum values, respectively.

Source: ARB, 2015a; ARB, 2001

Table 3.2-3. Attainment Status for the SCAB

Pollutant	Attainment Status	
	Federal	State
O ₃	Extreme Nonattainment	Extreme Nonattainment
PM ₁₀	Attainment/Maintenance	Nonattainment
PM _{2.5}	Nonattainment	Nonattainment
CO	Attainment/Maintenance	Attainment
NO ₂	Attainment/Maintenance	Attainment
SO ₂	Attainment	Attainment

Source: ARB, 2015b; USEPA, 2015a

Table 3.2-4 summarizes the historical air quality data for the project area collected at the nearest representative air quality monitoring stations to Rimforest. The air monitoring station used for ozone and PM₁₀ is located in Crestline, while the air monitoring station used for PM_{2.5}, CO, and NO₂ is located in San Bernardino and the air monitoring station used for SO₂ is located in Fontana. Table 3.2-4 presents the maximum pollutant levels measured from the monitoring stations from 2012 through 2014.

Table 3.2-4. Background Ambient Air Quality Data

Pollutant	Averaging Time	Maximum Concentration (ppm or $\mu\text{g}/\text{m}^3$) ¹		
		2012	2013	2014
O ₃	1-hour	0.140	0.120	0.130
	8-hour	0.112	0.105	0.106
PM ₁₀	24-hour	43	37	47
	Annual	18.9	21.4	18.5
PM _{2.5}	24-hour ²	27.1	33.4	--
	Annual	11.8	11.4	--
CO	8-hour	1.7	1.7	--
NO ₂	1-hour ²	0.060	0.055	0.056
	Annual	0.019	0.018	0.018
SO ₂	1-hour ²	0.004	0.003	--

Notes:

ppm = parts per million; $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter; "--" = no data

1 – Gaseous pollutant (ozone, SO₂, NO₂, and CO) concentrations are shown in ppm and particulate (PM₁₀ and PM_{2.5}) concentrations are shown in $\mu\text{g}/\text{m}^3$.

2 – 24-hour PM_{2.5} data and 1-hour NO₂ data shown are the 98th percentile values and SO₂ for 2011 and 2012 are 99th percentile values.

Source: SCAQMD, 2015b; ARB, 2015c

The ambient air quality data shown above indicates that in the three years of data shown, the local Rimforest area had experienced exceedances of the federal and state ozone standards. No exceedances of the federal or state PM₁₀ standards were observed near Rimforest and it is unlikely that PM_{2.5}, CO, NO₂, or SO₂ standards were exceeded in Rimforest, but this conclusion cannot be confirmed because the closest available monitoring data were collected in San Bernardino and Fontana.

Sensitive Receptors

There are residences and workplaces located within 25 to 50 meters of the SR-18 Drain and Pine Avenue Drain construction routes within Rimforest. The Basin construction area is located further from receptors with minimum distances over 50 meters for all construction areas and over 100 meters from the main basin construction area. The closest school is the Rim of the World High School that is located approximately 500 meters from the eastern edge of the new drainage basin.

Greenhouse Gas Emissions

Climate Change

While climate change has been a concern since at least 1998, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), efforts devoted to GHG emissions reduction, and climate change research and policy have increased dramatically in recent years.

Global climate change (GCC) is expressed as changes in the average weather of the Earth, as measured by change in wind patterns, storms, precipitation, and temperature. Much scientific research has indicated that the human-related emissions of GHGs above natural levels are likely a significant contributor to GCC.

Because the direct environmental effect of GHG emissions is the increase in global temperatures, which in turn has numerous indirect effects on the environment and humans, the area of influence for GHG impacts associated with the proposed project would be global. However, those cumulative global impacts would be manifested as impacts on resources and ecosystems in California. Additionally, as this analysis

concerns cumulative global impacts, there is no separate cumulative impacts analysis for GCC in Section 5 (Cumulative Effects) of this EIR.

Setting

The project site is located in the community of Rimforest in the extreme northern area of the SCAB bordering the Mojave Desert Air Basin. In California, ARB is designated as the responsible agency for traditional air quality regulations. In addition, Assembly Bill (AB) 32 vested ARB with regulatory authority for GHGs.

Description of Greenhouse Gases

Greenhouse gases are gases that trap heat in the atmosphere and are emitted by natural processes and human activities. Examples of GHGs that are produced both by natural processes and by industry include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). The accumulation of GHGs in the atmosphere regulates the earth's temperature. GHGs have varying amounts of global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. By convention, CO₂ is assigned a GWP of 1. In comparison, CH₄ has a GWP of 25, which means that it has a global warming effect 25 times greater than CO₂ on an equal-mass basis. To account for their GWP, GHG emissions are often reported as CO₂e (CO₂ equivalent). The CO₂e for a source is calculated by multiplying each GHG emission by its GWP, and then adding the results together to produce a single, combined emission rate representing all GHGs.

3.2.2 Applicable Regulations, Plans, and Standards

Air Quality

Sources of air emissions in the SCAB are regulated by the USEPA, ARB, and SCAQMD. In addition, regional and local jurisdictions play a role in air quality management. The role of each regulatory agency is discussed below.

Federal

The federal Clean Air Act (CAA) of 1970 and its subsequent amendments form the basis for the nation's air pollution control effort. The USEPA is responsible for implementing most aspects of the CAA. Basic elements of the CAA include the establishment of NAAQS for major air pollutants, hazardous air pollutant standards, attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The CAA delegates the enforcement of the federal standards to the states. In California, the ARB is responsible for enforcing air pollution regulations. In the SCAB, the SCAQMD has this responsibility.

State Implementation Plan

For areas that do not attain the NAAQS, the CAA requires the preparation of a State Implementation Plan (SIP), detailing how the state will attain and maintain the NAAQS within mandated timeframes. In response to this requirement, the SCAQMD and Southern California Association of Governments (SCAG) have developed air quality management plans (AQMPs). The focus of the 2003 AQMP was to demonstrate attainment of the federal PM₁₀ standard by 2006 and the federal 1-hour O₃ standard by 2010, while making expeditious progress toward attainment of state standards (SCAQMD, 2003). The 2003 AQMP also includes an NO₂ maintenance plan.

On June 11, 2007, the USEPA re-designated the SCAB from nonattainment to attainment for the CO 1-hour and 8-hour NAAQS. The USEPA also approved a SIP revision for the SCAB nonattainment area, stating that this area meets the CAA requirements for maintenance plans for CO. The USEPA made an adequacy finding and approved motor vehicle emission budgets, which are included in the maintenance plan. The USEPA also approved the California motor vehicle inspection and maintenance (I/M) program as meeting the low enhanced I/M requirements for CO in the South Coast region (USEPA, 2007).

The SCAQMD and SCAG, in cooperation with the ARB and the USEPA, have developed the 2007 AQMP for purposes of demonstrating compliance with the new NAAQS for PM_{2.5}, the NAAQS for PM₁₀, the 8-hour O₃ NAAQS, the 1-hour O₃ NAAQS, and other air quality planning requirements. The 1-hour O₃ standard was revoked by the USEPA, but the SCAQMD is still tracking progress towards attainment of this standard. The SCAQMD Governing Board adopted the Final 2007 AQMP on June 1, 2007 (SCAQMD, 2007).

Since it will be more difficult to achieve the 8-hour O₃ NAAQS compared to the 1-hour NAAQS, the 2007 AQMP contains substantially more emission reduction measures compared to the 2003 AQMP. The USEPA approved nearly all elements of the 2007 PM_{2.5} plan and the 2007 8-hour O₃ Plan in 2011. On June 12, 2013, the USEPA provided final approval of SCAQMD's 2009 PM₁₀ Redesignation Request and Maintenance Plan. Later in 2013, USEPA approved the South Coast 1997 PM_{2.5} NAAQS contingency measures that will terminate the sanctions and FIP clocks that were triggered by USEPA's partial disapproval of the South Coast's 2007 PM_{2.5} plan.

During 2012 and 2013, the USEPA determined that the 1-hour ozone plan was inadequate and withdrew approval of the vehicle-miles-traveled (VMT) emissions offset demonstration for the 8-hour Ozone Plan. As a result, the District is required to submit new plan elements to demonstrate 1-hour and 8-hour ozone attainment.

The AQMD Governing Board approved the 2012 AQMP on December 7, 2012 (SCAQMD, 2012). This plan addresses the 1-hour and 8-hour Ozone Plan inadequacies identified by the USEPA and provides a 24-hour PM_{2.5} plan. However, this AQMP has not yet been approved by the USEPA, so it is not the applicable AQMP for CEQA review.

Currently, the 2009 Maintenance Plan is the applicable plan for PM₁₀, and the 2007 AQMP is the applicable plan for ozone and PM_{2.5}.

Emission Standards for Non-Road Diesel Engines

The USEPA has established a series of cleaner emission standards for new off-road diesel engines culminating in the Tier 4 Final Rule of June 2004. The Tier 1, Tier 2, Tier 3, and Tier 4 standards require compliance with progressively more stringent emission standards. Tier 1 standards were phased in from 1996 to 2000 (year of manufacture), depending on the engine horsepower category. Tier 2 standards were phased in from 2001 to 2006, and the Tier 3 standards were phased in from 2006 to 2008.

The Tier 4 standards complement the latest 2007 and later on-road, heavy-duty engine standards by requiring 90 percent reductions in diesel particulate matter (DPM) and NO_x when compared against current emission levels. The Tier 4 standards are currently being phased in, starting with smaller engines in 2008 until all but the very largest diesel engines meet NO_x and particulate matter (PM) standards in 2015.

Non-Road Diesel Fuel Rule

In May 2004, the USEPA set sulfur limits for non-road diesel fuel. Under this rule, sulfur levels in non-road diesel fuel would be limited to 500 ppm starting in 2007 and 15 ppm starting in 2010 (USEPA, 2004), at

which time it would be equivalent to sulfur content restrictions of the California Diesel Fuel Regulations (described below).

Emission Standards for On-Road Trucks

To reduce emissions from on-road, heavy-duty diesel trucks, the USEPA established a series of cleaner emission standards for new engines, starting in 1988. These emission standards regulations have been revised over time. The latest effective regulation, the 2007 Heavy-Duty Highway Rule, provides for reductions in PM, NO_x, and non-methane hydrocarbon emissions that were phased in during the model years 2007 through 2010 (USEPA, 2000).

State

California Clean Air Act

In California, the ARB is designated as the responsible agency for all air quality regulations. The ARB, which became part of the California Environmental Protection Agency (Cal/EPA) in 1991, is responsible for implementing the requirements of the federal CAA, regulating emissions from motor vehicles and consumer products, and implementing the California Clean Air Act of 1988 (CCAA). The CCAA outlines a program to attain the CAAQS for O₃, NO₂, SO₂, and CO by the earliest practical date. Since the CAAQS are often more stringent than the NAAQS, attainment of the CAAQS will require more emission reductions than what is required to demonstrate attainment of the NAAQS. Similar to the federal requirements, the state requirements and compliance dates are based on the severity of the ambient air quality standard violation within a region.

Heavy Duty Diesel Truck Idling Regulation

This ARB rule became effective February 1, 2005, and prohibits heavy-duty diesel trucks from idling for longer than five minutes at a time, unless they are queuing, and provided the queue is located more than 100 feet from any homes or schools (ARB, 2006).

California Diesel Fuel Regulations

In 2004, the ARB set limits on the sulfur content of diesel fuel sold in California for use in on-road and off-road motor vehicles (ARB, 2004). Under this rule, sulfur content of diesel fuel was limited to 15 ppm starting in June 2006.

Local

South Coast Air Quality Management District

The SCAQMD is primarily responsible for planning, implementing, and enforcing federal and state ambient standards within this portion of the SCAB. As part of its planning responsibilities, SCAQMD prepares Air Quality Management Plans and Attainment Plans as necessary based on the attainment status of the air basins within its jurisdiction. The SCAQMD is also responsible for permitting and controlling stationary source criteria and air toxic pollutants as delegated by the USEPA.

Through the attainment planning process, the SCAQMD develops the SCAQMD Rules and Regulations to regulate sources of air pollution in the SCAB (SCAQMD, 2015c). This project would not include any stationary or portable stationary emissions sources that would be subject to SCAQMD air quality

permitting regulations and no greenwaste composting would be done at the project site. The SCAQMD rules applicable to the proposed project are listed below.

SCAQMD Rule 401 – Visible Emissions. This rule prohibits discharge of air contaminants or other materials that are as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, or that obscures an observer's view.

SCAQMD Rule 402 – Nuisance. This rule prohibits discharge of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any such persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property.

SCAQMD Rule 403 – Fugitive Dust. The purpose of this rule is to control the amount of PM entrained in the atmosphere from man-made sources of fugitive dust. The rule prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area to be visible beyond the emission source's property line. During project construction, best available control measures identified in the rule would be required to minimize fugitive dust emissions from proposed earth-moving and grading activities. These measures would include site watering as necessary to maintain sufficient soil moisture content.

Additional Rule 403 requirements apply to large operations, which is defined as active operations on property that contains 50 or more acres of disturbed surface area; or any earth-moving operation with a daily earth-moving or throughput volume of 5,000 cubic yards or more, three times during the most recent 365-day period. These requirements include submittal of a dust control plan, maintaining dust control records, and designating a SCAQMD-certified dust control supervisor. The proposed project's construction would not exceed these two triggers and so would not be subject to these additional Rule 403 requirements.

SCAQMD Regulation XI – Source Specific Standards. This regulation is composed of several dozen individual rules, most of which are not applicable to the proposed project. Specific rules that may be applicable include:

- Rule 1133.1 - Chipping and Grinding Facilities. This rule would apply to the vegetation chipping proposed to handle the cleared vegetation. The proposed project would fall under exemption (f)(2) that would limit the rule requirements to compliance with part (d)(1), which does not allow the receipt of foodwaste. Foodwaste is not proposed to be accepted as part of the chipping operations.
- Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil. This regulation would only be applicable in the very unlikely event that contaminated soils are discovered during project excavation work.

San Bernardino County

There are air quality goals and policies (Goal CO 4.) within the San Bernardino County General Plan (SBC, 2013), and general performance standards within the San Bernardino County Development Code (§83.01.040 Air Quality) (SBC, 2014). In general, compliance with SCAQMD rules and regulations will provide compliance with the potentially applicable policies (CO 4.1) and general performance standards [§83.01.040 (a) through (c)] of the General Plan and Development Code, respectively.

Greenhouse Gas Emissions

All levels of government have some responsibility for the protection of air quality, and each level (federal, state, and regional/local) has specific responsibilities relating to air quality regulation. Regulation of GHGs

is a relatively new component of air quality. Several legislative actions have been adopted to regulate GHGs on a federal, state, and local level.

Federal

Massachusetts v. EPA

In April 2007, the U.S. Supreme Court held that GHG emissions are pollutants within the meaning of the CAA. In reaching its decision, the court also acknowledged that climate change results, in part, from anthropogenic causes. (*Massachusetts et al. Environmental Protection Agency* 549 U.S. 497, 2007). The Supreme Court's ruling paved the way for the regulation of GHG emissions by USEPA under the CAA.

Clean Air Act

The federal CAA of 1970 and its subsequent amendments form the basis for the nation's air pollution control effort. The USEPA is responsible for implementing most aspects of the CAA. Under the provisions of the CAA to protect public health and welfare, the USEPA has the authority to regulate GHGs, should a finding be made that GHGs have the potential for adverse impacts.

In response to the Supreme Court decision on December 7, 2009, the USEPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

- **Endangerment Finding:** That the current and projected concentrations of the GHGs in the atmosphere threaten the public health and welfare of current and future generations, and
- **Cause or Contribute Finding:** That the combined emissions of GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

USEPA has enacted a number of regulations and other environmental rules regarding GHG emissions, including:

- Mandatory GHG Reporting,
- GHG Tailoring Rule for PSD Permits,
- GHG Vehicle Emissions Standards,
- Corporate Average Fuel Economy Standards, and
- Renewables Fuel Standard.

None of these federal regulations are specifically relevant to the construction or operation of the proposed project.

State

California is one of several states that have set GHG emission targets. Executive Order S-3-05 and AB 32, the California Global Warming Solutions Act of 2006, promulgated targets to achieve reductions in GHG to 1990 GHG levels by the year 2020. This target-setting approach allows progress to be made in addressing climate change, and is a forerunner to setting emission limits.

AB 32 – California Global Warming Solutions Act of 2006

AB 32 was signed into law by Governor Schwarzenegger on September 27, 2006, and is the first law to comprehensively limit GHG emissions at the state level. The intent of AB 32 is to reduce California GHG

emissions to 1990 levels by 2020. AB 32 instructs the ARB to adopt regulations that will reduce emissions from significant sources of GHG and establish a mandatory GHG reporting and verification program by January 1, 2008. AB 32 requires the ARB to adopt GHG emission limits and emission reduction measures by January 1, 2011, both of which became effective on January 1, 2012. AB 32 does not identify a significance level of GHG for CEQA purposes, nor has the ARB adopted such a significance threshold.

In accordance with AB 32, the ARB approved the Climate Change Scoping Plan (Scoping Plan) (ARB, 2008) in October 2008, which outlines California's strategy for achieving the 2020 GHG emissions limit outlined under the law. The Scoping Plan includes recommendations for reducing GHG emissions from most sectors of the California economy. The scoping plan has a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program. These measures have been introduced through four workshops between November 30, 2007, and April 17, 2008. A draft scoping plan was released for public review and comment on June 26, 2008, followed by more workshops in July and August 2008. The proposed scoping plan was released on October 15, 2008, and approved at the Board hearing on December 12, 2008. The draft of the First Update to the Scoping Plan was published in February 2014, followed by its accompanying Environmental Analysis (CEQA Equivalent Document) published in March 2014. The Scoping Plan update was approved at an Air Resources Board Hearing on May 22, 2014.

Executive Order S-3-05

Executive Order S-3-05, signed by Governor Schwarzenegger on June 1, 2005, calls for a reduction in GHG emissions to 1990 levels by 2020 and for an 80 percent reduction in GHG emissions by 2050. Executive Order S-3-05 also calls for the Cal/EPA to prepare biennial science reports on the potential impact of continued GCC on certain sectors of the California economy. The first of these reports, "Our Changing Climate: Assessing Risks to California," and its supporting document "Scenarios of Climate Change in California: An Overview" were published by the California Climate Change Center in 2006.

California Senate Bill 97

Senate Bill 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directs the Governor's Office of Planning and Research (OPR) to develop draft CEQA guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions" by July 1, 2009, and directs the California Natural Resources Agency to certify and adopt the CEQA guidelines by January 1, 2010.

The OPR published a technical advisory on CEQA and Climate Change on June 19, 2008. The guidance did not include a suggested threshold, but stated that the OPR has asked the ARB to, "recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of greenhouse gas emissions throughout the state." The OPR does recommend that CEQA analyses include the following components:

- Identify Greenhouse Gas Emissions
- Determine Significance
- Mitigate Impacts

On December 30, 2009, the California Natural Resources Agency adopted amendments to the CEQA Guidelines including GHG/Climate Change analysis guidelines. According to the California Natural Resources Agency (CNRA, 2009), "due to the global nature of GHG emissions and their potential effects,

GHG emissions will typically be addressed in a cumulative impacts analysis.” Two GHG CEQA checklist items were included as part of the CEQA Guidelines amendment; they are discussed further in Section 3.2.3.

As discussed in Section 15064.4 of the CEQA Guidelines, the determination of the significance of GHG emissions calls for a careful judgment by the lead agency, consistent with the provisions in Section 15064. Section 15064.4 further provides that a lead agency should make a good-faith effort, to the extent possible and based on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

1. Use a model or methodology to quantify GHG emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or
2. Rely on a qualitative analysis or performance-based standards.

Section 15064.4 also advises a lead agency to consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:

3. The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
4. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and
5. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

Local

South Coast Air Quality Management District

To date, the SCAQMD has developed two regulations regarding GHG emissions (SCAQMD, 2015c). Those regulations are:

SCAQMD Rule 2701 – SoCal Climate Solutions Exchange. This rule establishes a voluntary program to encourage, quantify, and certify voluntary high-quality certified GHG emission reductions in the district.

SCAQMD Rule 2702 – Greenhouse Gas Reduction Program. This program will fund projects through contracts in response to requests for proposals or purchase GHG emission reductions.

These two SCAQMD rules are not applicable to the proposed project.

San Bernardino County

San Bernardino County has an approved Greenhouse Gas Emissions Reduction Plan. The discussion of the applicable requirements of this plan is provided within the discussion of Impact GCC-2 in Section 3.2.3.

3.2.3 Environmental Impacts and Mitigation Measures

This section analyzes the impacts associated with implementation of the proposed project related to air quality and GHG emissions. The impact analysis lists the thresholds used to conclude the significance of an impact and describes the methods used to determine the proposed project's impacts. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, as needed.

Air Quality

Thresholds of Significance

The significance of potential air quality impacts were determined based on relevant State CEQA Guidelines, Appendix G. Project construction and operation would have significant air quality impacts if it would:

- *Criterion AQ1: Conflict with or obstruct implementation of the applicable air quality plan.*
- *Criterion AQ2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation.*
- *Criterion AQ3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).*

The regional thresholds of significance for construction and operation activities as shown below in Table 3.2-5 were used in this EIR to determine the significance of proposed project air quality impacts. These criteria are based on CEQA thresholds recommended by the SCAQMD (SCAQMD, 2015d).

Table 3.2-5. SCAQMD Regional Air Quality Emissions Significance Thresholds

Regional Emissions Significance Thresholds		
Pollutant	Construction	Operation
Nitrogen Oxides (NO _x)	100 lbs./day	55 lbs./day
Volatile Organic Compounds (VOC)	75 lbs./day	55 lbs./day
PM10	150 lbs./day	150 lbs./day
PM2.5	55 lbs./day	55 lbs./day
Sulfur Oxides (SO _x)	150 lbs./day	150 lbs./day
CO	550 lbs./day	550 lbs./day

Source: SCAQMD, 2015d

- *Criterion AQ4: Expose sensitive receptors to substantial pollutant concentrations.*

SCAQMD has published localized significance thresholds (LST) that are used to determine impacts on ambient air quality for off-site sensitive receptors (SCAQMD, 2015e). The published LSTs for construction activities, as shown below in Table 3.2-6, were used in this EIR to determine the significance of project air quality impacts. The emissions impacts of TACs are also evaluated under this significance criterion, and SCAQMD's thresholds for air toxics impacts are also shown in Table 3.2-6.

Table 3.2-6. SCAQMD LST and TACs Air Quality Emissions Significance Thresholds

Localized Significance Criteria		
Pollutant	Construction ¹	Operation ¹
NOx	118 lbs/day, 378 lbs/day	378 lbs/day
CO	667 lbs/day, 4,142 lbs/day	4,142 lbs/day
PM10	4 lbs/day, 65 lbs/day	16 lbs/day
PM2.5	3 lbs/day, 17 lbs/day	5 lbs/day
TACs (includes carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic and Acute Hazard Index ≥ 1.0 (project increment)	

Source: SCAQMD, 2015d; SCAQMD, 2015e

¹ – The first value is for the SR 18 and Pine Avenue Drain construction where the assumptions are a 1 acre active construction site and receptor distance of 25 meters, and the second value is for Basin construction where the assumptions are a 5 acre active construction site and a distance to receptor of 100 meter, and this second set of assumptions is also used for operation.

The proposed project is located in Source Receptor Area (SRA) 37 (Central San Bernardino Mountains). To be conservative, the project work areas (shown in Figure 2 of Section 2) for linear drain construction activities are evaluated using the one-acre LST look-up values provided in SCAQMD CEQA guidance, and the minimum distance to sensitive receptors is assumed to be 25 meters (80 feet). For the major excavation activities associated with the basin construction and major intermittent basin O&M activities the LST look-up values are based on five-acre construction areas and 100 meter distance to receptors, which is conservative since the distance to receptors from the sediment basin are at least 150 meters.

The following threshold from the CEQA Appendix G Environmental Checklist were found to have no impact in the Initial Study and are not discussed further beyond the summary below:

■ *C.3.3 (e) Create objectionable odors affecting a substantial number of people?*

Some objectionable odors may be temporarily created during construction-related activities, such as from diesel exhaust and paving activities. These odors would not affect a substantial number of people and would only occur in localized areas. Therefore, impacts related to objectionable odors would be less than significant.

Emission Calculations Methodology

Air pollutant emissions from the proposed construction activities were calculated using the most current SCAQMD CEQA website and USEPA emission factors and methods, then compared to the thresholds identified in Tables 3.2-5 and 3.2-6 to determine their significance. Additional details on the specific emissions calculation methodology and assumptions are provided in Appendix 2 (Air Pollutant Emissions Calculations) of the original Draft EIR. The SCAQMD CEQA website off-road and on-road emissions factors are based on the California Air Resources Board OFFROAD and on-road EMFAC models adjusted for the South Coast Air Basin. For impacts that exceed a significance threshold, mitigation measures have been applied to reduce impacts to the extent feasible.

Construction Emissions

The proposed project's construction would involve the following main elements:

- Construction of a new 20 acre-feet attenuation basin and connecting culvert in the summer of 2017
- Construction of a new storm drain along SR-18 in the summer of 2018.

- Construction of a new storm drain along Pine Avenue in the summer of 2019.

The detailed assumptions and phases for each of these three summer construction events is provided in Appendix 2 (Air Pollutant Emissions Calculations) of the original Draft EIR.

Construction emissions would result from the use of off-road construction equipment and the trips generated by construction workers and heavy haul trucks, and from earth-moving activities and vehicle travel on paved and unpaved roads/areas that would cause fugitive dust emissions. Construction activities would generate emissions of criteria air pollutants VOCs, NOx, CO, PM10, PM2.5, and SOx.

Equipment usage and scheduling data needed to calculate emissions for proposed construction activities were developed by the County. Construction-related emissions are calculated using the following:

- On-road emissions factors and off-road diesel fueled equipment emission factors from the CARB EMFAC 2014 and OFFROAD emissions factor models based on fleet average emissions for each year of construction.
- Off-road gasoline fueled equipment emissions factors (i.e. for chainsaws and small generators) are from USEPA (USEPA, 2015c).
- USEPA AP 42 (USEPA, 2015b) emission factor calculations for fugitive dust emissions sources. Additional assumptions for calculation inputs were also derived from the SCAQMD Air Quality Handbook (SCAQMD, 2015f; SCAQMD, 1993).

For more information on the construction emissions calculation methodology, assumptions, and the detailed calculations, please refer to Appendix 2 (Air Pollutant Emissions Calculations) of the original Draft EIR.

Operation Emissions

The proposed project would have minor normal operations and maintenance (O&M) emissions from occasional inspection activities and intermittent larger O&M events related to basin sediment removal and also slope maintenance. These larger maintenance events are anticipated to be needed approximately every three to five years. In addition, quarterly sediment removal and maintenance of storm drains and catch basins may occur. The assumptions used to calculate emissions from these operation events are provided in Appendix 2 (Air Pollutant Emissions Calculations) of the original Draft EIR. The calculation methods are the same as those listed for construction, with the assumption that the peak emissions related to the first sediment removal and slope maintenance events occur as early as 2019.

Environmental Controls

The County has not proposed any environmental controls directly related to reducing construction or operation air pollutant emissions, but fugitive dust emissions during construction would be controlled through compliance with SCAQMD Rule 403 – Fugitive Dust. The primary Rule 403 compliance assumption used in the emissions calculations is the use of water to control material handling and unpaved road dust emissions.

Project Impacts

Criterion AQ1: Conflict with or obstruct implementation of the applicable air quality plan.

Impact AQ-1: The Project would conflict with or obstruct implementation of the applicable air quality plan (Class III)

The proposed project would produce emissions of nonattainment pollutants primarily from diesel-powered mobile on-road and off-road sources. The 2007 AQMP proposes emission reduction measures that are designed to bring the SCAB into attainment of the NAAQS and CAAQS. The attainment strategies in this plan include mobile source control measures and clean fuel programs that are enforced at the federal and state levels on engine manufacturers and petroleum refiners and retailers.

The SCAQMD adopts AQMP control measures into the SCAQMD rules and regulations, which are then used to regulate sources of air pollution in the SCAB. The proposed project would comply with these regulatory requirements. Therefore, the proposed project's emissions sources would meet or exceed the emissions control forecasts for all approved AQMP control measures.

Since the 2007 AQMP assumes growth that is consistent with the implementation of this project, it would not exceed the future growth projections in the 2007 AQMP, and it would not conflict with or obstruct implementation of the SIP. As a result, construction and operation of the proposed project would conform to the applicable AQMP; therefore, impacts would be less than significant and no mitigation is required (Class III).

Criterion AQ2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Impact AQ-2: The Project would violate any air quality standard or contribute substantially to an existing or projected air quality violation (Class III)

The proposed project's air pollutant emissions would occur for a short period, less than a year total (occurring over multiple four-to-five month-long periods during summer seasons), and would be well below the magnitude that would cause air quality standard violations or contribute substantially to existing or projected air quality standard violations. Therefore, impacts are less than significant and no additional mitigation is required (Class III).

Please see the regional emissions analysis provided below under Impact AQ-3 and the localized emissions analysis provided under Impact AQ-4 for additional information.

Criterion AQ3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Impact AQ-3: The Project would result in cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard [including releasing emissions which exceed quantitative thresholds for ozone precursors] (Class III)

Construction

The project's maximum daily construction emissions estimate considered the construction phase maximum equipment use and throughputs and the worst-case construction phase overlap. Detailed assumptions for the construction phases, including equipment and on-road vehicle use, are provided in Appendix 2 (Air Pollutant Emissions Calculations) of the original Draft EIR. Table 3.2-7 compares the maximum daily construction emissions of the project with the SCAQMD regional significance thresholds.

Table 3.2-7. Maximum Daily Construction Emissions (lbs/day)

Basin Construction – 2017	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road vehicles	1.15	7.87	7.46	0.03	0.34	0.18
Off-road equipment	5.52	19.28	85.06	0.09	3.07	2.82
Fugitive dust	---	---	---	---	33.37	7.45
Total	6.67	27.15	92.52	0.13	36.78	10.45
SCAQMD Regional Significance Thresholds	75	550	100	150	150	55
Significant?	NO	NO	NO	NO	NO	NO
SR 18 Drain Construction – 2018	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road vehicles	1.23	8.20	10.82	0.05	0.43	0.21
Off-road equipment	4.83	17.38	67.20	0.07	2.77	2.55
Fugitive dust	---	---	---	---	12.71	2.98
Total	6.06	25.58	78.02	0.12	15.90	5.74
SCAQMD Regional Significance Thresholds	75	550	100	150	150	55
Significant?	NO	NO	NO	NO	NO	NO
Pine Ave. Drain Construction - 2019	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road vehicles	1.03	7.06	7.49	0.04	0.35	0.16
Off-road equipment	4.29	17.13	57.89	0.08	2.35	2.16
Fugitive dust	---	---	---	---	9.54	2.25
Total	5.32	24.19	65.38	0.11	12.24	4.58
SCAQMD Regional Significance Thresholds	75	550	100	150	150	55
Significant?	NO	NO	NO	NO	NO	NO

Source: Appendix 2; SCAQMD, 2015d

As shown in Table 3.2-7, construction of the project would not exceed any of the SCAQMD CEQA regional emissions significance thresholds, so the construction emissions impacts are less than significant (Class III).

The air quality cumulative impacts assessment, see Section 5.4.1, determined significant cumulative NO_x emission impacts that would require off-road equipment and on-road equipment mitigation (Mitigation Measures AQ-1 and AQ-2) in the worst-case scenario event, the proposed project would be constructed concurrently with the construction of the Church of the Woods project. If these two mitigation measures are required to be enforced, the proposed project's maximum daily construction NO_x emissions shown above in Table 3.2-7 could be reduced by 30 percent or more.

Operation

The project's maximum daily operation emissions estimate is based on the worst-case intermittent maintenance activity, namely sediment removal. Detailed assumptions for sediment removal, including equipment and on-road vehicle use, are provided in Appendix 2 (Air Pollutant Emissions Calculations) of the original Draft EIR. Table 3.2-8 compares the maximum daily operation emissions of the project with the SCAQMD regional significance thresholds.

Table 3.2-8. Maximum Daily Operation Emissions (lbs/day)

	VOC	CO	NO_x	SO_x	PM10	PM2.5
On-road vehicles	0.57	3.29	10.90	0.04	0.31	0.15
Off-road equipment	1.21	4.85	16.64	0.03	0.61	0.56
Fugitive dust	---	---	---	---	26.45	4.53
Total	1.78	8.14	27.54	0.06	27.37	5.25
SCAQMD Regional Significance Thresholds	55	550	55	150	150	55
Significant?	NO	NO	NO	NO	NO	NO

Source: Appendix 2; SCAQMD, 2015d

As shown in Table 3.2-8, operation of the project would not exceed any of the SCAQMD CEQA regional emissions significance thresholds, so operation impacts are less than significant (Class III).

Criterion AQ4: Expose sensitive receptors to substantial pollutant concentrations.

Impact AQ-4: The Project would expose sensitive receptors to substantial pollutant concentrations (Class III)

Construction Localized Criteria Pollutant Emissions Impacts

SCAQMD LSTs are used to determine if a project could exceed ambient air quality thresholds for nearby receptors. The LSTs were established by SCAQMD for each SRA within their jurisdiction, and represent on-site emission levels that could cause ambient air quality standard exceedances or substantial contributions to existing exceedances at given distances from the site to nearby receptor locations.

The appropriate LSTs for project site construction were compared to the assumed reasonably foreseeable maximum localized on-site daily construction emissions in Table 3.2-9. The Basin construction LST is based on a construction area of 5 acres and a conservative distance to receptor of 100 meters (actual distance is over 150 meters), and the SR-18 Drain Construction and Pine Avenue Drain construction LSTs are based on a construction area of one acre and a distance to receptor of 25 meters.

Table 3.2-9. Maximum Daily Localized Construction Emissions (lbs/day)

Basin Construction - 2017	CO	NO_x	PM10	PM2.5
On-road vehicles	0.79	0.75	0.03	0.02
Off-road equipment	19.28	85.06	3.07	2.82
Fugitive dust	---	---	26.59	5.78
Total	20.07	85.80	29.70	8.63
SCAQMD Localized Significance Thresholds	4,142	378	65	17
Significant?	NO	NO	NO	NO
SR-18 Drain Construction – 2018	CO	NO_x	PM10	PM2.5
On-road vehicles	1.28	4.50	0.01	0.00
Off-road equipment	8.61	26.23	1.03	0.94
Fugitive dust	---	---	1.70	0.28
Total	9.89	30.73	2.73	1.23
SCAQMD Localized Significance Thresholds	667	118	4	3
Significant?	NO	NO	NO	NO
Pine Ave. Drain Construction - 2019	CO	NO_x	PM10	PM2.5
On-road vehicles	1.17	4.10	0.01	0.00
Off-road equipment	8.47	22.74	0.87	0.80
Fugitive dust	---	---	1.11	0.18
Total	9.64	26.85	1.99	0.99
SCAQMD Localized Significance Thresholds	667	118	4	3
Significant?	NO	NO	NO	NO

Source: Appendix 2; SCAQMD, 2015e

As shown above in Table 3.2-9 construction of the project would not exceed any of the SCAQMD CEQA LST significance thresholds, so the construction emissions impacts are less than significant (Class III).

The worst-case localized emissions case for construction is not the same as the worst-case regional emissions case as shown previously in Table 3.2-8. The regional emissions case is composed of all emissions sources that are active on a worst-case day within the air basin, while the localized emissions case is composed entirely of worst-case daily emissions estimated to occur during one day within one construction site.

Operation Localized Criteria Pollutant Emissions Impacts

The appropriate LSTs for project site operation were compared to the assumed reasonably foreseeable maximum localized on-site daily construction emissions in Table 3.2-10. The operation LST is based on a construction area of 5 acres and a conservative distance to receptor of 100 meters for basin sediment removal activities.

Table 3.2-10. Maximum Daily Localized Operation Emissions (lbs/day)

Sediment Removal	CO	NO_x	PM₁₀	PM_{2.5}
On-road vehicles	0.33	1.09	0.03	0.02
Off-road equipment	4.85	16.64	0.61	0.56
Fugitive dust	---	---	14.62	1.63
Total	5.18	17.73	15.26	2.21
SCAQMD Localized Significance Thresholds	4,142	378	16	5
Significant?	NO	NO	NO	NO

Source: Appendix 2; SCAQMD, 2015e

As shown above in Table 3.2-10 the project's operation and maintenance activities would not exceed any of the SCAQMD CEQA LST significance thresholds, so the operations emissions impacts are less than significant (Class III).

TAC Emissions Impacts

The proposed project's TAC emissions and health risk potential are primarily associated with the DPM emissions from the diesel-fueled off-road and on-road engines. The emissions of acutely hazardous pollutants from project emissions sources are negligible, so the primary potential health risk would be related to the carcinogenic and chronic risks from DPM exposure. However, the construction DPM emissions are low and the project's duration is short, so the construction emissions are not considered to be of concern in relation to the potential long-term health risk impacts from DPM exposure. Therefore, the proposed project's TAC emissions impacts would be less than significant (Class III).

Valley Fever

Valley Fever, or Coccidiomycosis, is an illness caused by a Southern California endemic fungus, *Coccidioides immitis* (*C. immitis*). Persons exposed to airborne *C. immitis* arthrospores may become infected with Valley Fever. The resulting infection is most likely to have no symptoms or present with mild cold-like symptoms, but it can cause flu-like symptoms, or in rare cases (one percent of persons infected) cause a disseminated form of the disease that can cause severe disabling illness or death. Earthmoving and other activities that cause fugitive dust emissions can cause *C. immitis* arthrospores, if present, to become airborne. The proposed project would require earthmoving; however, much of the temporary impact area (shown in Figure 3) would be within shoulders and adjacent to existing roadways that would not have been subject to long-term *C. immitis* fungal growth. Additionally, the project area has an average rainfall of approximately 40 inches, which is above the favorable range of rainfall associated with high levels of *C.*

immitis growth (Kolivras, et al., 2001). So, while there may be some limited potential for the *C. immitis* fungus to exist in the project area (primarily during earthmoving activities within the permanent impact area shown in Figure 3), the risk of project activities causing Valley Fever infection is considered low due to the characteristics of the project area. Impacts would be less than significant (Class III).

Greenhouse Gas Emissions

Thresholds of Significance

Appendix G of the CEQA Guidelines presents significance criteria that may be used by the lead agency to address and evaluate significance of an impact. According to these Guidelines, the following criteria may be used to establish the significance of GCC emissions (AEP, 2015).

Would the project:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. For industrial projects, a significance threshold of 10,000 metric tons of CO₂e emissions per year was determined. Construction GHG emissions are required to be included, amortized over the project life, in the project's annual GHG emissions totals.

In accordance with these guidelines, the proposed project would have significant GCC impacts if it would:

- *Criterion GCC1: Produce GHG emissions that exceed the SCAQMD CO₂e annualized significance threshold.*
- *Criterion GCC2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.*

Emissions Calculations Methodology

GHG emissions were calculated based on methodologies provided in *The Climate Registry – General Reporting Protocol* (TCR, 2013) (TCR Protocol), and emissions factors for the TCR Protocol updated in 2015 (TCR, 2015). The TCR Protocol is the guidance document that TCR members, which includes the State of California, use to prepare annual GHG inventories for the Registry. Direct GHG emissions would result from fuel use from the proposed construction activities. The project would not consume electricity and would consume very limited quantities of water, primarily for dust control; therefore, indirect GHG emissions would be negligible.

Criterion GCC1: Produce GHG emissions that exceed the SCAQMD CO₂e annualized significance threshold.

Impact GCC-1: The Project would produce GHG emissions that exceed the SCAQMD CO₂e annualized significance threshold (Class III)

The proposed project would generate GHG emissions through construction and operation and maintenance activities. The construction-phase GHG emissions would occur directly from the off-road heavy-duty equipment and the on-road motor vehicles needed to mobilize crew, equipment, and materials. The project would also create a small amount of indirect GHG emissions from water use and electricity use. The indirect GHG emissions for electricity use were calculated but there was no estimate for water use, so those indirect emissions were not calculated. The proposed project's operation and maintenance GHG emissions from off-

road equipment and on-road vehicle trips was also calculated. Per SCAQMD interim guidance for assessing industrial project impacts, the construction emissions are amortized over the project life, which is considered to be a 50-year period. Table 3.2-11 summarizes total annualized GHG emissions generated from project construction. The CO₂e emissions are compared against the SCAQMD interim threshold.

Table 3.2-11. Summary of Project Greenhouse Gas Emission Estimates

Emissions Source	Annual CO ₂ e, tons
Construction Emissions	
On-Road Emissions	296.03
Off-Road Emissions	443.77
Electricity Use	0.67
Total Emissions	740.48
Amortized Emissions (50 year-life)	14.81
Operation Emissions	
On-Road Emissions	11.26
Off-Road Emissions	14.61
Total Operation Emissions (3-year frequency)	25.87
Average Annual Operations Emissions	8.62
Total Annual Emissions	23.43
SCAQMD Significance Threshold	10,000
Exceeds Threshold?	NO

Source: Appendix 2; SCAQMD, 2015e

Table 3.2-11 shows that construction of the proposed project would have GHG emissions that are well below the SCAQMD GHG emissions significance criteria. Therefore, the project would have less-than-significant GHG emissions impacts and no mitigation is required (Class III).

Criterion GCC2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Impact GCC-2: The Project would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions (Class III)

Climate change is a global phenomenon, and the regulatory background and scientific data are changing rapidly. In 2006, the California state legislature adopted Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. A number of other federal, state, and local regulations, plans, and policies have been developed recently for the purpose of reducing GHG emissions.

A summary of the compliance with all potentially applicable GHG plans, policies, and regulations is provided in Table 3.2-12. The GHG emissions for the proposed project, as described above, are expected to be minimal during construction and operation. Furthermore, maintenance of the proposed project will not require the installation of new stationary sources of emissions. Therefore, the project is not subject to the federal and state mandatory reporting regulation, the federal 40 CFR Part 52 permitting regulation, or the State Cap-and-Trade regulations.

Table 3.2-12. Project Consistency with Potentially Applicable Plans, Policies, and Regulations for GHG Emissions

Adopted Plan, Policy, or Regulation	Consistency Determination	Proposed Project Consistency
Federal		
40 CFR Part 98. Mandatory Reporting of Greenhouse Gases Rule.	Not Applicable	The project would not have emissions sources that would be subject to this regulation.
40 CFR Part 52. Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule.	Not Applicable	The project would not have emissions sources that would be subject to this regulation.
State		
AB 32. Annual GHG Emissions Reporting	Not Applicable	The project does not include emissions sources that would be subject to this regulation.
AB 32. Cap-and-Trade	Not Applicable	The project does not include emissions sources that would be subject to this regulation.
Local		
San Bernardino County Greenhouse Gas Emissions Reduction Plan (SBC, 2011)	Consistent	The project would not exceed the review standard threshold of 3,000 MT CO ₂ e per year and is not subject to the County's performance standards for development or commercial projects.

The project-related construction sources for which GHG emissions were calculated include off-road diesel construction equipment, on-road trucks, and worker commute vehicles. Per the San Bernardino County Greenhouse Gas Emissions Reduction Plan guidance for assessing project impacts, the construction emissions are amortized over the project life (50-year project life is assumed) in order to determine their contribution to annual emissions over the lifetime of the project. Table 3.2-13 indicates that the annualized GHG emissions are well below the San Bernardino GHG Emissions Reduction Plan review standard threshold of 3,000 MT CO₂e per year.

Table 3.2-13. Annual Greenhouse Gas Emission Estimates

	CO ₂ e, metric tons
Total Annual Average Construction and Operation Emissions	23.43
SBC GHG Emissions Reduction Plan Review Standard Threshold	3,000
Exceeds Threshold?	NO

Source: Appendix 2, SBC, 2011.

Table 3.2-14 identifies current potentially applicable California emission reduction strategies to reduce GHGs and identifies the project design feature or mitigation measure that is proposed to comply with these potentially applicable strategies.

Table 3.2-14. Potentially Applicable California GHG Reduction Strategies

Strategy	Project Design/Mitigation to Comply with Strategy
Vehicle Climate Change Standards	These are ARB enforced standards; vehicles that access the project that are required to comply with the standards would comply with these strategies.
Other Light Duty Vehicle Technology	
Heavy-Duty Vehicle Emission Reduction Measures	
Diesel Anti-Idling	
Construction and Demolition Waste Reduction	The construction wastes from this project will be reduced through the reuse of materials (dirt and rock) to the extent possible and there will be no concrete or metal wastes to recycle from this project.
Increase Water Use Efficiency	Not directly applicable to the proposed project. The water use for the project is short-term and limited to that required for fugitive dust control and worker safety.

Source: OPR, 2008; CAPCOA, 2009.

The Office of the California Attorney General maintains a website with a list of CEQA Mitigations for Global Climate Change Impacts (OAG, 2015). The Attorney General has listed some examples of types of mitigations that local agencies may consider to offset or reduce global climate change impacts from a project. The Attorney General stresses that the presented lists are examples of measures and policies that could be implemented, and are not intended to be exhaustive. Moreover, the measures cited may not be appropriate for every project, so the Attorney General suggests that the lead agency use its own informed judgment in deciding which measures it would analyze, and which measures it would require, for a given project.

The Attorney General suggests energy efficiency measures that could be undertaken or funded by a diverse range of projects, including: renewable energy, water conservation and efficiency, solid waste measures, land use measures, transportation and motor vehicles, and carbon offsets. However, most of the suggested measures would not be applicable to the proposed project because they are more appropriate as measures to reduce long-term operation GHG emissions.

In summary, the proposed project would conform to state and local GHG emissions/climate change regulations and policies/strategies; therefore, the proposed project would have less-than-significant GHG impacts and no mitigation is required (Class III).

3.2.4 Level of Significance After Mitigation

Air Quality

Air quality impacts are less than significant and require no mitigation (Class III).

Greenhouse Gas Emissions

Greenhouse gas emissions impacts are less than significant and require no mitigation (Class III).

3.3 Biological Resources

This section describes the biological resources on the Rimforest Storm Drain Project site, identifies the environmental and regulatory setting for the construction and operation of the proposed project, evaluates potential impacts to biological resources, and recommends measures to mitigate impacts below a level of significance as needed.

3.3.1 Environmental Setting

The project site located in the San Bernardino Mountains in the unincorporated community of Rimforest. The attenuation basin(s) portion of the project is located on private land and the other project components are located on County road rights-of-way and other unincorporated county land. Land use within the attenuation basin(s) portion of the project site is primarily open space while most of the storm drain alignment is within commercial and residential development. The potential staging area at the west end of the project site is primarily disturbed open space.

Elevation of the project site ranges from approximately 5,400 to 5,700 feet above sea level and the topography varies from relatively flat along the storm drain alignment to a steeper north-sloping canyon at the north end of the attenuation basin(s). There is a spring near the southern end of the attenuation basin(s) where perennial water begins flowing north through the project site. The water eventually leaves the site and continues north in Little Bear Creek down Daley Canyon, through the community of Blue Jay and eventually into Lake Arrowhead. Storm flows originate on SR-18 and flow into the project site, through an incised sandy wash, past the spring, and then follow the route of the perennial flows. The project site is in Township 2 North, Range 3 West, Sections 29 and 30, as shown on the Harrison Mountain 7.5-minute USGS topographic quad.

The San Bernardino Mountains are part of the Transverse Ranges, running generally east-west for about 55 miles. Maximum elevation is about 11,500 feet at Mount San Gorgonio, the highest peak in southern California. The terrain is rugged, with chaparral and shrubland at the lower elevations transitioning to mixed conifer and hardwood forest and conifer forest at the higher elevations. The climate of the mountains is characterized by warm, dry summers and cold, wet winters. Spring and fall are typically cool and wet; fog is common. Average temperatures in the area range from mid-30s in the winter to high 60s in the summer. Precipitation occurs mainly from late fall through early spring; snow is common at the higher elevations. Average annual precipitation is about 40 inches (WRCC, 2015).

Methods

For the purposes of biological resource surveys and analysis, the project site is defined as the storm drain alignment, attenuation basin(s), staging areas, utility relocations, and all other permanent and temporary impact areas. The project vicinity is defined as the area within five miles of the project site.

Prior to the biological reconnaissance survey, biologist Justin M. Wood of Aspen Environmental Group (Aspen) reviewed available literature to identify special-status biological resources known from the vicinity of the project site. The literature and databases listed below were reviewed:

- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CDFW, 2015a) for the following 7.5-minute USGS topographic quads: Lake Arrowhead, Harrison Mountain, San Bernardino North, and Silverwood Lake.

- California Native Plant Society (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2015), for the topographic quads listed above.
- CDFW Special Animals List (CDFW, 2015b).
- The Jepson (2015) eFlora database of California plants.
- Aerial and street-level photographs (Google, 2015).
- Biological Resources Reports for Church of the Woods Development (County of San Bernardino Land Use Services Department, 2010; Appendix C).
 - Habitat Re-assessment for the Southern Rubber Boa (PCR, 2007a)
 - Results of a Trapping Program for San Bernardino Flying Squirrel (PCR, 2007b)
 - California Spotted Owl Survey (TES, 2007)
 - Results of a Wetland/Jurisdictional Delineation Study for Tentative Parcel Map No. 16155 (TLC, 2005)
 - California Spotted Owl Survey on APN 336-101-006 (BRC, 2005).
 - Opinion Regarding Absence of Southern Rubber Boa from TPM 16155 (TLC, 2003a).
 - Results of Focused 2003 Botanical Surveys Performed on Tentative Parcel Map No. 16155. (TLC, 2003b).
 - 2003 Results of an Andrew's Marble Butterfly Habitat Assessment (TLC, 2003c).
 - Results of 2003 California Spotted Owl Protocol Surveys (TLC, 2003d).
 - Results of a 2003 Mountain Yellow-legged Frog Habitat Assessment (TLC, 2003e).
 - White-eared Pocket Mouse Trapping Survey Church of the Woods, Rimforest, California. (ENVIRA, 2003).
 - Results of a Focused Southern Rubber Boa Surveys (TLC, 2002a).
 - Results of a Mountain Yellow-legged Frog Habitat Assessment (TLC, 2002b).
 - Results of a Biological Constraints Analysis of APN 336-101-006 and APN 336-101-007 (TLC, 2001a).
 - Results of California Spotted Owl Protocol Surveys (TLC, 2001b).
 - Results of an Andrew's Marble Butterfly Habitat Assessment (TLC, 2001c).

Based on review of the literature and databases listed above, and on local expertise with the flora and fauna of the San Bernardino Mountains, lists of special-status plants (Table 3.3-2) and wildlife (Table 3.3-3) with potential to occur on the project site or in the project vicinity were compiled. Plant and wildlife taxa were considered to be special-status species if they were classified in one or more of the categories listed in Table 3.3-1.

Table 3.3-1. Definitions of Special-Status Species

Species Designation	Agency	Definition
Federal Endangered	USFWS	A species that is in danger of extinction throughout all or a significant portion of its range.
Federal Threatened	USFWS	A species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
Federal Candidate	USFWS	A species the US Fish and Wildlife Service (USFWS) has designated as a candidate for listing under Section 4 of the federal Endangered Species Act (ESA), published in its annual candidate review, and defined as a species that has sufficient information on its biological status and threats to propose it as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.
Federal Proposed	USFWS	A species that the USFWS has proposed for listing under Section 4 of the ESA, by publishing a Proposed Rule in the Federal Register.
Protected under the federal Bald and Golden Eagle Protection Act (BGEPA)	USFWS	Bald and golden eagles are protected from take, including harassment, except as permitted by USFWS.
State Endangered	CDFW	A species that is in serious danger of becoming extinct throughout all or a significant portion of its range due to one or more causes, including loss or change in habitat, overexploitation, predation, competition, or disease.
State Threatened	CDFW	A species that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.
State Candidate	CDFW	A species that has been officially noticed by the California Fish and Game Commission as being under review by the CDFW for addition to the threatened or endangered species lists. CDFW candidate species are given no extra legal protection under state laws.
Fully Protected	CDFW	Animal species fully protected under the California Fish and Game Code. The CDFW may not issue take authorization except for scientific purposes or as provided under SB 618 (2011).
Species of Special Concern	CDFW	<p>A species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:</p> <ul style="list-style-type: none"> Is extirpated from the state or, in the case of birds, in its primary seasonal or breeding role; Is on the federal, but not state list, of threatened or endangered species; Meets the state definition of threatened or endangered but has not formally been listed; Is experiencing or formerly experienced serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status; or Has naturally small populations exhibiting high susceptibility to risk from any factor(s) that if realized, could lead to declines that would qualify it for state threatened or endangered status. <p>This is an administrative designation and carries no formal legal status. This designation is intended to focus attention on animals at conservation risk, to stimulate research on poorly known species, and to achieve conservation and recovery before these species meet the California Endangered Species Act (CESA) criteria for listing. California Species of Special Concern are considered under the California Environmental Quality Act (CEQA) and require a discussion of impacts and appropriate mitigation to reduce impacts.</p>

Table 3.3-1. Definitions of Special-Status Species

Species Designation	Agency	Definition
Watch List	CDFW	Taxa that were previously Species of Special Concern, but no longer merit that status or which do not meet criteria for designation as Species of Special Concern, but for which there is concern and a need for additional information to clarify status.
Special Animal	CDFW	An animal species that is tracked in the CNDDB, but has no other status at the state or federal level.
California Rare Plant Rank (CRPR) 1A	CDFW	Plants presumed to be extinct in California.
CRPR 1B	CDFW	Plants rare or endangered in California and elsewhere.
CRPR 2A	CDFW	Plants presumed extinct in California but more common elsewhere.
CRPR 2B	CDFW	Plants rare or endangered in California but more common elsewhere.
CRPR 3	CDFW	Plants about which more information is needed – a review list.
CRPR 4	CDFW	Plants of limited distribution – a watch list.

A biological survey of the project site was conducted by biologists Justin Wood and Jared Varonin of Aspen on July 6, 2012. Wood conducted additional reconnaissance surveys on May 28 and June 11, 2014 and June 19, 2015. Wood and Varonin also delineated State and federally jurisdictional features of the project site on April 2, 2015. Wood and Patrick Meddaugh of Aspen conducted a habitat assessment, stream sampling, and species inventory of Strawberry Creek and lower Twin Creek on February 10, 2016. During all surveys a species list of all plants and animals was maintained. Taxonomic conventions for plants follow Jepson eFlora (2015) and a Complete List of Amphibian, Reptile, Bird, and Mammal Species in California (CDFG, 2008) for wildlife.

During the biological survey, vegetation was mapped using a Trimble Juno 3B GPS unit and identified on aerial photographs. Field maps were digitized using Geographic Information Systems (GIS) and field verified at the project site. The smallest mapping units were approximately 0.10 acre and most mapped vegetation boundaries are accurate to within approximately 5 feet. Any vegetation map is subject to imprecision for several reasons including: vegetation types tend to intergrade on the landscape so that there are no true boundaries in the vegetation itself, vegetation types as they are named and described tend to intergrade; and vegetation tends to be patchy, so depending on minimum mapping units some patches may or may not be included. Vegetation nomenclature follows A Manual of California Vegetation, Second Edition (Sawyer et al., 2009) with references to the Preliminary Description of the Terrestrial Natural Communities of California (Holland, 1986) whenever applicable.

During the jurisdictional delineation, hydrology was mapped using a Trimble Juno 3B GPS unit and identified on aerial photographs. Field maps were digitized using GIS and field verified at the project site. Non-wetland “waters of the U.S.” were delineated based on the limits of the ordinary high water mark (OHWM) as determined by changes in physical and biological features, such as bank erosion, deposited vegetation or debris, and vegetative characteristics. Jurisdictional wetlands were delineated using a routine determination according to the methods outlined in the USACE Wetland Delineation Manual (1987) and the Arid West Supplement (2008) based on three wetland parameters: dominant hydrophytic vegetation, wetland hydrology, and hydric soils. CDFW jurisdiction was delineated to the top of the banks

of the channel and/or to the edge of the riparian canopy/riparian habitat. For portions of the project site, the CDFW jurisdictional boundary mirrors the OHWM. In some areas, the riparian canopy/riparian habitat extends beyond the OHWM. Therefore, the total acreage of CDFW jurisdictional waters is greater than the combined acreage of federal jurisdictional waters/wetlands.

After vegetation and hydrology data had been collected, GIS files with the permanent and temporary impacts from the project were overlaid to determine the temporary, permanent, and total impacts to each vegetation type and jurisdictional feature. These are presented below in Impact BIO-2 for vegetation and Impact BIO-3 for hydrology. The temporary and permanent impact acreages provided are independent from one another.

During the downstream habitat assessment and stream sampling in Strawberry Creek and lower Twin Creek, a Trimble Juno 3B GPS unit was used to record sampling locations. General notes on habitat suitability throughout the downstream assessment area were recorded. Detailed stream measurements were recorded at seven sampling transects located throughout the downstream assessment area. Numerous parameters were measured and recorded in accordance with portions of the Surface Water Ambient Monitoring Program (SWAMP), a California stream bioassessment protocol (Ode, 2007). Surface flow depth, width, and velocity was also recorded and later used to determine flow velocity at the seven locations. This flow data was then used to model the hydrology of the watershed and is presented in Section 3.6 (Hydrology and Water Quality).

Results

Vegetation and Other Cover Types

The storm drain alignment crosses residential and commercial development where little vegetation is present. Vegetation on the attenuation basin(s) portion of the project site is dominated by mixed hardwood and coniferous forests as defined and further described below. The forest has a relatively open understory with a diverse assemblage of annuals, perennials, and shrubs. There is a dense riparian corridor dominated by dogwood trees. There is a small dry sandy meadow just upstream of the riparian corridor that supports some scattered willow trees and is mapped as arroyo willow thickets. Vegetation and other cover types in the project site are shown on Figure 3.3-1 and described below.

White Fir–Sugar Pine Forest (*Abies concolor* – *Pinus lambertiana* Forest Alliance). The most common vegetation on the project site is white fir – sugar pine forest. The dominant species are white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), and sugar pine (*Pinus lambertiana*). Other tree species that present include Jeffrey pine (*Pinus jeffreyi*), Coulter pine (*Pinus coulteri*), and black oak (*Quercus kelloggii*). Understory species include bracken fern (*Pteridium aquilinum* var. *pubescens*), wax currant (*Ribes cereum*), and numerous annuals and perennials. Some portions of the site better match descriptions of Jeffrey pine forest (*Pinus jeffreyi* Forest Alliance) in Sawyer et al. (2009) but they were too small and interspaced within the white fir- sugar pine forest to delineate. This vegetation best matches the descriptions of upper montane mixed coniferous forest and Jeffrey pine forest in Holland (1986).

Red Osier Thickets (*Cornus sericea* Shrubland Alliance). This vegetation is found in the wettest portions of the project site, found in north-sloping canyon bottom. It is dominated by American dogwood (*Cornus sericea*) which is also known as red osier. The American dogwoods are greater than twenty feet in height and form a dense continuous canopy for several hundred feet down the canyon and continuing out of the Project site to the north. Other species present are mountain dogwood (*Cornus nuttallii*), thimbleberry (*Rubus parviflorus*) and mountain pink currant (*Ribes nevadense*). This vegetation matches the description

of montane riparian forest and southern mixed riparian forest in Holland (1986), which are classified as sensitive natural communities (CDFW, 2015a).

Arroyo Willow Thickets (*Salix lasiolepis* Shrubland Alliance). This vegetation is found primarily in the dry sandy meadow that lies just upstream of the attenuation basin(s) location. Arroyo willow (*Salix lasiolepis*) is the dominant species, although it has relatively sparse tree cover, with other species such as Mexican elderberry (*Sambucus nigra* ssp. *cerulea*), Douglas mugwort (*Artemisia douglasiana*), mountain pink currant, numerous sedges (*Carex* spp.), and grasses (*Elymus* spp. and *Bromus* spp.) also present. Within the dry meadow there is an incised, largely unvegetated channel that was too narrow to map. This vegetation matches the description of both southern willow scrub southern arroyo willow riparian forest in Holland (1986).

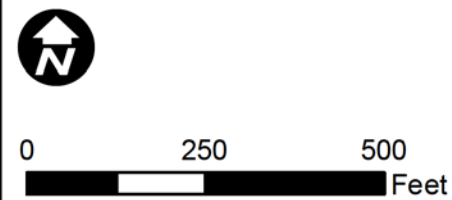
California Black Oak Forest (*Quercus kelloggii* Forest Alliance). This vegetation is found at the west end of the storm drain alignment and also just south of the attenuation basin(s). It is dominated by black oak (*Quercus kelloggii*) with other trees such as California bay (*Umbellularia californica*) and incense cedar also present. The understory is dominated by bracken fern and numerous other perennial and annuals. This vegetation best matches the description of black oak forest in Holland (1986). Trees within and adjacent to this vegetation were thinned to reduce fuel load in 2004 (County of San Bernardino Land Use Services Department, 2010).

Developed. This unvegetated land cover was used to classify areas that are developed or disturbed and lack natural vegetation. Within the project site, these areas include residential and commercial buildings, paved roads, and asphalt parking areas. There are scattered large trees around the buildings and roadways, but otherwise the only plants are ruderal weedy species and ornamental species.

Sensitive Natural Communities

Two sensitive natural communities are present on the project site: Southern Arroyo Willow Riparian Forest and Southern Mixed Riparian Forest. The areas mapped as Arroyo Willow Thickets meet the definition of the Southern Arroyo Willow Riparian Forest and the Red Osier Thickets meet the definition of Southern Mixed Riparian Forest. Both of these natural communities have a state rank of S2, indicating the community occupies between 2,000 and 10,000 acres in the state and is considered rare in California (CDFG, 2010). These vegetation communities are described above.

In addition, several sensitive natural communities are present in the downstream assessment area on Strawberry Creek and Little Bear Creek. These include areas of Southern Arroyo Willow Riparian Forest and Southern Mixed Riparian Forest as described above. California Sycamore Woodland and Bigcone Douglas Fir Forest were both present in the downstream assessment area. Both of these natural communities have a state rank of S3, indicating that they are considered rare in California (CDFG, 2010).










Cover Type		
	Arroyo willow thickets	 Developed
	California black oak forest	 Red osier thickets
		 White fir-sugar pine forest
		 Permanent Impact Area
		 Temporary Disturbance Area

Figure 3.3-1

Vegetation and Cover Type

Special-Status Plants

Table 3.3-2 lists the special-status plant species from the region and summarizes their habitat and distribution, conservation status, and potential for occurrence on the project site. The potential for occurrence of each species is assessed based on the following criteria, but may be modified based on professional judgement of the surveying biologist:

- **Present:** Observed on the project site during surveys or previously documented on the project site.
- **High:** Documented in the project vicinity (within about 5 miles) and suitable habitat found on the project site, but not detected on the project site during project-specific biological surveys.
- **Moderate:** Either documented in the project vicinity (within about 5 miles), or suitable habitat found on the project site and the project site is within species' geographic range.
- **Low:** There are no records in the project vicinity (within about 5 miles), the habitat is marginal, or the species is conspicuous and was not detected during biological surveys.
- **Minimal:** There are no records in the project vicinity (within about 5 miles) and the site lacks suitable habitat.

A list of species considered, but determined to be unlikely to occur in the project site is included in Appendix 3b along with the rationale for rejecting these species.

Table 3.3-2. Special-Status Plants of the Rimforest area.

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Bear Valley checkerbloom <i>Sidalcea malviflora</i> ssp. <i>dolosa</i>	Fed: none Calif: 1B.2	Perennial herb; meadows and seeps in riparian woodlands and coniferous forests. Restricted to the San Bernardino Mts., about 4900-8800 ft. elev.	May–August	Minimal. Marginally suitable habitat, west of nearest known occurrence by 4 mi, not observed.
Common woolly sunflower <i>Eriophyllum lanatum</i> var. <i>obovatum</i>	Fed: none Calif: 4.3	Perennial herb; coniferous forests in the San Bernardino Mts., about 3650-8200 ft. elev.	June–July	Present. Suitable habitat present, observed on the project site.
Hall's monardella <i>Monardella macrantha</i> ssp. <i>hallii</i>	Fed: none Calif: 1B.3	Perennial herb; chaparral, hardwood & coniferous forest, and grasslands in S. Calif. mts., 2395-7200 ft. elev.	June–October	Low. Suitable habitat present, nearest record roughly 4.5 mi SE of project site, not observed.
Laguna Mountains jewelflower <i>Streptanthus bernardinus</i>	Fed: none Calif: 4.3	Annual or perennial herb; chaparral, hardwood & coniferous forest, about 3900-8100 ft. elev.; mts. of S Calif. (gen. W. half of San Bernardino Mts.).	May–July	Present. Suitable habitat present, observed growing on the project site.
Lemon lily <i>Lilium parryi</i>	Fed: none Calif: 1B.2	Perennial bulb; meadows and seeps in riparian and coniferous forests in S. Calif. mts., 4000-9000 ft. elev.	July–August	Low. Marginal suitable meadow or seep habitat, nearest known occurrence 6 mi. to the east.
Mojave phacelia <i>Phacelia mohavensis</i>	Fed: none Calif: 4.3	Annual; sandy or gravelly soil; dry meadows and streambeds gen. within pine forest in the San Gabriel & San Bernardino Mts., about 4500-8100 ft. elev.	April–August	High. Suitable habitat present, records from within 0.5 mi., not observed.

Table 3.3-2. Special-Status Plants of the Rimforest area.

Species	Status	Habitat and Distribution	Blooming Period	Potential to Occur
Palmer's mariposa-lily <i>Calochortus palmeri</i> var. <i>palmeri</i>	Fed: none Calif: 1B.2	Perennial bulb; meadows and seeps in chaparral and coniferous forest in S. Calif. mts., about 3280-7840 ft. elev.	April–July	Low. Marginal suitable meadow or seep habitat, known from 5 m. north of the project site.
Parish's alumroot <i>Heuchera parishii</i>	Fed: none Calif: 1B.3	Perennial herb; rocky areas in coniferous forests and alpine rock fields of the San Bernardino Mts., about 4400-12450 ft. elev.	June–August	Low. Minimal suitable habitat present, very few records in the Project vicinity, known within 3 mi. of project site.
Parish's yampah <i>Perideridia parishii</i> ssp. <i>parishii</i>	Fed: none Calif: 2B.2	Perennial herb; meadows and seeps in coniferous forests of the San Bernardino Mts., about 4800-9800 ft. elev.	June–August	Moderate. Marginally suitable meadow or seep habitat, known within 0.5 mi., not observed.
Plummer's mariposa-lily <i>Calochortus plummerae</i>	Fed: none Calif: 4.2	Perennial herb; chaparral, cismontane woodland, coastal scrub, coniferous forests, and grasslands; granitic and rocky areas; much of cismontane S. Calif., about 330-5600 ft. elev.	May–July	Low. Minimally suitable habitat present, records from project vicinity, not observed.
San Bernardino aster <i>Symphotrichum defoliatum</i>	Fed: none Calif: 1B.2	Perennial herb; meadows, seeps, springs, and other wet areas in coastal scrub, grasslands, chaparral and woodlands throughout S. Calif., sea level to 6600 ft. elev.	July–November	Minimal. Marginally suitable habitat present, no recent records in project vicinity, not observed.
San Bernardino Mountains owl's-clover <i>Castilleja lasiorhyncha</i>	Fed: none Calif: 1B.2	Annual; meadows, seeps, and pebble plains in chaparral, coniferous forest, and riparian woodlands of the San Bernardino Mts., about 4200- 7800 ft. elev.	May–August	Moderate. Marginally suitable habitat present, reported from vicinity, not observed.
Silver-haired ivesia <i>Ivesia argyrocoma</i> var. <i>argyrocoma</i>	Fed: none Calif: 1B.2	Pebble plains, seasonal meadows and drainages in the San Bernardino Mts. and one site in Baja Calif., about 4900-8800 ft. elev.	June–August	Moderate. Marginally suitable habitat, known from within 0.5 mi. of the project site, not observed.
Southern jewelflower <i>Streptanthus campestris</i>	Fed: none Calif: 1B.3	Generally a biennial herb; shrublands, forests, woodlands, often rocky sites S. Calif. mts., about 2900 -7600 ft. elev.	May–July	Moderate. Suitable habitat present, not observed on the project site.
Southern mountains skullcap <i>Scutellaria bolanderi</i> ssp. <i>austromontana</i>	Fed: none Calif: 1B.2	Perennial herb; mesic habitats in chaparral, coniferous forests, and cismontane woodland in S. Calif. mts., about 1400-6500 ft. elev.	June–August	Low. Marginal habitat present, known from one location in SB Mtns. over 7 miles NW, not observed.

Source: Baldwin et al., 2012; CDFW, 2015a; CNPS, 2015.

Status Codes

US Fish and Wildlife Service (Fed.) Designations:

END: Federally listed, endangered.

THR: Federally listed, threatened.

Cand. Candidate: Sufficient data available to support Federal listing, but not yet listed.

Prop. Proposed: Candidate species found to warrant listing as either threatened or endangered and officially proposed as such in a Federal Register notice after the completion of a status review and consideration of other protective conservation measures.

BGEPA: Bald and Golden Eagle Protection Act.

California Department of Fish and Wildlife (Calif.) Designations:

END: State listed, endangered.

THR: State listed, threatened.

SCand. Candidate for state listing.

SC: Species of Special Concern: Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.

FP: Fully protected. May not be taken or possessed without permit from CDFW. Also includes protected furbearers.

SA: Special Animal: An animal species that is tracked in the CNDDB, but has no other status at the state or federal level.

California Rare Plant Rank (CRPR) designation

1A Plants presumed extinct in California.

1B Plants rare, threatened, or endangered in California and elsewhere.

2 Plants rare, threatened, or endangered in California, but more common elsewhere.

3 Plants about which we need more information – a review list.

4 Plants of limited distribution – a watch list.

.1 Seriously threatened in California (high degree/immediacy of threat).

.2 Fairly threatened in California (moderate degree/immediacy of threat).

.3 Not very threatened in California (low degree/immediacy of threats or no current threats known).

CNDDB California State (S) Ranks

S1 Extremely endangered: <6 viable occurrences (EOs) or < 1,000 individuals, or 2,000 acres of occupied habitat.

S2 Endangered: about 6-20 EOs or 1-3,000 individuals, or 2,000-10,000 acres of occupied habitat.

S3 Restricted Range, rare: about 21-100 EOs or 3,000-10,000 individuals, or 10,000-50,000 acres of occupied habitat.

S4 Apparently Secure: some factors exist to cause some concern such as narrow habitat or continuing threats.

S5 Demonstrably Secure: commonly found throughout its historic range.

A question mark may be added to S ranks to indicate there is some uncertainty as to status.

Listed Threatened or Endangered Plant Species. Federally or state-listed threatened or endangered plant species were not observed on the project site during the field survey. There is no potential habitat for listed plant species on the project site because all listed species of the San Bernardino Mountains are restricted to carbonate soils, pebble-plain, alkali lake beds, or mesic montane meadows, primarily in the eastern half of the San Bernardino Mountains. There are no carbonate soils or pebble-plain on the project site and the nearest occurrences of these habitats are well over ten miles to the east. The listed meadow species are restricted to meadow habitats that are much further east of the project site and are not known from meadows in the vicinity of the project (CDFW, 2015a). The project site is not within designated critical habitat for any federally listed threatened or endangered plant species.

Other Special-Status Plant Species. Two special-status plants, each with a CRPR of 4, were observed on the project site during surveys. These are common woolly sunflower (*Eriophyllum lanatum* var. *obovatum*) and Laguna Mountains jewelflower (*Streptanthus bernardinus*). The common woolly sunflower was reported by (County of San Bernardino Land Use Services Department, 2010) but was not observed during the most recent surveys. It is probably still present in low numbers within the project site. Laguna Mountains jewelflower was observed at a few locations along Little Bear Creek in Daley Canyon within and immediately adjacent to the project site.

Three additional plant species with a CRPR 1B have a moderate potential to be present on the project site: San Bernardino Mountains owl's-clover (*Castilleja lasiorhyncha*), southern jewelflower (*Streptanthus campestris*), and silver-haired ivesia (*Ivesia argyrocoma* var. *argyrocoma*). In addition, Parish's yampah (*Perideridia parishii* ssp. *parishii*), a CRPR 2, and Mojave phacelia (*Phacelia mohavensis*), CRPR 4, are known from the immediate vicinity and may be present on the project site. There is suitable habitat for several additional special-status plant species; however, their likelihood of occurrence is either low or minimal; see Table 3.3-2.

Common Wildlife

Common wildlife species found on the project site include reptiles such as western fence lizards (*Sceloporus occidentalis*) and Southern alligator lizard (*Elgaria multicarinatus*); birds such as Stellar's jay (*Cyanocitta stellari*), common raven (*Corvus corax*), mountain chickadee (*Parus gambeli*), American robin (*Turdus migratorius*), dark-eyed junco (*Junco hyemalis*), and house finch (*Carpodacus mexicanus*); and small mammals such as deer mouse (*Peromyscus maniculatus*) and western gray squirrel (*Sciurus griseus*). Larger mammals such as mule deer (*Odocoileus hemionus*) and black bear (*Ursus americanus*) probably forage on the project site. Common passerines (perching birds) are likely to nest in trees and shrubs on the project site. Common bat species may roost in the trees or snags within the project site.

Nesting Birds

Nesting birds are protected under the federal Migratory Bird Treaty Act and California Fish and Game Code. The project site has many trees, shrubs, and some rocky outcrops, as well as buildings (i.e., homes and other structures along the storm drain alignment) that may provide nesting habitat. At this elevation, most birds start nesting in April or May. Several active bird nests were observed on the project site including mountain chickadees and dark-eyed juncos. One special-status bird species, California spotted owl, may nest in more secluded portions of the project site (TES, 2007).

Special-Status Wildlife

Table 3.3-3 lists the special-status wildlife species known from the region and summarizes their habitat, conservation status, and potential for occurrence on the project site. The potential for occurrence is assessed based on the same criteria as listed under *Special-Status Plants* above. A list of special-status wildlife considered, but determined to be unlikely to occur in the project site is included in Appendix 3b along with the rationale for excluding each species from further discussion.

Table 3.3-3. Special-Status Wildlife Potentially Occurring on the Project Site

Species	Status	Habitat	Potential to Occur
INVERTEBRATES			
Andrew's marble butterfly <i>Euchloe hyantis andrewsi</i>	Fed: none Calif: SA, S1	Shrubland, woodland, about 5000-6000 ft. elev.; endemic to San Bernardino Mtns.; several mustard family larval food plants.	High. Two larval food plants are present. Type locality nearby.
FISHES			
Santa Ana sucker <i>Catostomus santaanae</i>	Fed: THR Calif: SC	Endemic to the Los Angeles, San Gabriel, and Santa Ana Rivers; habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, and algae.	Minimal. Believed extirpated from the upper Santa Ana River, last documented in 1982 in City Creek. Suitable habitat present in the upper Strawberry Creek watershed, south of project site. No suitable habitat on the project site.
Arroyo chub <i>Gila orcuttii</i>	Fed: none Calif: SC	Major cismontane stream systems in S Calif. incl. Santa Ana River; extant populations near Riverside and down-stream. Introduced into various sites in CA outside its native range, including the Mojave River where it has hybridized with the Mohave tui chub. Prefers slow water stream sections with mud or sand bottom.	Minimal. Populations in the Mojave River and tributaries are introduced. Known to occur in several tributaries to the Santa Ana River, but not currently known from the Twin Creek watershed. Suitable, but unfavorable, habitat is present in the upper Strawberry Creek watershed south of project site. No suitable habitat on the project site.

Table 3.3-3. Special-Status Wildlife Potentially Occurring on the Project Site

Species	Status	Habitat	Potential to Occur
Santa Ana speckled dace <i>Rhinichthys osculus</i> spp. 3	Fed: none Calif: SC	Headwaters of the Santa Ana and San Gabriel Rivers; requires permanent flowing streams with temperatures between 17-20 degrees C; usually inhabits shallow cobble and gravel riffle.	Minimal. Occured in upper Strawberry Creek and Twin Creek watersheds south of project site until 2005. Now considered extirpated from the watershed. No suitable habitat on the project site.
AMPHIBIANS			
California red-legged frog <i>Rana draytonii</i>	Fed: THR Calif: SC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation; requires 11-20 weeks of permanent water for larval development; must have access to aestivation habitat.	Minimal. Most recent occurrence (1988) along west fork City Creek. Many occurrences in southern California have been extirpated. Suitable habitat may be present in the upper Strawberry Creek watershed south of the project site. No suitable deep water habitat on the project site.
San Gabriel slender salamander <i>Batrachoseps gabrieli</i>	Fed: none Calif: SA, S2	Mesic canyons and talus slopes, cismontane San Gabriel and San Bernardino Mtns; about 3000 - 5000 ft. elev.	Low. Occurs in Waterman Canyon roughly 3.5 miles W of project site, marginally suitable habitat present.
Southern mountain yellow-legged frog <i>Rana muscosa</i>	Fed: END Calif: END	Inhabit perennial mountain streams (i.e. streams that contain plunge pools or backwaters year-round) with steep gradients; found at moderate to high elevations; tadpoles may require 2-4 years to complete their aquatic development.	Minimal. Few occurrences in region, restricted to City Creek in the SB Mtns, suitable habitat present in the upper Strawberry Creek watershed south of the project site. No suitable habitat on the project site.
REPTILES			
Coast horned lizard <i>Phrynosoma blainvillii</i>	Fed: none Calif: SC	Forest, shrubland or grassland with sandy areas; W Calif. from LA Co. S through Baja Calif., below ±6000 ft. elev.	Low. Very limited suitable habitat present.
San Bernardino Mountain kingsnake <i>Lampropeltis zonata parvirubra</i>	Fed: none Calif: SC	Forests and chaparral with rock outcrops or talus, often riparian, about 1200 – 8100 ft. elev.; San Gabriel, San Bern, San Jacinto Mtns.	High. Suitable habitat present, not observed, known from the area.
San Bernardino ringneck snake <i>Diadophis punctatus modestus</i>	Fed: none Calif: SA, S2?	Gen. open, rocky areas; woodlands, shrublands, grasslands below about 7000 ft. elev.; Ventura, LA, Orange, SW San Bern. & W Riverside Cos.	High. Suitable habitat present, records in project vicinity, not observed.
Silvery legless lizard <i>Anniella pulchra pulchra</i> (<i>Anniella stebbinsi</i>)	Fed: none Calif: SC	Mtns and valleys, Bay Area to N Baja (excluding desert); shrublands and woodlands, loose soils and leaf litter, below about 6500 ft. elev.	High. Suitable habitat present, not observed; no records in project vicinity, but species is highly cryptic.
Southern rubber boa <i>Charina umbratica</i>	Fed: none Calif: THR	Montane forest and woodland; Mt. Pinos, San Bernardino and San Jacinto Mtns; usually cool, moist areas w/ deep rocky crevices (no records in San Gabriel Mtns but habitat and elev. seem suitable).	High. Suitable habitat present, not observed; one record from within 0.5 miles of the project site (CNDDB, 2015).

Table 3.3-3. Special-Status Wildlife Potentially Occurring on the Project Site

Species	Status	Habitat	Potential to Occur
Two-striped garter snake <i>Thamnophis hammondi</i>	Fed: none Calif: SC	Highly aquatic; found in or near permanent fresh water; often along streams with rocky beds and riparian growth	Moderate. This species is known from most of the creeks along the cismontane slope of the San Bernardino Mts. Suitable habitat present and species is likely to occur in upper Strawberry Creek watershed south of the project site. Intermittent creek on project site provides marginally suitable habitat.
BIRDS			
American peregrine falcon <i>Falco peregrinus anatum</i>	Fed: Delisted Calif: FP	Nests on high cliffs, generally near water bodies. Will occasionally nest in tree cavities or on tall buildings or other structures. Has been reported nesting on transmission towers. May use abandoned nests of other raptors. Feeds on birds (especially shorebirds & waterfowl). Widespread, but rare worldwide.	Moderate. Minimal suitable nesting habitat, likely to fly over the project site, seen regularly in the vicinity of the project site, not known to nest in the vicinity.
Bald eagle <i>Haliaeetus leucocephalus</i>	Fed: BGEPA Calif: END	Breed in large trees, usually near major rivers or lakes; winters more widely; scattered distribution in N America; esp. coastal regions; formerly federally listed, delisted in 2007	Moderate. No suitable nesting habitat, likely to fly over the project site, seen regularly at Lake Gregory roughly 2.5 miles to the northwest.
California horned lark <i>Eremophila alpestris actia</i>	Fed: none Calif: SA, S3	Open, flat lands incl. sparse sagebrush or grassland, meadows, alkali flats; wide elev. range; breeds in western Calif (San Diego Co through Humboldt Co) and Baja Calif; winters in same range.	Low. Minimal suitable habitat, not observed.
California spotted owl <i>Strix occidentalis occidentalis</i>	Fed: none Calif: SC	Nests and forages year-around in dense conifer, oak, or (sometimes) riparian forest; Sierra Nevada, cent & S Coast Ranges, S Calif mtns.	Present. Observed on the project site in 2007 (TES).
Golden eagle <i>Aquila chrysaetos</i>	Fed: BGEPA Calif: FP	Generally open country of the Temperate Zone worldwide. Nesting primarily in rugged mountainous country. Golden eagles in the western U.S. are year-round residents.	Moderate. No suitable nesting habitat may fly over the project site, seen occasionally in the vicinity of the project site.
Least Bell's vireo <i>Vireo bellii pusillus</i>	Fed: END Calif: END	Summer resident of southern California in low riparian habitats in vicinity of water or dry river bottoms; found below 2000 ft.; nests placed along margins of bushes or on twigs projecting into pathways, usually willow, mesquite, baccharis.	Minimal. Known from numerous locations along the cismontane slope of the San Bernardino Mtns. Suitable habitat is present in upper Strawberry Creek watershed, but most of the watershed is at or above the limits of their elevation range. No suitable habitat on the project site and site is known above elevational range.

Table 3.3-3. Special-Status Wildlife Potentially Occurring on the Project Site

Species	Status	Habitat	Potential to Occur
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	Fed: END Calif: END	Breeds in dense riparian forests & shrublands, esp. in willows; scattered locations in Calif. and N Baja; near sea level to about 8000 ft. elev; winters in Cent. Amer.	Minimal. Known from several recent records in the region, including occurrences at San Timoteo Canyon, Cooper's Creek, Thurman Flats Picnic area, and Big Bear Lake. No recent records in the vicinity of the Twin Creek watershed. Suitable habitat is present in the upper Strawberry Creek watershed south of the project site. No suitable nesting habitat on the project site, not detected.
Yellow warbler <i>Setophaga petechia</i>	Fed: none Calif: SC	Riparian plant associations; prefers willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging	Moderate. Occurs along most creeks on cismontane slope of San Bernardino Mtns. Suitable habitat is present and species is likely to occur in the upper Strawberry Creek watershed south of the project site. Suitable habitat present on project site.
MAMMALS			
American badger <i>Taxidea taxus</i>	Fed: none Calif: SC	Mountains, deserts, interior valleys where burrowing animals are avail as prey and soil permits digging; throughout cent and W N Amer.	Moderate. Project site may provide suitable foraging habitat, record from less than 5 mi northeast of project site.
Fringed myotis <i>Myotis thysanodes</i>	Fed: none Calif: SA, S4	Four-corners states through Calif., Pacific NW, and mainl. Mexico; arid forests & woodl, gen. 4000-7000 ft. elev.; roost in caves, buildings, & rock crevices.	High (foraging). Suitable foraging habitat present. Minimal (roosting). No suitable roosting sites present.
Hoary bat <i>Lasiurus cinereus</i>	Fed: none Calif: SA, S4?	Common and widespread, found in a wide range of habitats, roosts in dense foliage of medium to large trees and forages in open areas or habitat edges.	High (foraging). Suitable foraging habitat present. Moderate (roosting). Suitable roosting sites present.
Lodgepole chipmunk <i>Neotamias speciosus speciosus</i>	Fed: none Calif: SA, S2S3	Pine forest, sometimes montane chaparral, above about 6400 ft. elev.; San Jacinto, San Bernardino, S Sierra, maybe San Gabr. Mtns.	Low. Suitable habitat present, below elevation range.
Long-eared myotis <i>Myotis volans</i>	Fed: none Calif: SA, S4?	W N America, SE Alaska to Mexico; arid woods; wide elev. range; roost in buildings, crevices, trees; forage over water and in forest openings.	High (foraging). Suitable foraging habitat present. Minimal (roosting). No suitable roosting sites present.
Long-legged myotis <i>Myotis evotis</i>	Fed: none Calif: SA, S4?	W North America, British Columbia to N Baja; montane & coastal conifer forests; roosts in trees, buildings and caves; forage in woods & over water.	High (foraging). Suitable foraging habitat present. Moderate (roosting). Suitable roosting sites present.
Pocketed free-tailed bat <i>Nyctinomops femorosaccus</i>	Fed: none Calif: SC	Arid areas of Calif. and the SW US; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian; roosts on high cliffs.	Low (foraging). Very few record in southern California. Minimal (roosting). No suitable roosting sites present.
Ringtail <i>Bassariscus astutus</i>	Fed: none Calif: FP	Most of Calif and the SW US, to tropical Mexico; forests, woodlands, deserts; nocturnal; dens in burrows, trees, or rock crevices.	Moderate. Suitable habitat present; not tracked in the CNDDDB, but known from the area.

Table 3.3-3. Special-Status Wildlife Potentially Occurring on the Project Site

Species	Status	Habitat	Potential to Occur
San Bernardino flying squirrel <i>Glaucomys sabrinus californicus</i>	Fed: none Calif: SC	Mesic forest w/ white fir & black oak, above about 5200 ft. elev.; San Bernardino and San Jacinto Mtns (expected in San Gabriel Mtns).	Present. Suitable habitat present, documented on the project site in 2001 (Envira, 2003).
Small-footed myotis <i>Myotis ciliolabrum</i>	Fed: none Calif: SA, S2S3	Much of W North America, wide elev. range; roost in caves, rock crevices, buildings, bridges; forage over water and in open woods; hibernate in winter.	High (foraging). Suitable foraging habitat present. Minimal (roosting). No suitable roosting sites present.
Townsend's big-eared bat (incl. all subspecies) <i>Corynorhinus townsendii</i>	Fed: none Calif: Scand., SC	Many habitats throughout Calif and W N Amer, scattered pop'ns in E; day roosts in caves, tunnels, mines; feed primarily on moths.	High (foraging). Suitable foraging habitat present. Minimal (roosting). No suitable roosting sites present.
Western mastiff bat <i>Eumops perotis californicus</i>	Fed: none Calif: SC	Lowlands (rare exceptions); cent. and S. Calif., S Ariz., NM, SW Tex., N. Mexico; roost in deep rock crevices, forage over wide areas.	High (foraging). Suitable foraging habitat present. Minimal (roosting). No suitable roosting sites present.
White-eared pocket mouse <i>Perognathus alticolus alticolus</i>	Fed: none Calif: SC	Patches of grass or ferns, historically from San Bernardino Mts, Running Springs and west, evidently now extinct.	Minimal. Suitable habitat present, believed extirpated or extinct.
Yuma myotis <i>Myotis yumanensis</i>	Fed: none Calif: SA, S4?	W North America, British Columbia to central Mexico; roost in buildings, bridges, caves, mines; feed over open water.	High (foraging). Suitable foraging habitat present. Low (roosting). Marginally suitable roosting sites present.

Source: CDFW, 2015a; eBird, 2015.
Key to status codes at bottom of Table 3.3-2.

Listed Threatened or Endangered Wildlife Species. Federal- or state-listed threatened or endangered wildlife species were not observed on the project site during any of the field surveys. Southern rubber boa (*Charina umbratica*) and bald eagle (*Haliaeetus leucocephalus*) are the only listed species with potential to occur on the project site. There is no designated critical habitat for any federally listed species on the project site.

The southern rubber boa is a state-listed threatened species. It generally occurs in mesic (relatively moist) montane forests above about 5,000 feet elevation. The southern rubber boa is secretive and takes cover under rotting logs and other surface debris. It is mainly crepuscular (active at dawn and dusk) or nocturnal. During the cooler months, the southern rubber boa is inactive and remains in underground hibernacula, often located in rock outcrops. In the San Bernardino Mountains, most observations have been in the western part of the range around Lake Arrowhead and Running Springs and in the Barton Flats area. There are also a few records in the Big Bear Lake area. The CNDDDB lists several occurrences of this species in the Harrison Mountain USGS topo quad (CDFW, 2015a). One of these occurrences was from Daley Canyon, within 0.5 miles of the Project site (CDFW, 2015a). The Biotic Resources Overlay maps in the San Bernardino County Development Code depict habitat for southern rubber boa throughout the project site (County of San Bernardino Land Use Services Department, 2007). There is suitable habitat for southern rubber boa in the project site, and it has a high potential to occur.

The bald eagle is a state-listed endangered species and is protected under the Bald and Golden Eagle Protection Act (BGEPA). It generally nests near large bodies of water or free flowing rivers with abundant fish for foraging and adjacent tall trees, snags, or rocks for perching. It primarily eats fish, but will also take birds, mammals, and carrion if available. Nests are usually located near a permanent water source and

placed in tall trees or on cliffs. Bald eagles roost communally in winter in dense, sheltered, remote conifer stands (Zeiner et al., 1990). Bald eagles have been documented regularly at Lake Gregory and Lake Arrowhead and have also been observed flying over the project site (eBird, 2015). There is suitable upland foraging habitat and roosting sites on the project site. Bald eagles winter at many of the lakes in southern California, including lakes throughout the San Bernardino Mountains. Bald eagles have successfully nested at Big Bear Lake in the San Bernardino Mountains in recent years (CNDDDB, 2015). They have attempted nesting in other more remote areas of the San Bernardino Mountains, including in Lake Silverwood watershed (Stephenson and Calcarone, 1999). It is unlikely that bald eagles would nest at or near the Project site due to proximity to human activities and distance to a large body of water. Bald eagles are likely to fly over the project site and have a moderate potential to use the project site for upland foraging and roosting.

Other Special-status Wildlife Species. Two special-status wildlife species were observed on the project site during previous focused biological surveys: California spotted owl (*Strix occidentalis occidentalis*) and San Bernardino flying squirrel (*Glaucomys sabrinus californicus*). No special-status wildlife species were observed on the project site during the most recent reconnaissance surveys. In addition to California spotted owl and San Bernardino flying squirrel, numerous other California Species of Special Concern, Fully Protected species, and Special Animals have at least a moderate potential for occurrence. In addition, several special-status bats could occur. There is suitable habitat for several additional special-status wildlife species on the site; however, their likelihood of occurrence is either low or minimal because of lack of suitable roosting or foraging habitats (see Table 3.3-3).

The California spotted owl (*Strix occidentalis occidentalis*) is a CDFW Species of Special Concern. It nests in dense, shaded mature forests throughout portions of the San Bernardino Mountains, in mature forest stands with multi-layered canopies usually consisting of hardwoods and conifers (Stephenson and Calcarone 1999). The nests are found in cavities or limbs of large trees. California spotted owl is a year-round resident (i.e., non-migratory) and feeds primarily on small mammals such as wood rats. The California spotted owl is not heat-tolerant and apparently requires shaded roost sites during summer. Foraging habitat is generally similar to breeding habitat, but may be more open (Davis and Gould, 2008). The project site is three miles east of the Spotted Owl Habitat Overlay (Open Space Overlay 18) in the San Bernardino County Development Code (San Bernardino County Land Use Services Department, 2007). During focused surveys for California spotted owl in 2007 an adult spotted owl was observed on three occasions on or immediately adjacent to the project site (TES, 2007). On one of the surveys the owl was followed off site and a nest was located roughly one half mile to the southeast of the project site (TES, 2007). The project site provides foraging habitat for California spotted owls. There is a moderate potential for nesting on the project site.

The San Bernardino flying squirrel (*Glaucomys sabrinus californicus*) is a CDFW Species of Special Concern. It is found in conifer and hardwood forests from about 3,900 to 8,200 feet elevation, usually in mature forest stands dominated by black oak and white fir. It nests in tree cavities and also builds stick nests in trees. It eats acorns and other tree seeds, wild fruits, insects, fungi, and tree sap. It typically mates in early March with young being born between May and July (Wells-Gosling and Heany, 1984). The young typically leave the nest in two months (Wells-Gosling and Heany, 1984). The San Bernardino flying squirrel is nocturnal and secretive, and therefore rarely seen. It occurs in low-density residential areas and organization camps, but may be absent from more densely developed areas (Stephenson and Calcarone, 1999). The Biotic Resources Overlay maps depict habitat for San Bernardino flying squirrel throughout the surrounding area (San Bernardino County Land Use Services Department, 2007). San Bernardino flying squirrels were captured twice on or immediately adjacent to the project site during small mammal

trapping in 2001 (Envira, 2003). The project site provides suitable flying squirrel foraging and nesting habitat and is occupied at least for foraging.

Several special-status bat species (Townsend's big-eared bat, hoary bat, long-eared myotis, fringed myotis, small-footed myotis, long-legged myotis, Yuma myotis, and western mastiff bat) have been documented within the San Bernardino National Forest (Miner and Stokes, 2005) and could use the site for foraging or roosting. Most special-status bats roost primarily in caves, abandoned mine shafts, or old buildings. Others may roost in rock crevices or tree cavities, bark crevices, or foliage. Townsend's big-eared bat is a California species of special concern and a candidate for state listing as threatened. The red bat and western mastiff bat are California species of special concern, while the other species are ranked as "special animals." Occurrence potential for all special-status bats is addressed in Table 3.3-3.

Other California Species of Special Concern with a moderate or high potential to occur on the project site are San Bernardino Mountain kingsnake (*Lampropeltis zonata parvirubra*), silvery legless lizard (*Anniella pulchra pulchra*), two-striped garter snake (*Thamnophis hammondi*), yellow warbler (*Dendroica petechia brewsteri*), and American badger (*Taxidea taxus*). Two Fully Protected species, the ringtail (*Bassariscus astutus*), the American peregrine falcon (*Falco peregrinus anatum*), and two Special Animals, Andrew's marble butterfly (*Euchloe hyantis andrewsi*) and San Bernardino ringneck snake (*Diadophis punctatus modestus*), also have moderate to high potential for occurrence; see Table 3.3-3.

Wildlife Movement

The ability for wildlife to move freely among populations is important to long-term genetic variation and demography. Fragmentation and isolation of natural habitat may cause loss of native species diversity in fragmented habitats. In the short term, wildlife movement may also be important to individual animals' ability to occupy their home ranges, if their ranges extend across a potential movement barrier. These considerations are especially important for rare, threatened, or endangered species, and wide-ranging species such as large mammals, which exist in low population densities.

The California Essential Habitat Connectivity Project was commissioned by the California Department of Transportation (Caltrans) and CDFW to create a statewide assessment of essential habitat connectivity for conservation and infrastructure planning (Caltrans and CDFW, 2010). One of its goals was to create the Essential Connectivity Map, which depicts large, relatively natural habitat blocks that support native biodiversity (natural landscape blocks) and areas essential for ecological connectivity between them (essential connectivity areas). This map does not reflect the needs of particular species, but is based on overall biological connectivity and ecological integrity. A more detailed analysis is required to assess local and regional needs for connectivity and develop linkage designs based on the requirements of individual species (Caltrans and CDFW, 2010).

The Essential Connectivity Map (Caltrans and CDFW, 2010) identifies several natural landscape blocks within the San Bernardino Mountains with essential connectivity areas in some of the more developed areas. The project site is entirely within an essential connectivity area which connects a natural landscape block just to the south of State Highway 18 with natural landscape blocked to the northeast and northwest of the project site.

The western portion of the project site lies within the Strawberry Creek Wildlife Corridor. This wildlife corridor is identified in the San Bernardino County Open Space Overlays (San Bernardino County Land Use Services Department, 2007). The Strawberry Creek Wildlife Corridor was established to connect the Strawberry Creek drainage to the south with habitat further to the north (Corridor 16). The County Plan states that Open space should be maintained in this area to preserve habitat values.

Jurisdictional Waters and Wetlands

A delineation of jurisdictional waters and wetlands was conducted by Aspen biologists on April 2, 2015, and concludes that jurisdictional waters and wetlands are present. There is a spring near the southern end of the attenuation basin(s) where perennial water begins flowing north through the project site. The water eventually leaves the site and continues north in Little Bear Creek down Daley Canyon, through the community of Blue Jay and eventually into Lake Arrowhead. Storm flows originate on State Highway 18 and flow into the project site, through an incised sandy wash, past the spring, and then follow the route of the perennial flows. Lake Arrowhead is jurisdictional therefore all connected channels will be federally jurisdictional. The jurisdictional delineation report is attached to this report.

Water Diversion

Strawberry Creek. The headwaters of Strawberry Creek drain from the southern vicinity of the community of Rimforest into Twin Creek approximately 4.5 miles downstream; Twin Creek enters a flood control facility 1.8 miles further downstream. Approximately 7 miles further downstream, Twin Creek confluences with the Santa Ana River south of San Bernardino. The project would restore 47 acre-feet per year (afy) of flows that would otherwise enter Strawberry Creek (Santa Ana River watershed) into Little Bear Creek (Mojave River watershed), with flows occurring in direct response to precipitation events and snowmelt runoff (Bonadiman, 2010).

The Strawberry Creek watershed (2,817 acres) is part of the larger East Twin Creek watershed (5,631 acres) and the Santa Ana River watershed (98,048 acres). The Rimforest drainage area to be restored under the proposed project is 77 acres in size, or approximately 2.7 percent of the size of the Strawberry Creek watershed, and 1.4 percent of the size of the East Twin Creek watershed (Bonadiman, 2010).

Existing flow through the East Twin Creek watershed is 1,921 afy. The existing flow through the Rimforest drainage area (47 afy) to be restored under the proposed project represents approximately 2.4 percent of total flows through East Twin Creek watershed (which includes Strawberry Creek) (Bonadiman, 2010).

Flow data was recorded at seven downstream locations within the East Twin Creek Watershed (including the Strawberry Creek Watershed). Using this flow data flow modeling was done to determine what impacts the proposed project would have on downstream flow volumes. Based on this assessment the proposed project would result in the following decreases of flow volume (see Table 3.3-4).

3.3-4 Table. Downstream Flow Volumes and Proposed Changes.

Transect Number	Distance downstream (miles)	Watershed area above transect (square miles)	Winter low-flow water volume (cfs)	Decrease in volume resulting from project (%).	Decrease in depth resulting from project (%).
1	0.75	0.31	0.33	24	38
2	1.70	0.95	1.93	7	13
3	2.35	1.83	0.96	4	6
4	4.0	4.30	2.85	2	4
5	4.6	8.19	3.13	1	2
6	5.25	9.06	7.75	1	2
7	6.00	9.35	4.23	1	0

The project is designed to substantially reduce existing rates of erosion and susceptibility to landslide hazards in southern Rimforest; in doing so, the project would also reduce siltation/sedimentation in the Strawberry Creek drainage associated with sediment-laden surface runoff from the landslide area. The

upstream-most one mile of the upper Strawberry Creek drainage has heavy sedimentation and very little riparian vegetation. During the habitat assessment, heavy sedimentation, more than 10 feet thick, was observed in this portion of the watershed. Young riparian vegetation had recently been pushed down and covered by the sediment. This upstream portion of the watershed has some potential to support riparian vegetation, but periodic sediment deposition appears to prevent long-term establishment. Downstream of this area, the sediment load decreases and the amount of vegetation increases. The recent sediment deposition continued downstream to just below the confluence of Strawberry and Twin Creeks where sand had recently been deposited, covering much of the pool habitat and potentially deteriorating some of the aquatic habitat.

Starting at approximately 1.25 miles downstream of the community of Rimforest, Strawberry Creek turns in a southwesterly direction and descends steeply through a narrow canyon. This canyon has several waterfalls with drops greater than five feet, which would prevent aquatic species from moving upstream through this canyon. In addition, the canyon has a very heavy sediment load and riparian vegetation is nearly absent. At approximately 1.75 miles downstream, the creek joins an unnamed tributary that enters from the west. At this point, riparian vegetation, dominated by white alders (*Alnus rhombifolia*), becomes intermittent and the first obligate wetland plant species, such as wrinkled rush (*Juncus rugulosus*), become established. This indicates that this reach of the creek likely has water present most of the year. The expected change in flow volume at this location due to project implementation would be a decrease of approximately seven percent and depth may decrease by 13 percent (see Table 3.3-4). Because this section does not appear to provide perennial aquatic habitat and the riparian vegetation is relatively sparse, these changes would have a less-than-significant impact on biological resources.

Further downstream at approximately 2.35 miles, the creek turns to the southwest again and descends steeply down the canyon. At this location, the first aquatic species, California tree frog (*Pseudacris cadaverina*), was observed, indicating that perennial water is likely to be present. Riparian vegetation was still sparse within this reach and was dominated with white alder and scattered willows (*Salix* spp.). Access below this point was very difficult, but the creek appears to run southwest for one mile before it confluences with an additional unnamed eastern tributary. At this point, the riparian vegetation becomes denser and may support suitable nesting habitat for southwestern willow flycatcher (*Empidonax traillii extimus*). The expected change in flow volume at this location would be a decrease of approximately four percent and depth may decrease by six percent (see Table 3.3-4). A reduction of four percent of the water volume is not expected to have a significant effect on biological resources because the changes in flow volume and water depth would be negligible.

Still further downstream, approximately four miles from the community of Rimforest, the canyon widens and the creek begins to form pool habitat. The riparian vegetation is dense and composed of western sycamore (*Platanus racemosa*), various willow species, white alder, and an understory of mulefat (*Baccharis salicifolia*) and desert wild grape (*Vitis girdiana*). This lower portion of the canyon, at an elevation of approximately 2,000 feet, is likely to provide suitable habitat to numerous special-status species such as least Bell's vireo (*Vireo bellii pusillus*), yellow warbler (*Setophaga petechia*), and two-striped garter snake. The best habitat for Santa Ana speckled dace (*Rhinichthys osculus* spp. 3) is also present in this lower portion of the canyon however this species is now considered extirpated from the watershed. This is also the location where Strawberry Creek confluences with Twin Creek, which flows from the north out of Coldwater Canyon. Twin Creek within Coldwater Canyon appears to provide the best riparian and aquatic habitat in the watershed because it is largely protected from the sediment deposition which has degraded the habitat in Strawberry Creek. This suitable riparian and aquatic habitat continues downstream for approximately two miles before entering a flood control facility. The expected change in flow volume at this location would be a decrease of less than two percent and depth may

decrease by up to four percent (see Table 3.3-4). A change in depth of four percent would alter the average low-flow depth of the creek from 13 cm (5.12 inches) to approximately 12.5 cm (4.92 inches). A reduction of two percent of the water volume is not expected to significantly affect biological resources because the change would be negligible.

Little Bear Creek. Little Bear Creek is an intermittent creek that follows Daley Canyon from the proposed project site to Lake Arrowhead. Immediately downstream of proposed project site, Little Bear Creek flows approximately 0.15 miles to the north as a natural unlined creek until it reaches a San Bernardino County Department of Public Works maintenance yard. At this point, flows enter an underground culvert that runs below the community of Aqua Fria for approximately 0.35 miles before it resurfaces. The creek then flows to the northeast for approximately 0.5 miles, crossing through approximately 25 private residential lots, before once again going underground into a culvert and through the community of Blue Jay for another 0.2 miles. The creek resurfaces briefly again before running under SR-189 and a commercial building. The final stretch of the creek runs to the northeast for approximately 0.3 miles before emptying into Lake Arrowhead. The total distance between the proposed project site and Lake Arrowhead is approximately 1.5 miles, of which all but approximately 0.15 miles are inaccessible due to the creek being below ground or on private land.

Vegetation along the upper portion of Little Bear Creek, from the proposed project site to the maintenance yard, is dominated by American dogwood and matches the description of Red Osier Thickets as described in see Section 3.3.1 (Environmental Setting) above. Further downstream, the vegetation transitions to a mature white alder forest with an overstory canopy and very little understory vegetation. There is extensive development throughout the lower 1.35 miles of the creek, and it provides no suitable habitat for special-status wildlife species.

3.3.2 Applicable Regulations, Plans, and Standards

The following are federal, state, and local laws, ordinances, regulations, and standards that apply to biological resources and jurisdictional waters and wetlands.

Federal Regulations

Endangered Species Act. The Endangered Species Act (ESA) (16 USC 1531 et seq.) establishes legal requirements for the conservation of endangered and threatened species and the ecosystems upon which they depend.

Section 9. Section 9 of the ESA lists those actions that are prohibited under the ESA, including take (i.e., to harass, harm, pursue, hunt, wound, or kill) of listed species without special exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or shelter. "Harass" is further defined as actions that create the likelihood of injury to listed species to an extent as to significantly disrupt normal behavior patterns which include breeding, feeding, and shelter.

Section 10. Section 10 allows for the "incidental take" of endangered and threatened species by non-Federal entities. Incidental take is defined by the ESA as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Section 10 requires an applicant for an incidental take permit to submit a habitat conservation plan that specifies, among other things, the impacts that are likely to result from the taking and the measures the applicant will undertake to minimize and mitigate such impacts.

Critical Habitat. Designation of an area as critical habitat provides a means by which the habitat of an endangered or threatened species can be protected from adverse changes or destruction resulting from federal activities or projects. A critical habitat designation does not set up a preserve or refuge and usually applies only when federal funding, permits, or projects are involved.

Clean Water Act. The Clean Water Act (33 USC 1251 et seq.) establishes legal requirements for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.

Section 401/WDRs. Section 401 requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the United States must obtain a State certification that the discharge complies with other provisions of the Clean Water Act. The Regional Water Quality Control Boards (RWQCBs) administer the certification program in California. If the surface waters that are being impacted are not waters of the United States (i.e., a non-federal water), or are waters of the United States that do not require a federal permit or license, a "Report of Waste Discharge" is required, and Waste Discharge Requirements (WDRs) must be obtained from the Regional Water Board pursuant to the Porter-Cologne Water Quality Control Act prior to starting the activities. If a project would require water quality certification or dredge-and-fill WDRs that affect two water quality control regions, the State Water Board's Division of Water Quality would be responsible for those permitting duties.

Section 402. Section 402, subdivision (p) stormwater permit, in the form of a National Pollutant Discharge Elimination System (NPDES) Construction General Stormwater Permit, may be required for land disturbance associated with the proposed project. This permit requires the development of a Stormwater Pollution Prevention Plan and implementation of best management practices (BMPs) for erosion control and prevention.

Section 404. Section 404 establishes a permit program administered by the U.S. Army Corps of Engineers (USACE) regulating the discharge of dredged or fill material into waters of the United States, including wetlands. Implementing regulations by the USACE are found at 33 CFR Parts 320-330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines and were developed by the EPA in conjunction with the USACE (40 CFR Parts 230). The Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act (MBTA) (16 USC 703-711) is a treaty signed by the United States, Canada, Mexico, and Japan that prohibits take of any migratory bird, including eggs or active nests, except as permitted by regulation (e.g., hunting waterfowl or upland game species). Under the MBTA, "migratory bird" is broadly defined as "any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle" and thus applies to most native bird species.

Bald and Golden Eagle Protection Act. The BGEPA (16 USC, 668, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this act. Under BGEPA, take includes "disturb," which means "to agitate or bother a bald eagle or a golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

State Laws and Regulations

California Endangered Species Act. The California Endangered Species Act (CESA) (Fish and Game Code 2050 et seq.) establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. For projects that affect a species listed under both CESA and the federal ESA, compliance with the federal ESA will satisfy CESA if CDFW determines that the federal incidental take authorization is consistent with CESA under Fish and Game Code Section 2080.1. For projects that will result in take of a species listed under CESA but not under the federal ESA, the applicant must apply for a take permit under Section 2081(b).

Fully Protected Designations – California Fish and Game Code Sections 3511, 4700, 5515, and 5050. Prior to enactment of CESA and the federal ESA, California enacted laws to “fully protect” designated wildlife species from take, including hunting, harvesting, and other activities. Unlike the subsequent CESA and ESA, there was no provision for authorized take of designated fully protected species. Currently, 36 fish and wildlife species are designated as fully protected in California, including golden eagle.

California Senate Bill 618 (signed by Governor Brown in October 2011) authorizes take of fully protected species, where pursuant to a Natural Conservation Community Plan, approved by CDFW. The legislation gives fully protected species the same level of protection as is provided under the Natural Community Conservation Planning Act for endangered and threatened species (see below).

Native Birds – California Fish and Game Code Sections 3503 and 3513. California Fish and Game Code Section 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; Section 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and Section 3513 provides for the adoption of the MBTA’s provisions (above). With the exception of a few non-native birds such as European starling, the take of any birds or loss of active bird nests or young is regulated by these statutes. Most of these species have no other special conservation status as defined above. The administering agency for these sections is the CDFW. As with the MBTA, these statutes offer no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game migratory birds.

Streambed Alteration Agreements – California Fish and Game Code Sections 1600-1616. Under these sections of the Fish and Game Code, an applicant is required to notify CDFW prior to constructing a project that would divert, obstruct, or change the natural flow, bed, channel, or bank of a river, stream, or lake. Preliminary notification and project review generally occur during the environmental review process. When a fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project. CDFW jurisdiction is determined to occur within the water body of any natural river, stream, or lake. The term “stream,” which includes creeks and rivers, is defined in Title 14, CCR, Section 1.72.

Regional and Local Regulations

County of San Bernardino Development Code

The San Bernardino County Development Code implements the goals and policies of the General Plan by regulating land uses within the unincorporated areas of the County. Overlay maps depict areas subject to various county policies. The Biotic Resources Overlay implements General Plan policies regarding the

protection and conservation of beneficial rare and endangered plants and animal resources and their habitats.

The Biotic Resources Overlay maps depict habitat for southern rubber boa and San Bernardino flying squirrel throughout the local area. The project site is roughly 3 miles east of the California Spotted Owl Habitat Overlay (Open Space Overlay 18). The policy states that habitat areas for southern rubber road and San Bernardino spotted owl should be maintained.

The west end of the project site lies within the Strawberry Creek Wildlife Corridor. This wildlife corridor follows the alignment of Strawberry Creek from approximately the City and San Bernardino northward to the national forest and ultimately connects across the national forest to Corridor 16. This area contains important riparian habitat. Open space should be maintained in this area to preserve habitat values.

For projects within the Biotic Resources and Open Space Overlay areas, Chapter 82.11 and 82.19 of the Development Code require that for proposed new land uses, or increases of existing land use by more than 25 percent of disturbed area, the land use application shall include a biological resources report, along with mitigation measures to reduce or eliminate impacts to the identified resources. The Development Code also states that the County's Conditions of Approval for the project shall incorporate the mitigation measures from the biological report.

Chapter 88.01 of the Development Code regulates vegetation removal, including permitting, mitigation, and treatment of felled trees. A Tree or Plant Removal Permit is required for the removal of regulated trees and plants. In the project vicinity, regulated trees and plants are living, native trees with a stem diameter of six inches or greater or stem circumference of 19 inches or greater, measured at 4.5 feet above natural grade level; riparian vegetation within 200 feet of the bank of a stream. Conditions of Approval may include replacement, restoration, or in-lieu mitigation for impacts.

Section 88.01.090 details regulations for treatment and disposal of felled trees to protect against damaging insects (e.g., bark beetles) and diseases. This section applies to coniferous trees and lists several methods for treating felled trees, and at least one of these methods must be employed within 15 days after a tree is cut. There are several other requirements in the section, including the treatment of cut stumps with borax powder within two hours of cutting to protect against annosus root rot (*Fomes annosus*).

Environmental Commitments

Several Environmental Commitments (ECs) have been developed by the County of San Bernardino (County) and are incorporated into the proposed project description to minimize potential effects to various resource areas. While no ECs are written specifically for biological resources, ECs for Hydrology and water resources such as preparing a Stormwater Pollution Prevention Plan (SWPPP) prevent water quality degradation. All the ECs are described in Section 2.5 (Environmental Commitments).

3.3.3 Environmental Impacts and Mitigation Measures

This section evaluates the project's potential direct and indirect effects to biological resources and describes feasible mitigation measures to reduce these impacts to less-than-significant levels. The impact analysis is based on the biological resources described above and in the proposed project description in Section 2.

A significant impact is defined under CEQA as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project" (CEQA Guidelines Section 15382).

The CEQA Guidelines define direct impacts as those impacts that result from the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance and are still reasonably foreseeable and related to the operation of the project.

3.3.3.1 Significance Criteria

The significance criteria listed below are from the Environmental Checklist form in Appendix G of the CEQA guidelines, with the exception of Criterion BR3, which has been modified slightly to include waters of the State. They are used to determine whether the proposed project would result in significant impacts to biological resources. Impacts would be significant if the project would:

- *Criterion BR1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;*
- *Criterion BR2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS;*
- *Criterion BR3: Have a substantial adverse effect on federally protected wetlands, federally protected waters, non-federally protected state waters (SWRCB or RWQCB), and state waters regulated by CDFW through direct removal, filling, hydrological interruption, or other means;*
- *Criterion BR4: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or*
- *Criterion BR5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

The following threshold from the CEQA Appendix G Environmental Checklist was found to have no impact in the Initial Study and is not discussed further beyond the summary below:

- *C.3.4 (f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

The project site is not located within any adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP area. The project would not conflict with such plan and no impact would occur related to this threshold.

3.3.3.2 Project Impacts

Criterion BR1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS.

Impact BIO-1: Construction activities would result in adverse effects to species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS (Class II).

Special-Status Plants

There are no listed threatened or endangered plants or plants that are proposed or candidates for State or federal listing on the project site. In addition, there is no suitable habitat for listed, proposed, or

candidate plants on the project site or adjacent areas. The project would not affect listed, proposed, or candidate plant species.

Two special-status plants with a CRPR of 4 were observed on the project site. These included Common woolly sunflower and Laguna Mountains jewelflower. The common woolly sunflower was reported as being present in previous reports but was not observed during the most recent surveys. It is likely still present in low numbers within the project site. Laguna Mountains jewelflower was observed at a few locations along Daley Canyon within and immediately adjacent to the project site.

Three additional plant species with a CRPR 1B have the potential to be present on the project site, including San Bernardino Mountains owl's-clover, southern jewelflower, and silver-haired ivesia. In addition, Parish's yampah, a CRPR 2 species and Mojave a CRPR 4 species are known from the immediate vicinity and have potential to be present on the project site. If other special-status plants are present within the project site they could be directly affected by the temporary or permanent removal of vegetation or by trampling or crushing during construction, as well as indirect impacts from dust, hazardous materials, or invasive species.

These impacts, should they occur, would not be substantial for Common woolly sunflower and Laguna Mountains jewelflower or special-status plants ranking CRPR 4 due to the low numbers of plants occurring (or potentially occurring) on the attenuation basin(s) and their conservation status as rare or watch-list species, but not listed under the CESA or ESA.

Mitigation Measure (MM) BIO-1b (Pre-construction Surveys and Construction Monitoring) would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status plants would be avoided to the maximum extent possible. MM BIO-1c (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-1d (Prevent Invasive Weed Introduction), and BIO-1f (Fugitive Dust Control) would further reduce any potential impacts to special-status plants by identifying and avoiding any occurrences in the project site to the extent feasible, restoring or compensating for impacts to habitat, controlling fugitive dust, and minimizing the potential for weed introductions or spread. MM BIO-1f (Personnel Training) would require the County to present an environmental-education program to project workers on sensitive biological resources. With implementation of BIO-1f, all personnel on the project site will be familiar with the sensitive resources on the site and associated minimization measures. Adopted mitigation measures from the Final EIR, environmental laws and regulations, permits, and all other agency requirements will help to reduce impacts to below a level of significance by allowing personnel to be able to identify and avoid sensitive resources in the field and understand all appropriate measures and regulations. Implementation of these mitigation measures would reduce impacts to special-status plants to less-than-significant (Class II).

Special-Status Wildlife

The project site may provide foraging, roosting, sheltering, or nesting habitat for Andrew's marble butterfly, San Bernardino Mountain kingsnake, San Bernardino ringneck snake, silvery legless lizard, southern rubber boa, two-striped garter snake, bald eagle (wintering/foraging), California spotted owl, yellow warbler, American peregrine falcon, American badger, ringtail, and San Bernardino flying squirrel. Construction activities at the project site could affect these species and their habitat.

Special-status wildlife may be affected by temporary or permanent loss or modification of habitat, disturbance from fugitive dust, noise, and vibration, entrapment in construction materials or excavations, exposure to hazardous substances accidentally released by vehicles or other equipment, and

displacement, injury, or morality from Project-related construction activities. Absent mitigation, these impacts would be significant.

Restoring flows from Strawberry Creek could have downstream impacts to riparian and aquatic special-status wildlife. Santa Ana speckled dace is a state species of special concern and was the only fully aquatic special-status species known from the upper Strawberry Creek watershed. A large fire in 2003 burned much of the watershed and a subsequent flood in 2005 caused catastrophic flows which are the likely cause of the recent extirpation of this species from the watershed. Several listed aquatic species have a minimal potential to occur in Strawberry and Twin Creeks: Santa Ana sucker, California red-legged frog, and mountain yellow-legged frog. Arroyo chub and two-striped garter snake are both special-status species that also have potential to occur. Two listed birds that nest in riparian vegetation have potential to occur downstream including the Least Bell's vireo and southwestern willow flycatcher as well as yellow warbler which is another species of special concern. The likelihood of these species occurring in the upper Strawberry Creek watershed is described in Table 3.3-3.

Most of these special-status species are aquatic and restricted to areas of running creek which are present more than two miles downstream of the project area and would not be affected by the restoration of such a negligible amount of water from the total watershed. Some of the bird species, such as the listed southwestern willow flycatcher and least Bell's vireo could occupy the riparian habitat along Strawberry Creek but they would not be impacted by the restoration of the flowpath because any impacts to nesting habitat would occur over time and be less than significant.

Southern Rubber Boa. The southern rubber boa is a state-listed threatened species protected under CESA. The project site is shown as southern rubber boa habitat in the San Bernardino Development Code Biological Resource Overlay, and a field survey confirmed that the site includes habitat suitable for the southern rubber boa. The entire project site, with the exception of the storm drain alignment along Hwy. 18 and Pine Ave., provides suitable habitat for the rubber boa. If southern rubber boa is present within the project site, it may be affected by temporary or permanent loss or modification of habitat, disturbance from fugitive dust, noise, and vibration, entrapment in construction materials or excavations, exposure to hazardous substances accidentally released by vehicles or other equipment, and injury or morality from project-related construction activities, particularly during removal of vegetation and initial grading. Absent mitigation, these impacts would be significant.

Prior to initiation of project-related activities within suitable habitat for southern rubber boa, the County would be required to consult with CDFW to obtain applicable take authorization or to identify additional avoidance or mitigation measures that may be necessary to avoid take. The County would be required to implement all terms or conditions of such authorization and to comply with any additional avoidance or mitigation measures that are identified.

MM BIO-1h (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. With implementation of this measure southern rubber boa would not be at risk of injury or mortality due to entrapment or other project activities and would therefore reduce the impacts to below a level of significance.

MM BIO-1j (Manage Project Trash) would require the County to contain project-related trash and remove it from the work area daily. MM BIO-1c (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss) and BIO-1e (Speed Limit) would further minimize impacts by requiring the County to minimize loss of habitat and compensate for habitat that is lost and reduce speed limit to 10 mph to avoid injury or mortality to southern rubber boa cause by vehicles. MM BIO-1f (Personnel Training) would

require the County to present an environmental-education program to project workers on sensitive biological resources which would allow them to recognize these species on the project site and know to avoid them.

MM BIO-1k (Minimization and Avoidance Measures for Southern Rubber Boa) requires the County to coordinate with CDFW to obtain an Incidental Take Permit (ITP) prior to the start of project activities. It would also require the County to conduct clearance surveys for southern rubber boa immediately prior to initial ground disturbance, install exclusion fencing around work areas, and monitor initial vegetation removal and site preparation. This mitigation measure also requires that any southern rubber boa found on the project site will be relocated off the site by a qualified biologist and in accordance with take authorization from CDFW as applicable. With implementation of these measures, impacts of construction and operation of the proposed project would be less than significant (Class II).

Bald Eagle. The bald eagle is a state-listed endangered species protected under CESA and BGEPA. Bald eagles have been seen flying over and may forage on the project site, but has a low potential to nest there. The bald eagle may be affected by temporary or permanent loss or modification of habitat or disturbance from fugitive dust, noise, and vibrations. These impacts, should they occur would be adverse but less than significant because of the bald eagles ability to leave the area and utilize other similar habitat that is abundant throughout the vicinity of the project site (Class III).

Andrew's Marble Butterfly. The Andrew's marble butterfly is a CDFW Special Animal. Larval food plants for this species may be present on the project site and it has a high potential for occurrence. This species may be affected by temporary or permanent loss or modification of habitat, including loss of larval food plants, disturbance from fugitive dust, noise, and vibration, entrapment in construction materials or excavations, exposure to hazardous substances accidentally released by vehicles or other equipment, and injury or mortality from project-related construction activities. Absent mitigation, these impacts would be significant.

MM BIO-1c (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-1d (Prevent Invasive Weed Introduction), BIO-1e (Speed Limit), and BIO-1f (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, reduce project speed limits to 10 mph, and control fugitive dust. Additionally, MM BIO-1f (Personnel Training) would require the County to present an environmental-education program to project workers on sensitive biological resources. With implementation of these MMs, potential adverse effects would be avoided or minimized and impacts to Andrew's marble butterfly would be reduced to a less-than-significant level (Class II).

Special-Status Reptiles. Several non-listed, special-status reptiles potentially occur on the project site. These include the San Bernardino Mountain kingsnake, San Bernardino ringneck snake, silvery legless lizard, and two-striped garter snake. Suitable habitat for these species is present in the project site and they each have a moderate to high potential for occurrence. Special-status reptiles may be affected by temporary or permanent loss or modification of habitat, disturbance from fugitive dust, noise, and vibration, entrapment in construction materials or excavations, exposure to hazardous substances accidentally released by vehicles or other equipment, and injury or mortality from project-related construction activities. Absent mitigation, these impacts would be significant.

MM BIO-1h (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. MM BIO-1j (Manage Project Trash) would require the County to contain project-related trash and remove it from the work area daily. MM BIO-1c (Minimize Impacts to Sensitive Habitat and Compensate

for Habitat Loss), BIO-1d (Prevent Invasive Weed Introduction), BIO-1e (Speed Limit), and BIO-1l (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, reduce project speed limits to 10 mph, and control fugitive dust. Additionally, MM BIO-1f (Personnel Training) would require the County to present an environmental-education program to project workers on sensitive biological resources. With implementation of these MMs, these potential adverse effects would be avoided or minimized and impacts to special-status reptiles would be reduced to a less-than-significant level (Class II).

California Spotted Owl. The California spotted owl is a state Species of Special Concern. The project site is roughly 3 miles east of the California Spotted Owl Habitat Overlay (Open Space Overlay 18). The project site is unlikely to support nesting spotted owls due to proximity to human activities, but the project site does provide suitable foraging habitat. California spotted owl may be affected by temporary or permanent loss or modification of habitat, disturbance from fugitive dust, noise, and vibration, exposure to hazardous substances accidentally released by vehicles or other equipment, loss of or damage to nests and injury or mortality to eggs and chicks during vegetation clearing, and injury or mortality from project-related construction activities. Absent mitigation, these impacts would be significant.

MM BIO-1g (Nest and Den Avoidance) would require the County to identify nests through pre-construction surveys and avoid take of active bird nests through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting birds prior to vegetation and habitat removal. MM BIO-1i (Avoid Nocturnal Wildlife) would require the County to carry out project-related construction activities during daylight hours to minimize impacts to nocturnal wildlife, including spotted owls. MM BIO-1j (Manage Project Trash) would require the County to contain project-related trash and remove it from the work area daily. MM BIO-1c (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-1d (Prevent Invasive Weed Introduction), MM BIO-1e (Speed Limit), and BIO-1l (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, reduce project speed limits to 10 mph, and control fugitive dust. Additionally, MM BIO-1f (Personnel Training) would require the County to present an environmental-education program to project workers on sensitive biological resources. With implementation of these MMs, potential adverse effects would be avoided or minimized and would reduce impacts to California spotted owl to a less-than-significant level (Class II).

Yellow Warbler. The yellow warbler is a state Species of Special Concern. Suitable habitat for this species is present on the project site and it has a moderate potential for occurrence. This species may be affected by temporary or permanent loss or modification of habitat; disturbance from fugitive dust, noise, and vibration; exposure to hazardous substances accidentally released by vehicles or other equipment; and injury or mortality from project-related construction activities. Absent mitigation, these impacts would be significant.

MM BIO-1g (Nest and Den Avoidance) would require the County to identify nests through pre-construction surveys and avoid take of active bird nests, either through scheduling of project activities outside the nesting season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting birds prior to vegetation and habitat removal. With implementation of this MM, potential adverse effects would be avoided or minimized and would reduce impacts to yellow warbler to a less-than-significant level (Class II).

American Peregrine Falcon. The American peregrine falcon is a state Fully Protected species. While there is minimal suitable nesting habitat on the project site, it has been seen regularly in the project vicinity and it has a moderate potential for occurrence. This species may be affected by temporary or permanent loss

or modification of habitat or disturbance from fugitive dust, noise, and vibration. These impacts, should they occur would be adverse but less than significant and would require no additional mitigation because this species has the ability to leave the area and there is extensive similar habitat throughout the vicinity of the project site that they could utilize (Class III).

American Badger. The American badger is a state Species of Special Concern. Suitable foraging habitat for this species is present in the project site and it has a moderate potential for occurrence. This species may be affected by temporary or permanent loss or modification of habitat or disturbance from fugitive dust, noise, and vibration. Absent mitigation, these impacts would be significant.

MM BIO-1g (Nest and Den Avoidance) would require the County to identify wildlife nests and dens through pre-construction surveys and avoid take of active nests and dens, either through scheduling of project activities outside the nesting/denning season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting or denning wildlife prior to vegetation and habitat removal. MM BIO-1h (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. MM BIO-1i (Avoid Nocturnal Wildlife) would require the County to carry out project-related construction activities during daylight hours to minimize impacts to nocturnal wildlife. Additionally, MM BIO-1f (Personnel Training) would require the County to present an environmental-education program to project workers on sensitive biological resources. With implementation of these MMs, potential adverse effects would be avoided or minimized and impacts to American badger would be reduced to a less-than-significant level (Class II).

Ringtail. The ringtail is a state Fully Protected species. Suitable habitat for this species is present in the project site and it has a moderate potential for occurrence. This species may be affected by temporary or permanent loss or modification of habitat or disturbance from fugitive dust, noise, and vibration; entrapment in construction materials or excavations; exposure to hazardous substances accidentally released by vehicles or other equipment; and injury or morality from project-related construction activities. Absent mitigation, these impacts would be significant.

MM BIO-1g (Nest and Den Avoidance) would require the County to identify wildlife nests and dens through pre-construction surveys and avoid take of active nests and dens, either through scheduling of project activities outside the nesting/denning season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting or denning wildlife prior to vegetation and habitat removal. MM BIO-1h (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. MM BIO-1i (Avoid Nocturnal Wildlife) would require the County to carry out project-related construction activities during daylight hours to minimize impacts to nocturnal wildlife. Additionally, MM BIO-1f (Personnel Training) would require the County to present an environmental-education program to project workers on sensitive biological resources. With implementation of these MMs, many of these potential adverse effects would be avoided or minimized and impacts to ringtail would be reduced to a less-than-significant level (Class II).

San Bernardino Flying Squirrel. The San Bernardino flying squirrel is a state Species of Special Concern. The Biotic Resources Overlay maps depict habitat for San Bernardino flying squirrel throughout the surrounding area (San Bernardino County Land Use Services Department, 2007). San Bernardino flying squirrels were captured twice on or immediately adjacent to the Project site during small mammal trapping in 2001 (Envira, 2003). The project site provides suitable foraging and nesting habitat and should be considered occupied. San Bernardino flying squirrel may be affected by temporary or permanent loss or modification of habitat; disturbance from fugitive dust, noise, and vibration; entrapment in

construction materials or excavations; exposure to hazardous substances accidentally released by vehicles or other equipment; and injury or morality from project-related construction activities. Absent mitigation, these impacts would be significant.

MM BIO-1g (Nest and Den Avoidance) would require the County to identify wildlife nests and dens through pre-construction surveys and avoid take of active nests and dens, either through scheduling of project activities outside the nesting/denning season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting or denning wildlife prior to vegetation and habitat removal. With implementation of this measure nesting birds and San Bernardino flying squirrel will be avoided during nesting season which will avoid any direct loss and will reduce these impacts to below a level of significance.

MM BIO-1h (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. With implementation of this measure wildlife would not be at risk of injury or mortality due to entrapment or other project activities and would therefore reduce the impacts to below a level of significance.

MM BIO-1i (Avoid Nocturnal Wildlife) would require the County to carry out project-related construction activities during daylight hours to minimize impacts to nocturnal wildlife. With implementation of this measure nocturnal wildlife will be avoided and any impacts would be below a level of significance.

MM BIO-1j (Manage Project Trash) would require the County to contain project-related trash and remove it from the work area daily. MM BIO-1c (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-1d (Prevent Invasive Weed Introduction), BIO-1e (Speed Limit), and BIO-1l (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, reduce project speed limits to 10 mph, and control fugitive dust. Additionally, MM BIO-1f (Personnel Training) would require the County to present an environmental-education program to project workers on sensitive biological resources. With implementation of these MMs, potential adverse effects would be avoided or minimized and impacts to San Bernardino flying squirrel would be reduced to a less-than-significant level (Class II).

Mitigation Measures

MM BIO-1a Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas. The County of San Bernardino, Department of Public Works or the San Bernardino County Flood Control District (County) will implement all mitigation measures and conditions contained within the Streambed Alteration Agreement obtained from the California Department of Fish and Wildlife (CDFW) for impacts to jurisdictional areas, as well as any permits obtained from the Regional Water Quality Control Boards (RWQCB), State Water Resources Control Board, or U.S. Army Corps of Engineers (USACE), upon determination of jurisdiction and permit issuance by all three agencies. In addition, the following Best Management Practices will be implemented during all construction and maintenance activity in or near drainages, waters, and wetlands:

1. Vehicles and equipment will not operate in ponded or flowing water except as described in the Streambed Alteration Agreement.
2. The County will minimize construction activities and vegetation clearing within drainages to the extent feasible.

3. The County will prevent water containing mud, silt, or other pollutants from grading or other activities to enter drainages or be placed in locations that may be subjected to high storm flows.
4. Spoil sites will not be located within 30 feet from the boundaries of drainages or in locations that may be subjected to high storm flows, where spoils might be washed back into drainages.
5. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from Project-related activities, will not be allowed to contaminate soil or enter drainages.
6. When construction activities are completed, any excess materials or debris will be removed from the work area. No rubbish will be deposited within 150 feet of the high water mark of any drainage during construction of the Project.
7. No equipment maintenance will occur within 150 feet of any streambed and no petroleum products or other pollutants from the equipment will be allowed to enter these areas or enter any off-site jurisdictional waters or wetlands in Little Bear Creek or Strawberry Creek under any flow.
8. The installation of bridges, culverts, or other structures will be such that water flow (velocity and low flow channel width) is not impaired. Bottoms of temporary culverts will be placed at or below stream channel grade.
9. No equipment fueling, hazardous materials storage area, and operation and maintenance activities involving hazardous materials will be sited within 100 feet of any jurisdictional waters or wetlands.

MM BIO-1b

Pre-construction Surveys and Construction Monitoring. The County of San Bernardino, Department of Public Works or San Bernardino County Flood Control District (County) will assign one or more qualified biological monitors to monitor project construction activities and conduct pre-construction surveys. Monitors will be responsible for ensuring that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible. Monitors will also inform on-site construction personnel and County representatives of applicable project mitigation measures, environmental commitments, and permit conditions, and any potential for infraction.

A biological monitor will be present during initial site clearing activities (vegetation clearing, soil preparation, ground disturbance, and removal of rock reinforcement) and during installation of exclusion fencing (if any), and at appropriate intervals throughout construction to ensure compliance with regulatory terms and conditions. In addition, a monitor will conduct clearance surveys for sensitive plant or wildlife resources and active bird nests within or adjacent to the project site within three (3) calendar days prior to each of these activities. If any sensitive resources are found, the biological monitor will take appropriate action as defined in all adopted mitigation measures, environmental commitments, and permit conditions.

Monitoring and survey activities will be documented and, at the conclusion of project construction activities, all monitoring reports and communications will be retained in

project files to allow review by permitting agencies, if requested, unless otherwise required by an agency or stated as a permit requirement.

MM BIO-1c Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss. The County of San Bernardino (County) will minimize impacts and permanent loss of all native vegetation that provides habitat for special-status plants and wildlife, at construction sites by flagging areas to be avoided, as feasible. As feasible, stands of native trees within the temporary impact areas will be flagged for avoidance to reduce impacts to mature trees, which will improve the post-project habitat quality and allow the temporarily impacted areas to restore more quickly. Whenever possible, trees that must be removed from within temporary impact areas will be cut off at ground level and the root structure should be left in place to stabilize the soil and allow the tree to re-sprout after the completion of project construction. In addition, large rocks or outcrops within the temporary impact areas should be avoided and protected in place to maintain wildlife habitat wherever possible.

Within temporary impact areas, topsoil and leaf litter should remain in place during construction unless grading is required. If grading is required, then topsoil and leaf litter will be salvaged and stockpiled on the project site to be used in the restoration of temporarily impacted areas. The trunks of large trees that are removed for project construction should be kept on the project site and incorporated into the post-project landscaping to provide refuge for wildlife and shelter for young plants.

On-site Restoration. To mitigate temporary impacts to sensitive vegetation or habitat that may support special-status plants or animals (e.g., temporary equipment staging areas), the County will prepare and implement an Ecological Restoration Plan, to establish native vegetation cover on all temporary impact areas within five (5) years of the end of construction. The plan will be prepared in coordination with CDFW prior to the start of construction. It will be implemented immediately following the completion of construction and shall be monitored for a period of five years to ensure that the establishment of vegetation is successful. The Ecological Restoration Plan's goal will be to restore native vegetation that will ultimately replace habitat values that are damaged or degraded by the Project and is not necessarily designed to replace in-kind vegetation within a five year period. Instead, the plan is designed to create the baseline conditions that will allow vegetation to establish and be replaced by natural succession over time. The plan will include: (a) quantitative description of habitat to be removed, including vegetation cover (by tree, shrub, and herb components), native species richness, and density of dominant species; (b) soil or substrate preparation measures, such as recontouring, decompacting, or imprinting; (c) provisions for topsoil and leaf litter salvage and storage; (d) provisions for woody debris, tree trunk, and boulder storage and placement; (e) plant material collection and acquisition guidelines, including guidelines for salvaging, storing, and handling seed, cuttings, or rooted plants from the Project site, as well as obtaining materials from commercial nurseries or collecting from outside the Project site; (f) time of year that the planting or seeding will occur and the methodology of the planting; (g) an irrigation plan or alternate measures to ensure adequate water; (h) quantitative success criteria, to reflect yearly progress and final completion; (i) a detailed monitoring program to evaluate conformance with the success criteria; and (j) contingency measures to remediate the restoration site if success criteria are not met.

In addition to the project site, the Ecological Restoration Plan will apply to borrow sites where any native habitat is affected. Due to applicability of the California Surface Mining and Reclamation Act to any such borrow sites, the County will include the Ecological Restoration Plan in any required Mining and Reclamation Plan, and identify the appropriate bonding amount, for review by the California Office of Mine Reclamation. If no borrow material will be used from off-site sources this would not apply.

Compensation. To mitigate permanent impacts to sensitive vegetation or habitat that may support special-status species, the County will provide for long-term habitat replacement by protecting compensation land that will provide habitat value equivalent or greater than habitat removed for the Project. To mitigate impacts to waters of the State, the County will provide compensatory mitigation. Compensation for impacts to waters of the State will be based on the range of functions and beneficial uses of the affected waters. Overall compensation may include off-site habitat restoration or other habitat improvements as needed, to replace habitat components affected by the Project. In addition, the County will provide for long-term conservation management of the compensation land and execute a conservation easement over the property. The County will prepare and implement a Compensation Plan, identifying the proposed compensation lands, proposed habitat improvements and long-term management, and specific legal mechanism for long-term preservation (e.g., parties to the conservation easement and long term management plan). The Compensation Plan may be subject to review and approval by the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), State Water Resources Control Board (SWRCB), or California Department of Fish and Wildlife (CDFW) according to each agency's applicable permit conditions (if any).

In addition, any third-party conservator that will manage the compensation lands should be authorized by CDFW to manage the mitigation lands and appropriate endowment funds. Where non-profit organizations, government entities, and/or special districts are proposed to hold title (i.e., conservation easement), per Government Code section 65967[a], CDFW is required to conduct a due diligence review to ensure that the entity possesses the necessary qualifications and can effectively manage and steward the land, water, or natural resource. Purchase of mitigation credit or payment of an in-lieu mitigation fee may fulfill the habitat compensation requirement if a suitable mitigation bank or similar habitat conservation and management program is available.

Alternatively, if a suitable in-lieu mitigation fee program is located, an appropriate in-lieu mitigation fee may be paid as required by the appropriate permitting agencies.

MM BIO-1d Prevent Invasive Weed Introduction. Precautions will be taken to prevent the introduction of any invasive weeds to the proposed project site. Precautions will also be taken to prevent any invasive weeds from leaving the site. Construction equipment will be cleaned of mud or other potential sources of weed seeds before it arrives at the Project site and also before it leaves the project site. Any reclamation or erosion control seeding will consist of native species, native seed mix, or other ecologically appropriate, non-invasive plants. Only weed-free straw or mulch will be used. Weeds will be managed post-construction, during the restoration of temporary impacts areas, with the use of herbicides, as well as appropriate manual and mechanical methods. If herbicides are used, they will be applied by a licensed herbicide applicator in a manner that minimizes risk to wildlife and non-target vegetation.

MM BIO-1e **Speed Limit.** Vehicle speeds will remain below 10 mph on unpaved roads to reduce wildlife impacts and minimize dust.

MM BIO-1f **Personnel Training.** The County of San Bernardino, Department of Public Works or the San Bernardino County Flood Control District shall present an environmental-education program to all personnel assigned to the Project. The program will describe sensitive resources and associated minimization measures, adopted mitigation measures from the Final Environmental Impact Report, environmental laws and regulations, permits, and all other agency requirements.

MM BIO-1g **Nest and Den Avoidance.** Vegetation removal or ground disturbance for project construction and routine maintenance should take place after a pre-construction survey has taken place to identify any active bird nest or other active denning or nesting wildlife within or adjacent to Project disturbance areas. The County of San Bernardino, Department of Public Works or the San Bernardino County Flood Control District will reschedule vegetation removal activities and delineate a no-disturbance buffer area around the nest or den site. The extent of the buffer area will be determined by the biological monitor, based on the nature of proposed project activities, the animal's tolerance to disturbance (if known), and conservation status of the affected species.

Breeding season for the San Bernardino flying squirrel is not well known and reproduction can potentially take place year-round (Brylski, 1998). Therefore, pre-construction surveys for denning or nesting mammals and reptiles, and implementation of disturbance-free buffers as needed, will be conducted year-round.

MM BIO-1h **Avoid Wildlife Hazards and Entrapment.** The County of San Bernardino, Department of Public Works or the San Bernardino County Flood Control District will ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled or securely covered at the end of each workday. If backfilling or covering is not feasible, these potential pitfalls will be sloped at a 3:1 ratio at the ends as wildlife escape ramps. Project workers or construction monitors will inspect all potential pitfalls daily.

All pipes or other construction materials or supplies will be covered or capped in storage or laydown areas. No pipes or tubing will be left open either temporarily or permanently, except during use or installation. Any construction pipe, culvert, or other hollow materials will be inspected for wildlife before it is moved, buried, or capped. Should wildlife become trapped in excavations, materials, or other project-related situation, the biological monitor will remove it (if feasible and safe) or immediately contact the California Department of Fish and Wildlife. Any wildlife encountered will be moved out of harm's way by the biological monitor, or will be allowed to leave the area unharmed.

Project-related vehicle access, construction activities, and equipment storage will be restricted to established roads, designated access roads, construction rights-of-way, and designated construction, storage, staging, and parking areas. Off-road traffic outside of these designated areas will be prohibited.

MM BIO-1i **Avoid Nocturnal Wildlife.** All Project-related construction activities and routine maintenance will be carried out during daylight hours to minimize adverse effects to foraging or other activities for California spotted owl, San Bernardino flying squirrel, southern rubber boa, special-status bats, and other nocturnal wildlife.

MM BIO-1j **Manage Project Trash.** Trash, especially food items or packaging, will be kept inside vehicles or in self-closing containers and removed from work areas daily.

MM BIO-1k **Minimization and Avoidance Measures for Southern Rubber Boa.** The County of San Bernardino, Department of Public Works or the San Bernardino County Flood Control District (County) will implement the following measures to minimize or avoid potential impacts to southern rubber boa:

- The County will work with the California Department of Fish and Wildlife (CDFW) to obtain an incidental take permit (ITP) for southern rubber boa. The ITP must be obtained prior to start of project activities.
- A qualified biologist will conduct clearance surveys for southern rubber boa on the project site prior to any vegetation removal, rock removal, or initial ground disturbance on the day that such activities are scheduled.
- Exclusion fencing appropriate for snakes will be installed around the perimeter of the project disturbance area footprint to ensure no southern rubber boas enter the work site. If large rocks or rock outcrops within the temporary impact areas can be avoided, the exclusion fence will be routed around these features to avoid impacting them.
- A biological monitor will be on site during fence installation and will conduct clearance surveys of the fence locations prior to installation. The fencing will remain in place for the duration of construction and the biological monitor will periodically inspect the fence for damage. Any damage found will be reported to the County or the County's construction contractor for immediate repair.
- A qualified and permitted biologist will monitor initial vegetation removal and site preparation and will immediately halt work if a southern rubber boa is discovered in the work area. The biologist will move the animal out of harm's way, in accordance with the terms and conditions of the incidental take permit, and details regarding the sighting will be recorded and provided to the County and CDFW within 24 hours. Construction activities may resume when the animal is out of harm's way and the biologist has cleared the work area.
- If a dead or injured southern rubber boa is found on the project site, the biologist will immediately contact CDFW for guidance.

MM BIO-1l **Fugitive Dust Control.** The following dust control measures shall be implemented during project construction:

- All unpaved travel routes/roads shall be effectively stabilized using water at least three times daily.
- All material excavated or graded will be sufficiently watered, prior to excavation or grading, to prevent excessive dust. Watering will occur as needed with complete coverage of disturbed areas. Hauled materials shall be moist while being loaded into or out of dump trucks.
- The soil storage piles, if not covered, shall be watered at an adequate frequency, or sprayed with an environmentally safe chemical stabilizer, to create stabilized surfaces that will minimize wind erosion emissions. Additionally, the soil storage piles shall be watered by hand or covered when wind events are declared.

- Construction activities that occur on unpaved surfaces shall be discontinued during windy conditions when those activities cause visible dust plumes that are transported beyond the site boundary or that remain visible within 100 feet of any occupied residence, school, or public recreation area.
- All haul trucks hauling soil, sand, and other loose materials to or from the project site shall be covered (e.g., with tarps or other enclosures that would reduce fugitive dust emissions) or have at least 18 inches of freeboard.
- Drop heights should be minimized when loading into or unloading out of haul trucks, and gate seals should be tight on haul trucks.
- Disturbed areas shall be minimized, and after active construction activity has ceased, disturbed areas shall be stabilized using non-toxic soil stabilizers approved by the County of San Bernardino, Department of Public Works or San Bernardino County Flood Control District for project use and shall be revegetated as soon as possible after disturbance.
- Construction workers shall avoid driving commuting vehicles on unpaved roads in the Rimforest area and shall park in paved areas or in designated construction parking areas with proper best management practices.
- Other fugitive dust control measures shall be implemented as necessary so that feasible dust controls are equivalent to the most effective measures listed within South Coast Air Quality Management District Rule 403 Tables 1 and 2 for each type of dust causing source category (unpaved roads, storage piles, etc.).

Criterion BR2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS.

Impact BIO-2: Construction activities would result in adverse effects to riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS (Class II).

Common Plants and Wildlife

Vegetation and habitat removal for the temporary and permanent disturbance areas for the attenuation basin(s) could cause displacement or mortality of native plants and most wildlife on the site. Ongoing routine maintenance on a three to five year cycle may also cause similar impacts. Animals would generally leave, or attempt to leave, during equipment operation. Many small mammals and reptiles, as well as nestling birds or eggs, could be crushed by the equipment. Other effects of the project could cause disturbance from fugitive dust, noise, and vibration, entrapment in construction materials or excavations, exposure to hazardous substances accidentally released by vehicles or other equipment, and displacement, injury, or mortality from project-related construction activities. Trash, particularly food trash, left in the work areas may affect wildlife by attracting potential predators, such as common ravens and domestic dogs.

Mortality and displacement for most common plants and animals would be adverse but less than significant according to CEQA because these species are widespread and impacts to individuals within the project site would be minimal compared to the number of common species in adjacent unaffected

habitats. Displacement or mortality of special-status species may meet CEQA criteria as a significant impact, depending on the extent of take and local population conditions. Native birds, nests, and nestlings are generally protected under the Migratory Bird Treaty Act and California Fish and Game Code, regardless of other conservation designations. Thus, mortality of nesting birds (including eggs or nestlings), regardless of other conservation status designations, may violate state and federal regulations.

MMs BIO-1b (Pre-construction Surveys and Construction Monitoring) and BIO-1g (Nest and Den Avoidance) would require the County to identify nests through pre-construction surveys and avoid take of active bird nests, either through scheduling of project activities outside the nesting season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting birds prior to vegetation and habitat removal. With implementation of BIO-1b and BIO-1g, adverse effects to nesting and migratory birds would be minimized. In addition, MM BIO-1h (Avoid Wildlife Hazards and Entrapment) would require the County to minimize hazards to wildlife by avoiding wildlife entrapment and prohibiting vehicle traffic outside of designated work areas and access roads. MM BIO-1e (Speed Limit) would reduce wildlife impacts by maintaining a 10 mph speed limit on all unpaved roads. MM BIO-1i (Avoid Nocturnal Wildlife) would require the County to carry out project-related construction activities during daylight hours to minimize impacts to nocturnal wildlife. MM BIO-1f (Personnel Training) would require the County to present an environmental-education program to project workers on sensitive biological resources. Implementation of mitigation measures would reduce impacts to common plants and wildlife, including nesting birds, to less-than-significant (Class II).

Construction of the attenuation basin(s) and other project components would require the removal of native vegetation, including sensitive natural communities. Table 3.3-4 quantifies the temporary and permanent impacts to vegetation and land cover. Figure 3.3-1 shows the locations of temporary and permanent impacts. Temporary impact areas are portions of the project site that will be cleared for project activities but will be restored at the end of the project. These impacts are temporary, and although not permanent, are considered long-term temporary impacts because of the time required for the vegetation to become established to a pre-construction condition. As feasible stands of native trees within the temporary impacts areas may be avoided, which will improve the post-project habitat quality and allow the temporarily impacted areas to restore more quickly. In addition, trees being removed from within temporary impact areas should be cut off at ground level whenever possible and the root structure should be left in place to stabilize the soil and allow the tree to re-sprout after the completion of project construction. Large rocks or outcrops within the temporary impact areas should be avoided and protected in place to maintain whenever possible to maintain wildlife habitat. Topsoil and leaf litter should also remain in place during construction unless grading is required. Permanent impact areas will be cleared for project activities and will not be restored. These areas will also be routinely maintained on a three to five year interval. Temporary and permanent impact areas are independent from one another.

Table 3.3-5. Temporary and Permanent Impacts on the Proposed Project Site

Vegetation Communities and Cover Types	Area (acres)		Total Impacts
	Temporary Impact Area	Permanent Impact Area	
Arroyo willow thicket	0.32	0.01	0.33
California black oak forest	2.18	0.06	2.24
Red osier thicket	0.37	2.25	2.62
White fir-sugar pine forest	5.56	2.92	8.48
Developed	1.60	0.03	1.63
Total	10.03	5.27	15.30

Sensitive natural communities on the project site are red osier thickets and arroyo willow thickets. These sensitive natural communities would be directly affected by removal of vegetation or by trampling or crushing during construction activities.

Indirect impacts to vegetation could result from alterations in existing topography and hydrology, sedimentation and erosion, soil compaction, accumulation of fugitive dust (which could impact plant photosynthesis and respiration), exposure to hazardous substances accidentally released by vehicles or other equipment, disruptions to seed banks from ground disturbance, or the colonization of non-native, invasive plant species. Absent mitigation, these impacts would be significant. Project operation and maintenance would not cause further significant effects to sensitive vegetation.

Restoration of flows from Strawberry Creek could have downstream impacts to riparian habitat, but these impacts are expected to be minimal since the majority of flows being restored are from storm runoff and snowmelt, both of which have short durations and are highly variable on an annual basis. In addition, an examination of aerial photos of Strawberry Creek from roughly the last twenty years (1994-2015) shows that the downstream riparian vegetation appears to be cyclic around large floods. During these large floods, sediment-laden surface runoff deposits extensive sediment from the landslide area below the community of Rimforest. Large floods, such as those in 1993, 2005, 2010, and 2015 tend to cause large sediment deposits in Strawberry Creek. This sediment deposition covers and/or removes the riparian vegetation. In the years after these floods, the riparian vegetation begins to recolonize the creek at the downstream limits of disturbance and progresses upstream. Riparian vegetation appears to be able to colonize the canyon up to within 0.5 miles of the community of Rimforest, but is unable to progress further upstream, likely due to the steepness of the terrain, lack of perennial surface flows, and the erodible nature of the substrate. From this point downstream an additional 1.5 miles, the watershed has some potential to support riparian vegetation, but periodic sediment deposition and the steep gradient appear to prevent long-term establishment. Approximately 1.75 miles downstream of the community of Rimforest, an unnamed tributary enters Strawberry Creek from the west. It is at this point that riparian vegetation becomes more established and is represented by scattered white alders. Based on the vegetation present, this is likely the highest point in Strawberry Creek where water is present for most of the year. The expected change in flow volume at this location would be a decrease of approximately seven percent and depth may decrease by 13 percent (see Table 3.3-4). Because this section does not appear to provide perennial aquatic habitat and the riparian vegetation is relatively sparse, these changes would have a less-than-significant impact on biological resources. Further downstream, the decrease in flow rate and water depth are reduced to four percent or less and become even more negligible (see Section 3.3.1 for further discussion on Strawberry Creek). In addition,

The increased flows into Little Bear Creek would be captured and regulated by the attenuation basin(s), which would prevent high-flow events from exceeding the baseline high-flow conditions in Little Bear Creek. The attenuation basin(s) would also maintain typical low-flow conditions by allowing normal flows to pass through the embankment and continue down Little Bear Creek. By regulating the discharges from the basin(s), downstream impacts to riparian vegetation and other habitats is expected to be negligible.

MM BIO-1a would require the County to implement BMPs to minimize impacts to wildlife habitats and jurisdictional areas. With implementation of this measure impacts to native vegetation, habitat, and sensitive natural communities would be less than significant because impacts would be reduced on-site and would be minimized off-site. In addition, temporarily impacted areas would be restored on-site and direct impacts to sensitive vegetation and habitats would be offset by off-site habitat that would be acquired, managed, and improved to benefit the biological resources in perpetuity.

MM BIO-1b would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible. With implementation of this measure impacts to common species, native vegetation, wildlife habitat, and sensitive natural communities would be less than significant because biological resources would be identified prior to project activities, avoided as needed, and monitored for the duration to ensure they are not directly impacted.

MMs BIO-1c, BIO-1d, BIO-1e, and BIO-1f would require the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction and spread of invasive weeds, and control fugitive dust. With implementation of MM BIO-1d invasive weeds will be kept from invading the project site or adjacent off-site habitats as a result of project activities. This will reduce impacts from invasive weeds on native habitats, common species, and special-status species to below a level of significance. In addition, implementation of BIO-1e would reduce the likelihood that wildlife would be struck by a vehicle and either injured or killed would therefore be less than significant because it will

MM BIO-1f would require the County to present an environmental-education program to project workers on sensitive biological resources. With implementation of the measures above, impacts to native vegetation, habitat, and sensitive natural communities would be less than significant by minimizing direct loss of habitat and reducing impacts to adjacent habitat and vegetation (Class II).

Mitigation Measures

MM BIO-1a Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas.

MM BIO-1b Pre-construction Surveys and Construction Monitoring.

MM BIO-1c Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss.

MM BIO-1d Prevent Invasive Weed Introduction.

MM BIO-1e Speed Limit.

MM BIO-1f Personnel Training.

MM BIO-1i Fugitive Dust Control.

Criterion BR3: Have a substantial adverse effect on federally protected wetlands, federally protected waters, non-federally protected state waters (SWRCB or RWQCB), and state waters regulated by CDFW through direct removal, filling, hydrological interruption, or other means.

Impact BIO-3: Construction activities could result in a substantial adverse effect on federally protected wetlands, federally protected waters, non-federally protected state waters (SWRCB or RWQCB), and state waters regulated by CDFW through direct removal, filling, hydrological interruption, or other means (Class II).

The delineation of jurisdictional features on the project site identified preliminary State and federal jurisdictional waters and wetlands. Project construction would affect these features, as described above for sensitive native vegetation. Absent mitigation, these impacts would be significant. Projects affecting waters of the State or waters of the U.S. are subject to permitting under the California Fish and Game Code and federal Clean Water Act (CWA). Each project applicant must prepare and submit appropriate applications, notifications, and fees to the USACE (according to Section 404 of the CWA), the CDFW (according to Sections 1600-1616 of the California Fish and Game Code), the RWQCB (according to Section 401 of the CWA), and

the SWRCB (according to Section 402 of the CWA). Federal CWA permitting is required for projects that would place dredged or fill material into jurisdictional waters of the U.S., and State authorization is required if projects would substantially divert or obstruct the natural flow of any river, stream, or lake; substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

Temporary impacts to jurisdictional waters would occur in portions of the project site that may be impacted by project activities but would be restored at the end of the project. This would include recontouring, restoring flow lines, and replanting vegetation. Permanent impact areas would be impacted during project activities and would not be restored at the end of the project. Some of these permanent impacts could lose function entirely while others may still convey water but would no longer be vegetated or provide habitat for wildlife.

Table 3.3-6. Temporary and Permanent Impacts to State and Federal Water and Wetlands in the Proposed Project Site

Jurisdictional Feature	Area (acres)	
	Temporary Impact Area	Permanent Impact Area
Federal Wetlands	0.41	0.32
Federal Waters	0.12	0.05
Total Federal	0.53	0.37
State Waters	0.45	1.07

Under Fish and Game Code and CWA, prior to the start of construction, the County would be required to submit the attached preliminary jurisdictional delineation report (Appendix 4) and obtain permits or agreements from the USACE, RWQCB, SWRCB, and CDFW for project-related impacts to jurisdictional areas. The County would be required to implement all conditions required by the permits and agreements as issued by the resource agencies. To mitigate impacts to waters of the State, the County will provide compensatory mitigation. Compensation for impacts to waters of the State will be based on the range of functions and beneficial uses of the affected waters.

As described in Section 3.6 (Hydrology and Water Quality), existing regulations require that the project obtain a Construction General Permit. The General Permit requires a Storm Water Pollution Prevention Plan (SWPPP) prepared by a qualified SWPPP developer. The SWPPP must list Best Management Practices (BMPs) that will be used to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

MM BIO-1a would require the County to implement BMPs to minimize impacts to jurisdictional areas. MM BIO-1b would require the County to have a qualified biological monitor construction to ensure that impacts to jurisdictional areas are minimized to the extent possible. MMs BIO-1c, BIO-1d, BIO-1e, and BIO-1f would require the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction and spread of invasive weeds, and control fugitive dust. MM BIO-1f would require the County to present an environmental-education program to project workers on sensitive biological resources. MM BIO-1d requires any herbicide use be performed by a licensed herbicide applicator in a manner that minimizes risk to wildlife and non-target vegetation.

Additionally, compliance with SWPPP requirements (project environmental commitment) would minimize impacts from stormwater runoff. Implementation of these measures would reduce impacts to native vegetation, habitat, and sensitive natural communities and jurisdictional areas to less than significant (Class II).

Mitigation Measures

- MM BIO-1a** **Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas.**
- MM BIO-1b** **Pre-construction Surveys and Construction Monitoring.**
- MM BIO-1c** **Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss.**
- MM BIO-1d** **Prevent Invasive Weed Introduction.**
- MM BIO-1e** **Speed Limit.**
- MM BIO-1f** **Personnel Training.**
- MM BIO-1l** **Fugitive Dust Control.**

Criterion BR4: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Impact BIO-4: Construction activities will have impacts to wildlife movement of native wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites (Class III).

According to the California Essential Connectivity Map (Caltrans and CDFW, 2010), the project site is within either a natural landscape block or an essential connectivity area. The western portion of the project site lies within the Strawberry Creek Wildlife Corridor. This wildlife corridor is identified in the San Bernardino County Open Space Overlays (San Bernardino County Land Use Services Department, 2007).

The proposed storm drains would be located within a developed community and would not substantially affect wildlife movement or nursery areas. Due to availability of surrounding habitat east and west of the proposed attenuation basin(s), the basin(s) would not substantially affect wildlife movement for many species. However, the attenuation basin(s) would degrade wildlife habitat long term through the area. In addition, the basin(s) would affect wildlife nursery sites such as nest trees for birds or small mammals; burrows or other nesting areas for ground-dwelling vertebrates; or aquatic nest sites for amphibians. In general, these impacts to wildlife breeding areas would not be substantial for common or wide-ranging species, but could be substantial for special-status wildlife (see C.3.3.1. above). Given the relatively small size of the project disturbance areas, the limited timeline for project construction activities, and the availability of surrounding habitat east and west of the attenuation basin(s) for wildlife movement, the project would have a less-than-significant impact on wildlife movement or the use of wildlife nursery sites, and no mitigation is proposed (Class III).

Criterion BR5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Impact BIO-5: Construction activities may conflict with local policies or ordinances protecting biological resources (Class III).

The San Bernardino County Development Code includes policies regarding the protection and conservation of rare and endangered plants and animal resources and their habitats. It also includes regulations and guidelines for the management of plant resources in the unincorporated areas of the County.

The County would comply with all applicable requirements of the San Bernardino County Development Code. No mitigation measure designed to avoid conflict with local policies or ordinances protecting biological resources would be required and impacts would be less than significant (Class III).

3.3.4 Level of Significance After Mitigation

Compliance with applicable regulations would avoid any conflict with local policies or ordinances protecting biological resources, resulting in a less-than-significant impact (Class III). The Project would have a less-than-significant impact on wildlife movement and the use of wildlife nursery sites (Class III). All other impacts would be reduced to less-than-significant with implementation of mitigation measures (Class II).

3.4 Cultural Resources

A cultural resource is defined as any object or specific location of past human activity, occupation, or use, identifiable through historical documentation, inventory, or oral evidence. Cultural resources can be separated into three categories: archaeological, built environment, and traditional resources.

Archaeological resources include both historic and prehistoric remains of human activity. Historic resources can consist of structural remnants (such as cement foundations), historic objects (such as bottles and cans), and sites (such as refuse deposits or scatters). Prehistoric resources can include lithic scatters, ceramic scatters, quarries, habitation sites, temporary camps/rock rings, ceremonial sites, and trails.

Built environment resources consist of standing historic buildings and structures, the latter of which includes canals, historic roads and trails, bridges, ditches, and cemeteries.

A traditional cultural resource or traditional cultural property (TCP) can include Native American sacred sites (such as rock art sites) and traditional resources that are important for maintaining the cultural traditions of any group.

3.4.1 Environmental Setting / Affected Environment

Situated north and east of the San Bernardino Valley on the North American Plate, the San Bernardino Mountains are the easternmost mountain range in the Transverse Range. The San Bernardino Mountains extend for approximately 60 miles (100 km) east-west on the southern edge of the Mojave Desert in southwestern San Bernardino County, north of the city of San Bernardino. The range is separated from the San Gabriel Mountains to the west by Cajon Pass, and from the San Jacinto Mountains to the south and southeast by Banning Pass. The highest peaks in the range include San Gorgonio Mountain (elevation 11,502 ft), the highest peak in southern California, and other peaks of the San Gorgonio Wilderness. The shorter Little San Bernardino Mountains extend southeast from the range along the eastern side of the Coachella Valley.

The steep northern side of the mountains is separated from the Mojave Block to the north by a fault, while the San Andreas Fault separates the San Bernardino Mountains from the San Gabriel Mountains to the west and the San Bernardino Valley to the south. North of the city of San Bernardino near Waterman Canyon, the San Andreas fault divides into the Mill Creek-Mission Creek fault and the Banning fault; the former extending east across the mountains north of Mill Creek toward the Morongo Valley, while the latter runs southeast through the San Gorgonio Pass. The Precambrian igneous-metamorphic basement complex, consisting of schists, gneiss, and migmatites, surfaces north of the San Andreas fault between Cajon Mountain and Mill Creek. Extensive outcrops of gneiss are also present near San Gorgonio Peak and Sugarloaf Peak. Near Big Bear Lake, these are uncomfortably overlain by upper Paleozoic marine quartzite and limestone that are weakly metamorphosed. These in turn are intruded by Triassic volcanics, and Jurassic and Cretaceous plutonic rocks. During the early Cenozoic, there was erosion of the Cretaceous mountain topography. More tectonic activity extended through the Miocene, and basalts extruded in the eastern part of the range. Faulting and associated compression in the late Pliocene rejuvenated the previously eroded surface, and during the middle Pleistocene, the San Bernardino and San Gabriel Mountains were uplifted along the block and thrust faults. Some flat areas in the San Bernardino Mountains are overlain by Pleistocene alluvium, and there is Wisconsin age glacial till on north San Gorgonio Peak above 8,700 feet.

3.4.1.1 Regional Setting and Approach to Data Collection

For the purposes of cultural resources, the project Study Area includes portions of State Route 18 (SR-18, Rim of the World Drive) and Pine Avenue, and areas along Little Bear Creek and the canyon east of Blackfoot Trail East. The area of potential impact defined for the project includes all disturbance areas along the roads, the flood control channel/basin locations, and the staging area (totaling approximately 15.3 acres).

As currently proposed, the project would occur in two phases. As discussed in Section 2.1, Phase 1 includes approximately 0.8 miles of flood control improvements, comprised of approximately 0.2 miles of channel/basin and approximately 0.6 miles of pipe culvert and appurtenances. Phase 2 of the proposed project includes installation of a culvert system to direct runoff from Pine Avenue, which runs parallel to the south of SR-18, and under SR-18 to join flows restored by Phase 1 in Little Bear Creek. The Phase 2 culvert system would include street inlets and storm drains within Rimforest to facilitate the diversion of flows along Pine Avenue. A culvert system would be installed through an existing lumber yard off Pine Avenue, connecting to the main culvert system along Pine Avenue. Trenching up to depths of 22 feet may be required to install the pipeline from Pine Avenue and under SR-18 to Little Bear Creek.

The Crest Forest Fire District building and property involves approximately 1.2 acres north of SR-18. The property is located at the western boundary of the project area. The project proposes to use this property as a potential staging and flow interception area, and the existing building will not be altered as a result of the project.

For the proposed project, record searches were conducted at the San Bernardino Archaeological Information Center. The record searches included an examination of all previously documented cultural resources within a one-mile radius of the proposed project. A review of relevant historic maps, and excavation and survey reports were also conducted as part of the record searches.

Field surveys were conducted in order to verify the location of any previously identified cultural resources and to inspect lands within the project area. Field surveys are useful for identifying above-ground or surface cultural resources and for identifying high-probability areas. However, negative pedestrian survey results do not preclude the possibility that buried archaeological deposits could be discovered. Applied EarthWorks, Inc. (Æ) conducted pedestrian field surveys of the project area in July 2012 and July 2015 (Smallwood, 2015).

Æ requested a search of the Sacred Lands File (SLF) maintained by the Native American Heritage Commission (NAHC) on July 9, 2012. The NAHC responded on July 11, 2012, stating that Native American cultural resources were not identified within one-half mile of the project area. However, the NAHC requested that Native American individuals and organizations be contacted to elicit information and/or concerns regarding cultural resource issues related to the proposed project. Correspondence was initiated on July 14 and 15, 2015 with the Ramona Band of Cahuilla Mission Indians, the Morongo Band of Mission Indians, the San Manuel Band of Mission Indians, the San Fernando Band of Mission Indians, the Fort Mojave Indian Tribe, the Gabrielino Tongva Nation, and the Serrano Nation of Indians. A second attempt at correspondence was made on July 28, 2015.

The San Manuel Band of Mission Indians responded to both the cultural scoping letter and the Notice of Preparation (NOP) for the proposed project. The Tribe noted that the proposed project is within the Tribe's ancestral territory and requested to be contacted for further consultation if cultural resources are identified during project implementation. The Morongo Band of Mission Indians responded to the cultural scoping letter stating that the project is outside of the Tribe's current reservation boundaries,

but within an area considered to be a traditional use area. Therefore, the Tribe requested a copy of the records search and survey results to better assess the sensitivity of the area. Furthermore, the Tribe requested to be contacted if Native American cultural resources are discovered during project construction. Mr. Ernest Siva, Tribal Elder with the Morongo Band of Mission Indians, had no comments or concerns regarding the project. All Native American correspondence is included in Appendix A of the Cultural Resources Survey Report (Appendix 5) prepared for the project (Smallwood, 2015).

3.4.1.2 Prehistoric Background

Prehistoric archaeological sites in California are places where Native Americans lived or carried out activities during the prehistoric period before Europeans arrived in 1769 A.D. These sites contain artifacts and subsistence remains, and they may contain human burials. Artifacts are objects made by people and include tools (such as projectile points, scrapers, and grinding implements), waste products from making stone tools (flakes and debitage), and nonutilitarian or decorative artifacts (beads, ornaments, ceremonial items, and rock art). Subsistence remains include the inedible portions of foods, such as animal bone and shell, and edible parts that were lost and not consumed, such as charred seeds.

A prehistoric cultural chronology generally used for the San Bernardino Mountains is based on the Mojave Desert chronology, as adapted by Warren (1984). This chronology has been divided into seven cultural complexes: Fluted Point Complex, Lake Mojave Complex, Pinto Complex, Gypsum, Saratoga Springs Complex, Late Complex, and Contact/Ethnographic Complex. Earle et al. (1997) present this chronology in calendar ages. However, for purposes of this report, the prehistoric cultural chronology will begin at the Lake Mojave Complex, and is presented in years Before Present (B.P.) in order to compare cultural periods with paleoclimatic events.

Lake Mojave Complex (10,000-7,000 B.P.)

The Lake Mojave Complex, an expression of the so-called “Western Pluvial Lakes Tradition,” is presumed to begin somewhat earlier than 9500 B.P. and lasting to perhaps 7000 B.P. in the southwestern Great Basin (Basgall and Hall, 1993; Warren 1980, 1984). This cultural manifestation in the early Holocene refers to a long period of human adaptation to environmental changes brought about by the transition from the late Pleistocene to the early Holocene geologic periods. As climatic conditions became warmer and more arid, Pleistocene megafauna perished abruptly between 13,000 and 10,000 B.P. Human populations responded to these changing environmental conditions by focusing their subsistence efforts on the procurement of a wider variety of faunal and floral resources.

Most prehistoric sites of this period have been found within the southwestern Great Basin and the Mojave Desert. Although intact stratified sites dating to this period are very scarce, the limited data do suggest that the prehistoric populations of this period moved about the region in small, highly mobile groups, with a wetland-focused subsistence strategy based on hunting and foraging. The vast majority of archaeological sites dating to this period have been found around early Holocene marshes, lakes, and streams which dominated much of the landscape. These early occupants of southern California are believed to have been nomadic large-game hunters whose tool assemblage included percussion-flaked scrapers and knives; large, well-made fluted, leaf-shaped, or stemmed projectile points (e.g., Lake Mojave, Silver Lake); crescentics; heavy core/cobble tools; hammerstones; bifacial cores; and choppers and scraper planes. The absence of milling tools commonly used for seed preparation indicates that an orientation toward hunting continued throughout this phase. Nonetheless, based on ethnographic models developed for hunting-gathering groups throughout the world, populations of this phase undoubtedly exploited plant resources as well. Indeed, most Lake Mojave deposits investigated in the southwestern Great Basin have yielded some amount of milling equipment, usually large slabs with

ephemeral wear and handstones, implying regular, albeit limited use of vegetal resources (Basgall and Hall, 1993:19).

Pinto Complex (7,000-4,000 B.P.)

In the desert regions of southern California, the “Pinto Complex” succeeded the “Lake Mojave Complex,” beginning at approximately 7000 B.P. and lasting to 4000 or 3500 B.P. Relatively recent paleo-ecological and paleo-hydrological evidence suggests maximum aridity in the desert regions between ca. 7000 and 5000 B.P., with amelioration beginning at approximately 5500 B.P. and continuing through 4000 B.P. (Spaulding, 1991, 1995). During this period, it is believed that populations diminished and dispersed due to the decrease in permanent wetland habitats; thus, the Pinto Complex reflects a settlement pattern in which the population relocated from the ancient lakeshores to seasonal water sources. As well, as an adaptive response to these changing climatic conditions, the Pinto Complex is characterized by necessary shifts in prehistoric subsistence practices and adaptations, with greater emphasis placed on the exploitation of plants and small animals than the preceding Lake Mojave Complex, as well as a continued focus on artiodactyls (Warren, 1980, 1984).

The distinctive characteristics of the “Pinto Basin Complex” as defined by Campbell and Campbell (1935) are projectile points of the Pinto series, described by Amsden (1935) as weakly shouldered, indented-base projectile points that are coarse in manufacture as well as form. Other diagnostic artifact types of this period include: large and small leaf-shaped bifaces; domed and heavy-keeled scrapers; numerous core/cobble tools; large blocky metates evincing minimal wear and small, thin, extensively used milling slabs; and shaped and unshaped manos. Throughout most of the California desert region, sites containing elements of the Pinto Basin Complex (e.g., those in the Pinto Basin, Tiefert Basin, Salt Springs, and Death Valley) are small and usually limited to surface deposits suggestive of temporary and perhaps seasonal occupation by small groups of people (Warren, 1984:413).

Gypsum Complex (4,000-1,500 B.P.)

Several Gypsum Complex sites have been identified in the general Project vicinity. This period is characterized by a trend toward increasingly effective moisture, which began in the late middle Holocene and culminated in a pronounced pluvial episode between ca. 3700 and 3500 B.P. At that time, a number of basins in the Mojave and Owens River drainages supported perennial lakes (Enzel et al., 1992).

In general, the projectile points of this cultural period are fairly large (dart point size), but also include more refined notched (Elko), concave base (Humboldt), and small stemmed (Gypsum) forms. In addition to diagnostic projectile points, Gypsum Complex sites include leaf-shaped points, rectangular-based knives, flake scrapers, T-shaped drills, and occasionally, large scraper planes, choppers, and hammerstones (Warren, 1984:416). Manos and milling stones are common; the mortar and pestle also were introduced during this period. Other artifacts include shaft smoothers, incised slate and sandstone tablets and pendants, bone awls, *Olivella* shell beads, and *Halotis* beads and ornaments. A wide range of perishable items dating to this period was recovered from Newberry Cave, located along the Mojave River near the southern end of the Troy Lake Basin, including atlatl hooks, dart shafts and foreshafts, sandals and S-twist cordage, and tortoise-shell bowls.

Technologically, the artifact assemblage of this period is similar to that of the preceding Pinto Complex; new tools also were added either as innovations or as “borrowed” cultural items. Included are the mortar and pestle, used for processing hard seeds (e.g., mesquite pods [*Prosopis glandulosa*]) and acorns, pine nuts, yucca, and agave, as well as the bow and arrow, as evidenced by the presence of Rose

Spring projectile points late in this period. Ritual activities became important, as evidenced by split-twig figurines (likely originating from northern Arizona) and petroglyphs depicting hunting scenes. Finally, increased contact with neighboring groups likely provided the desert occupants important storable foodstuffs during less productive seasons or years, in exchange for valuable lithic materials such as obsidian, chalcedony, and chert. The increased carrying capacity and intensification of resources suggests higher populations in the desert with a greater ability to adapt to arid conditions (Warren, 1984:420). Large villages or village complexes also appear in the archaeological record during the Gypsum Complex, reflecting a transition from seasonal migration (i.e., seasonal round) to year-round sedentary occupation of the western Mojave Desert (Sutton, 1988).

Saratoga Springs Complex (1,500-800 B.P.)

Because paleo-environmental conditions were little changed from the preceding period, cultural trends in the Saratoga Springs Complex essentially saw a continuation of the Gypsum Complex subsistence adaptation throughout much of the California deserts. Unlike the preceding period, however, the Saratoga Springs Complex is marked by strong regional cultural developments, especially in the southern California desert regions, which were heavily influenced by the Hakataya (Patayan) culture of the lower Colorado River area (Warren, 1984:421–422). Specifically, turquoise mining and long distance trade networks appear to have attracted both the Anasazi and Hakataya peoples into the California deserts from the east and southeast, respectively, as evidenced by the introduction of Buff and Brown Ware pottery and Cottonwood and Desert Side-notched projectile points. The initial date for the first Hakataya influence on the southern Mojave Desert remains unknown; however, it does appear that by about 1000 to 1100 B.P. the Mojave Sink was heavily influenced, if not occupied by, lower Colorado River peoples. Trade with the California coastal populations also appears to have been important in the western Mojave Desert region and helped stimulate the development of large complex villages containing deep middens and cemeteries that have been dated from 2200 to 300 B.P., as well as the trade and movement of large quantities of shell beads and steatite items from the coast.

Brown and Buff Ware pottery, first appearing on the lower Colorado River at about 1200 B.P., started to diffuse across the California deserts by about 1100 B.P. (Warren, 1984:425). Associated with the diffusion of this pottery were Desert Side-notched and Cottonwood Triangular arrow points dating to about 800 to 850 B.P., suggesting a continued spread of Hakataya influences. Trade along the Mojave River also expanded resulting in middlemen between coastal and Colorado River populations. The Hakataya influence in coastal and inland southern California regions appears to have diminished during the late Protohistoric period when the extensive trade networks along the Mojave River and in Antelope Valley appear to have broken down and the large village sites were abandoned (Warren, 1984:427). Evidence presented by Jones et al. (1999) points to the apparent concordance between the reduction in use of the interior desert and the Medieval Climatic Anomaly. This period, lasting from approximately 1100 to 550 B.P., was typified by increased aridity here as elsewhere in the southwest (Stine, 1994; Warren, 1984:427). This dry period may have led to the withdrawal of southwestern Native populations, such as the Anasazi, from marginal desert areas. Warren (1984:428) also suggests that the apparent disruption in trade networks may have been caused by the movement of Chemehuevi populations southward across the trade routes during late Protohistoric times.

Late Prehistoric Complex (800-300 B.P.)

The Medieval Warm extended into the Late Prehistoric Complex, ending about 550 B.P. The cultural trends and patterns of land-use which characterized the Medieval Warm Interval, including that portion which extends into the earlier part of the Late Prehistoric Complex, were discussed above. At the end of

the Medieval Warm, however, and lasting throughout the ensuing Contact/Ethnographic times, a period of cooler temperatures and greater precipitation ushered in the Little Ice Age during which time ecosystem productivity greatly increased along with the availability and predictability of water (Spaulding, 2001).

The Late Complex reflects an adaptive modification of the cultural developments that were established during the Saratoga Springs Complex. With the waning of the Medieval Climatic Anomaly, desert settlement is believed to have expanded. Bettinger and Baumhoff (1982) propose an expansion of Numic-speakers around 800 B.P., possibly precipitated by this climatic crisis, while Moratto (1984) has suggested an earlier beginning date for this expansion (1000–900 B.P.), perhaps associated with prolonged drought. However, it is not currently known what effect Numic expansion had on the immediate Project area as Uto-Aztecan-speakers appear to have moved into the area during an earlier period.

Socioeconomic and sociopolitical organization continued to increase in complexity during this period, and by this time the “desert village” model of settlement appears to have become generalized in at least some areas of the western Mojave Desert. This model is based on population-driven sedentism and geographical limitation of gathering and hunting territories as accompanied by ever more intensive exploitation of a larger array of less attractive and less cost-efficient food resources (Earle et al., 1997).

With the return of wetter conditions around 500 B.P., there is some evidence of population increase in southern California and archaeological evidence indicates that the Late Complex populations utilized a greater variety of subsistence resources. This included the exploitation of both small and large mammals, and in some areas, fish. The continuation of milling technologies reflect a persistence of seed collecting, and the frequency of special purpose sites increases proportionally with a growing awareness of resource availability and potential (McIntyre, 1990).

3.4.1.3 Ethnographic Background

Historically, the project area is located within Serrano territory. Altschul et al. (1989) have provided a useful overview of the ethnographic land-use patterns, social organization, and early ethnohistorical interactions in Serrano territory. Pertinent aspects of this overview, along with ethnographic information obtained primarily from Strong (1929), Gifford (1918), Kroeber (1925), Bean and Smith (1978), and Bean et al. (1981) are presented below.

Serrano

The Serrano, or “mountaineers” in Spanish, occupied the territory of the San Bernardino Mountains east to Mount San Gorgonio, the San Gabriel Mountains west to Mount San Antonio, and portions of the desert to the north and the fringe of the San Bernardino Valley to the south (Kroeber, 1925:615–616). Numbering no more than perhaps 1,500 people, the Serrano were scattered over a rugged, expansive landscape. The Serrano were Shoshonean peoples, speakers of languages in the Takic sub-family of the larger Uto-Aztecan language family, and their ancestors are presumed to have entered southern California some 1,500 years ago from the Great Basin (Kroeber, 1925:578–579). Their most intensive cultural contacts were with the Pass Cahuilla, who occupied the territory to the southeast, and the Gabrielino, who occupied the lands westward to the Pacific coast.

The term “Serrano” is properly applied to just one of four original Serrano subgroups, the others being the Alliklik, Vanyume, and Kitanemuk; all were closely linked linguistically, but were not a tribe with a recognizable political unity (Strong, 1929:5–6). The Serrano subgroup occupied the portions of the San

Bernardino Mountains and Valley that encompass the Project area, and thus this term refers here to the smaller cultural unit.

Serrano clans were politically autonomous, although linked by ceremonial ties to other clans and peoples of other tribal groupings (i.e., the Cahuilla and Gabrielino). A moiety structure conditioned Serrano social life, all clans belonging to either the Coyote or Wildcat moiety, and all spring ceremonial and mourning obligations extending to at least one other clan (Strong, 1929:12–13). Exchanges of shell money between clans occurred during ceremonies, and contributions of shell money were made to mourning clan leaders by members of other clans on occasions of death. These moieties were exogamous, while clan organization was both patrilineal and exogamous. Although some have suggested that the clans were totemic, Gifford (1918:218) disagrees. Gifford attributes the patrilineal clan and moiety form of organization to links with southwestern tribes (Gifford, 1918:218); others would identify Serrano organization as a typically Shoshonean social structure.

Each Serrano clan had a hereditary leader, or *kika*, and an assistant who was a ceremonial leader, or *paha* (Strong, 1929:17–18). These individuals were central to the ritual life of the Serrano, providing leadership during yearly ceremonial periods. In the context of discussions concerning mourning ceremonies, Strong (1929:32) indicates, “Immediately after death, much of the property of the deceased was destroyed,” and Bean and Smith (1978:572) note that cremation was practiced concurrent with the destruction of most of the deceased’s possessions.

Kroeber (1925:617) indicates that villages were generally located where streams emerged from the foothills. Bean et al. (1981:85–86) are considerably more precise in their descriptions of Serrano village and camp locations. Groups of lineages lived in villages at the valley margins in the winter and in smaller encampments at higher elevations in the summer. Proximity to water sources and adequate arrays of resources predictably dictated settlement location choices. Localities rich in oaks, pinyon, yucca, agave, or seasonal migratory fowl, for example, were favored for population convergence at peak “harvest” times. Streamside areas, canyon mouths by alluvial fans, and flats near springs or lakes were frequently chosen as prime locations, with avoidance of wind and floods, and adequate defensive position also of considerable concern. Bean et al. (1981:85) note also that individual homes were quite scattered across the landscape in order to ensure privacy, to the extent that some “villages” covered up to five square miles. This clearly has important implications for archaeological interpretations of occupation sites.

Serrano residences were circular, domed, willow-and-tule thatch structures. The home of the *kika* also served as a large ceremonial house, and large, semi-subterranean, earth-covered sweathouses were found immediately adjacent to streams in most villages (Bean and Smith, 1978). Subsistence during winter months consisted mostly of reliance on stored foods (acorns, pinyon nuts, mesquite beans) and some fresh meats and greens. In the spring, agave, cacti, greens, and a mix of game provided the bulk of the food resources. Many fruits and seeds became available during the summer months, but perhaps the richest season was autumn, when major harvests of acorns, pinyon nuts, mesquite beans, and screwbeans occurred, and when communal rabbit hunts took place in the context of much feasting and ritual activity (Bean et al., 1981:86–87). In addition to occupation sites and food procurement sites, rock cairns (“offerings” places along trails), cupule petroglyph sites, hot springs (sacred areas), sources of lithic materials suitable for the production of stone tools and other artifacts, and trails represent important land uses by the Serrano.

During the early historic era, Serrano peoples and their culture were dramatically affected by the Spanish mission system. San Gabriel Mission was established in 1771 in the Los Angeles area, and baptisms of Serrano individuals began by 1785. Much later, in 1819, a new mission *asistencia* was founded in the San Bernardino Valley at the Indian rancheria of *Guachama*. An irrigation ditch (the Mill

Creek Zanja) was built with Serrano labor in 1819–1820, and agriculture became important in the valley. A more thorough review of relations between native inhabitants and early missionaries and explorers in the region is provided in the following sections.

3.4.1.4 Historical Background

The historical background of the San Bernardino Mountains and adjacent areas is best presented by adhering to the familiar divisions of local history which have become standardized in the area literature. Beginning with the Spanish (Mission) Period in 1771, the progression moves rapidly through the poorly documented Mexican (Rancho) Period into the American Period, marked by the arrival of Mormon scouts in 1850. The Post-Mormon American Period begins with the recall and departure of the Latter Day Saints in 1857, and continues into modern times. In the following discussion, important regional historical events during these periods are summarized, followed by a more detailed discussion of the historical developments in the immediate project vicinity.

European Exploration Period (1771-1810)

The earliest significant moment in the recorded history of the region was the arrival of Portola's former Lieutenant Pedro Fages who, as military governor, accompanied an expedition from San Diego in pursuit of deserters from the Presidio. Fages kept a journal which recorded that the party traveled along the west side of the San Jacinto Mountains to what is now Riverside, continued north into the San Bernardino Valley, and then crossed into the Mojave Desert by way of the Cajon Pass (Allen, 1974:24). The record of Fages' transit across the San Bernardino Valley in 1772 is the first written account of the area to have survived into modern times.

European settlement and development of the San Bernardino Valley proceeded slowly. The year 1819 is often cited as when the San Bernardino *asistencia*, or mission outpost, was established at *Guachama*; the site of the outpost is near the present location of the restored *asistencia* on Barton Road. The following year, the local Indians began construction of the *zanja*, or ditch, under the direction of Father Zalvidea from Mission San Gabriel. The *zanja* was completed in 1823 (Knight et al., 1962:2). During the late 1810s and early 1820s, the San Bernardino *asistencia* was active, functioning as the rancho headquarters.

In 1826, the first American citizen to enter California over land, trapper and mountain man Jedediah Strong Smith, reached the San Bernardino Valley. Guided by Mohaves, as was Father Garcés, Smith left the Colorado River on November 10, 1826, and arrived at the summit of Cajon Pass 15 days later. He and his men were taken in and cared for at a rancho some five miles short of San Gabriel, where they gave themselves up to the Mexican authorities. Smith's party left San Gabriel, apparently for his Salt Lake camp, on January 18, 1826 (Morgan, 1953:243), with warnings from the Mexican authorities to never return to California. Despite the warnings, Smith returned to California and the San Bernardino Valley the following August, 1827, again by way of the Cajon Pass. Detained for several months by the Mexican authorities and determined never to return, Smith was eventually allowed to leave on December 30, 1827.

The unsettled political condition of California during the 1820s was in part due to the turmoil in Mexico in the wake of the revolution. Most disturbing in California were the decrees issued by the Mexican authorities for the secularization of the mission system. The Indians were "liberated" by decree in 1826, followed by orders for the withdrawal of the Franciscans a few years later (Elliot, 1883:27). On August 17, 1833, the Mexican Congress passed the Secularization Act which placed all mission property into the hands of civil administrators. The former Mission Indians became the most vulnerable victims in the

resulting shuffle and land grab, and their numbers were rapidly decimated by disease and culture shock. Those Indians surviving on rancherias throughout the valley apparently experienced mainly a change of masters, from padre to California ranchero. This relationship of California “pardon” and Indian stock tender worked as well as any system could for the aboriginal population.

In the 1830s and 1840s, the Southern Paiute and Mohaves with their well-developed warrior class and knowledge of the trails and desert water holes, began their most aggressive raids on these early outposts. After their first raid in 1832, Paiutes again attacked the San Bernardino asistencia in October 1834, killing Christianized Indians and taking stored grain and altar vessels (Knight et al., 1962:2). They returned again in December 1834, burned buildings, and took Father Esteneza hostage. This last attack, coupled with the decree of secularization, dealt the final blow to the San Bernardino asistencia; it was abandoned shortly thereafter.

The Rancho Period (1834-1850)

Throughout the Rancho Period, the ranchers in the San Bernardino Valley were plagued by large stock losses (primarily horses) resulting from the Indian raids. By 1840, the “Hawk of the Mountains,” Walkara, said to be chief of the Ute Indians, was leading well-organized raids on the valley. Walkara commanded a band of 200 men “all of whom were well armed with the best American guns and riding in Spanish saddles on the best mounts available in the western region of North America” (Waitman, n.d.:5).

In 1842, in a desperate attempt to protect their stock animals, Juan Bandini, owner of the Jurupa Rancho, and the Lugo family, who had received eight leagues of the Rancho San Bernardino, and had moved into the abandoned asistencia for the purposes of settling and raising stock, decided to contract for protection with a group of New Mexicans under the leadership of Lorenzo Trujillo, a native of Taos and of Pueblo Indian descent. In exchange for good land for settlement by the New Mexican clan, the “Fighting Trujillos” agreed to establish a colony in the valley and thus protect the ranchero’s property. They accepted the Lugo family’s offer first, and then in 1843 the majority moved to land later known as the “Bandini Donation,” consisting of one-half league on the Jurupa Rancho (Vickery, 1977:31).

With these two native settlements guarding the valley, the problem of marauders entering by way of Cajon Pass began to diminish. Often with ranchero Don Benito Wilson in command, mounted parties rode up into the mountains in pursuit of Walkara and his men, which reduced the success and frequency of the raids. However, they were unable to defeat Walkara, who continued actively raiding almost up to his death in 1855 (Waitman, n.d.:9).

The earliest historically known use of the Santa Ana River Canyon as a transportation route in the San Bernardino Mountains took place in 1845, when Benjamin Wilson led a party of men up the canyon in an expedition against the Indians who had been raiding livestock in the San Bernardino Valley area. The account of Wilson’s travels is significant in that it served as the basis for subsequent use and exploration of the route and San Bernardino Mountain region (Arnold et al., 1987).

The American-Mormon Period (1851-1857)

Wilson’s trip up the Santa Ana Canyon opened a new pathway to the mountains. In particular, the stories told of encountering and killing numerous bears at what is now Big Bear Lake served to attract trappers and to develop the fur trade in the San Bernardino Mountains (Drake, 1949:13). Trappers undoubtedly utilized the Santa Ana Canyon route as a means of access to the Big Bear area, and their successes most certainly led to a more general circulation of knowledge regarding the region.

A far greater impact to the region was the direct result of the development of the lumber industry. The Mormon Period from 1850 to 1857 initiated "...major farming efforts and the start of timber-cutting in the mountains...From this time on, there was widespread homesteading and farming with the diversion of the mountain streams for irrigation" (Hill, 1985:3–4). Although the rugged nature of the Santa Ana Canyon precluded the transportation of lumber, it is likely that the canyon was used as an exploration route into the interior region. Following the discovery of gold in the mountains around Bear Lake in 1860, lumbering would rapidly become a major industry in the Bear Valley area (Johanneck, 1975:47).

During the period from 1845 to 1860, the route to Bear Valley by way of Santa Ana Canyon was traveled by hunters, trappers, lumbermen/explorers, and prospectors. From 1855 to 1860 the canyon was relatively heavily utilized by miners, setting the stage for a true gold mining boom. Santa Ana Canyon was established as the gateway to the gold fields following Billy Holcomb's gold discovery in what is now referred to as Holcomb Valley (Hatheway, 1987).

The Mormon experience in California has its roots in the Mexican-American War years (1846–1848) when the Mormon Battalion was formed in Iowa and sent to California. Although too late to participate in the battle, the Mormon soldiers did observe the San Bernardino Valley during the fall harvest, and returned to Salt Lake with glowing reports of the area's potential. On March 14, 1851, a group of approximately 500 Mormons left Salt Lake with the intention of establishing a Mormon colony in the area. Camping for the summer in a sycamore grove in Cajon Pass, the Mormon families waited for the results of their leaders' negotiations to buy land to build their town. In September, 1851, Mormon leaders Lyman and Rich bought the 35,000-acre Rancho de San Bernardino from Antonio Lugo for \$77,500, and development of the town was immediate (Allen, 1974:33). A stockade was constructed, crops were planted, and a road was built up into Waterman Canyon for lumber. In 1852, a grist mill was completed, and in the following year the first county election was held, and the post office in San Bernardino was opened (Knight et al., 1962:6). However, after several years of prosperity, in 1857 trouble between the Mormon Church and federal government became so intense that Brigham Young called the faithful to return to Salt Lake City. Roughly two-thirds obeyed, packed their belongings, and in the winter of 1857–1858, left their homes for Salt Lake City.

The American Period (1850-1880s)

Through the 1860s, it was initially the freight wagon trains bound for Fort Mojave under military escort which functioned to restore law and order in the San Bernardino Valley. The once little town of San Bernardino became a major trade and outfitting center, catering to the increasing commercial stage and wagon traffic. However, those residing in the valley were to face three major disasters during the decade of the 1860s.

In 1862, a smallpox epidemic, which began in Los Angeles, swept the entire state taking many thousands of lives, and decimating the San Bernardino Valley's Indian population. Deaths were said to be so numerous that bodies of the victims were left in the open for days before undertakers could bury them (Waitman, n.d.:56). Also in 1862, a major flood struck the valley and dramatically changed the topography. What once had been fertile bottomland below Santa Ana Canyon and Mill Creek became a wide, rock-filled wash unfit for agricultural purposes (Altschul et al., 1989:73). Following the flood in the winter of 1861-1862, a drought hit southern California; almost no rain fell until February, 1864, by which time thousands of livestock had died from hunger and thirst. One estimate based on census data showed a loss of 71 percent of the total cattle in Los Angeles County (Cleland, 1941:180). Considering that cattle-ranching had been the dominant occupation of the California residents of the San Bernardino Valley up to this time, the impact of the drought was catastrophic to say the least.

Desperate for water, ranchers in the San Bernardino Valley drove their cattle and sheep up through the canyons and into the high country of the San Bernardino Mountains for summer pasture. By 1864, Holcomb and Bear Valleys, as well as Coxey Meadow, Little Pine Flat, and Big Pine Flat were full of grazing cattle, horses, and sheep. The first real cattle ranch in the San Bernardino Mountains was H.E. Parrish's Mojave Rancho along the west fork of the Mojave River in Summit Valley. Parrish drove his cattle there during the 1862 drought and patented 160 acres the following year. In late 1863, Parrish sold his Mojave Ranch to Elijah K. Dunlap for \$2,500, "together with the Rocking P brand and 400 head of neat cattle" (Robinson, 1989). Dunlap built a ranch house and other buildings, and patented 400 additional acres in Summit Valley. The Dunlap Ranch was a major cattle operation during the remainder of the 1860s (Robinson, 1989).

Through the 1860s to 1870s, San Bernardino continued to draw settlers and tradesmen. Citrus farming, which would eventually become an extremely important economic factor in the area's history, was introduced by Anson Van Leuven in 1862 (Knight et al., 1962:10). Other dramatic changes to the San Bernardino Valley and surrounding mountain regions occurring during the 1860s through the 1880s were brought about by an intensification of silver and gold mining operations within the mountains and the deserts beyond. Lumbering came to the San Bernardino Mountains in 1883 when Oscar Newberg and Dan Rathbun erected their Summit Shingle Mill at Cedar Springs on the west fork of the Mojave River. In 1884 Charles Bennett and John Shaver bought the saw mill and moved it higher into the Mountains.

By 1890, San Bernardino County had a population of about 35,000, the vast majority of whom lived west of the Cajon Pass. The largest city in the valley was San Bernardino which, by this time, had artesian municipal water, gas and electric lighting, several banks, newspapers, churches, schools, and a developed road system. Riverside was the second largest city, but was soon to become the seat of its own county. Other population centers established by this time were Colton, Redlands, South Riverside, Rincon, Etiwanda, Grapeland, and Ontario (Allen, 1974:34).

In 1883 the California Southern Railroad, later known as the Atchison Topeka & Santa Fe Railroad (AT&SF), was built over the Cajon Pass; the railroad reached the Atlantic & Pacific Railroad (later known as the Union Pacific Railroad) junction in Barstow/Dagget in 1885. Throughout the 1890s and the early 1900s the railroads were looked upon as the primary means to accomplish any and all transportation needs. Although easily able to make the ascent up Cajon and San Geronimo Passes, a railroad was not the solution to the transportation problem faced by the San Bernardino Mountain resorts. In 1887, the San Bernardino, Arrowhead and Waterman Railroad were incorporated to build a line up Waterman Canyon; however, the track was laid only as far as Harlem Springs. The first railroad to reach the top, an electric line between Arrowhead Hot Springs and San Bernardino, was built in 1906 (Carrico et al., 1982:4-30).

Lumbering, dam building, road improvement, and sporadic mining continued in the San Bernardino Mountains through the late 1800s and early 1900s. The Big Bear District began to acquire permanent residents, and recreation became the theme of mountain land use. A number of camps were established during these years which promoted recreational use of the mountains, such as Skyland Camp, Pioneer Camp, Elder's Grove Camp, Blue Jay Camp, and others (Carrico et al., 1982:4-46). In 1893, President Benjamin Harrison created the San Bernardino Forest Reserve, which became a national forest in 1907 (Knight et al., 1962:23). Gus Knight's Big Bear Hotel opened in 1888, and attracted many tourists into the mountains until it burned down in 1900. It was replaced, however, and eventually evolved into the Pine Knot Lodge. The community of Big Bear Lake grew up around the lodge, supported by the increasing popularity of all mountain resorts (Carrico et al., 1982:4-69).

The advent of the automobile caused a dramatic increase in the mountain recreational industry, which for years had struggled with limited, and somewhat difficult, access into the rugged, steep terrain. The first automobile reached the crest of the San Bernardino Mountains in 1907. In 1910, the first truck to make the top was hauling cement for the Lake Arrowhead Dam (Knight et al., 1962:29). The early automobile routes were expensive toll roads and they were dangerous to drive. Finally in 1915, the “Rim of the World Drive” up Waterman Canyon was completed as a public highway open to motorized vehicles.

Rim of the World Drive. Dedicated on July 17 and 18, 1915, the Rim of the World Drive was touted as a 101-mile-long scenic auto route that was immediately recognized as a true wonder of engineering and beauty, where rugged canyons and mountain peaks were conquered and nature’s wonder was miraculously revealed at every turn. The “Rim” route opened the mountains to a new generation of tourists, campers, and holiday seekers. By 1917, the regular holiday pilgrimages had begun in earnest, and mountain auto stages had established regular service over what was now a State highway (Hatheway, 2009).

By the mid-1920s, California highway planners and engineers realized that the capacity of the now famous Rim of the World Drive had exceeded all expectations. On a holiday weekend such as Memorial Day or Labor Day, it could take up to four hours to reach the crest from San Bernardino, and lines of traffic snaked up the mountain until well after midnight. As a result, a “High-Gear” road was planned that eliminated dreaded switchbacks, and ideally allowed the driver of a totally stock automobile to travel from San Bernardino to the mountain crest entirely in high gear. First planned in the mid-1920s, construction was underway by 1928, the switchbacks were eliminated by 1931, and the completed highway was officially opened on October 21, 1933. Scenic rockwork and chains were later added as part of a W.P.A. funded program to increase the safety and beauty of the drive. On February 10, 1936, the Lake Arrowhead Women’s Club honored highway engineer E. Q. Sullivan for his work on the newly improved highway (Hatheway, 2009).

Construction of the high gear road on the Rim of the World Drive was a genuine breakthrough. By the early 1930s, mountain resorts and communities were linked to the valley by a blacktop highway, better facilitating the huge Memorial Day, Fourth of July, and Labor Day weekend traffic blowouts. Roadway improvements continued, and by the late 1960s, the present four lane route was completed “up the hill.” The segment of the Rim of the World Drive/Highway 18 from the Crestline Cut-Off to Rim Forest was completed during the years 1930–1933. Today the historic Rim of the World Drive threads its way through the most urbanized mountains in America. Assembled from many component parts and continuously realigned and rebuilt from 1915 to the late-1960s, it is the very “backbone” of the San Bernardino Mountains connecting all towns, resorts, and recreation areas (Hatheway, 2009).

Town of Rimforest. The area in the vicinity of today’s Rimforest community is reported to have once been known as Redwood Springs Ranch, under the ownership of Samuel A. Thompson (Hatheway, 2011). Little development activity took place in the area until April 1, 1921, when Thompson was granted rights to Lots 10 and 13 of Section 29, and Lots 11, 12, and 16 of Section 30, Township 2 North, Range 3 West of the San Bernardino Meridian, California, comprising nearly 47 acres (BLM, 2014). Thompson, and his wife Mary, quickly subdivided their newly acquired land. Today, the central portion of the San Bernardino Mountain community of Rimforest is primarily comprised of four tracts filed between 1921 and 1946. The first two tracts were filed by S. A. Thompson and Mary E. Thompson in 1921 and 1929. Rim of the World Subdivision Number 1 was filed in 1921, and Rim of the World Subdivision No. 2: Tract No. 2414 was filed in 1929. Two tracts, Tract No. 2797 and Tract No. 2986, were subdivided in 1946 (Hatheway, 2011).

Historic aerial photographs from 1938 and 1953 indicate that considerable growth took place during the period of time between photographs (Historic Aerials.com, 2014). In 1938, there was little development in the area, and it was confined to construction directly adjacent to Highway 18 (Rim of the World Drive). By 1953, however, additional buildings appear to have been built within the two tracts filed in 1946 (Tract No. 2797 and Tract No. 2986), expanding the limits of the town beyond the frontage of the Highway. Considerable new construction also took place in both directions along Highway 18.

In Lewis Garrett's, *Place Names of the San Bernardino Mountains* (1998), published by the Big Bear Valley Historical Society, he describes the town of Rimforest as a residential and commercial community on Highway 18 near its intersection with Daley Canyon Road, where various lumber, hardware, glass and other building supply and maintenance companies serving the area are located, as well as homes. The first post office at Rimforest opened in 1949 (Hatheway, 2011).

3.4.1.5 Rimforest Storm Drain Project

The proposed project area contains one previously documented cultural resource (Rim of the World Drive; P-36-007049) (Smallwood, 2015). In 1915, the Rim of the World Drive was touted as a 101-mile-long scenic auto route that opened the mountains to a new generation of tourists, campers, and holiday seekers. This built environment resource was originally recorded by the San Bernardino National Forest in 2001. The segment of this resource located within the project area was documented and evaluated during the pedestrian survey of the project area and was recommended as eligible for listing on the California Register of Historical Resources (CRHR). Although no other cultural resources were identified within the project area, the portion of the project around Little Bear Creek was identified as being sensitive for buried archaeological remains.

3.4.2 Applicable Regulations, Plans, and Standards

3.4.2.1 State

California Environmental Quality Act

Cultural resource management work conducted as part of the proposed project is to comply with the California Environmental Quality Act (CEQA) Statute and Guidelines, which direct lead agencies to first determine whether cultural resources are "historically significant" resources. CEQA requires that impacts that a project may have on cultural resources be assessed and requires mitigation if significant (or "unique") cultural resources are to be impacted (Section 21083.2 [a-1] and Appendix K). Generally, a cultural resource is considered "historically significant" if the resource is 45 years old or older, possesses integrity of location, design, setting, materials, workmanship, feeling, and association, and meets the requirements for listing on the California Register of Historical Resources (CRHR) under any one of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,
4. Has yielded, or may be likely to yield, information important in prehistory or history (Title 14 CCR, § 15064.5).

The statutes and guidelines specify how cultural resources are to be managed in the context of projects, such as the proposed Rimforest Storm Drain Project. Briefly, archival and field surveys must be conducted, and identified cultural resources must be inventoried and evaluated in prescribed ways. Prehistoric and historical archaeological resources, as well as built environment resources such as standing buildings, structures, and objects, deemed “historically significant” must be considered in project planning and development.

If a Lead Agency determines that an archaeological site is a historical resource, the provisions of California Public Resources Code (CPRC) §21084.1 and CEQA Guidelines §15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site is to be treated in accordance with the provisions of PRC §21083 regarding unique archaeological resources. The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of a project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines §15064[c][4]).

If human remains of any kind are found during construction activities, CEQA Guidelines Section 15064.5(e) and Assembly Bill 2641 are to be followed. These require that all construction activities cease immediately and the County Coroner and a qualified archaeologist must be notified. The coroner will examine the remains and determine the next appropriate action based on his or her findings. If the coroner determines the remains to be of Native American origin, the Native American Heritage Commission (NAHC) must be notified. The NAHC will then identify a most-likely descendant to be consulted regarding treatment and/or reburial of the remains.

Native American Heritage Commission

Public Resources Code Sections 15064.5(e) and 15064.5(d), et seq.

This code requires that excavation activities be stopped whenever human remains are uncovered and that the County coroner be called in to assess the remains. If the County coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours. At that time, the lead agency must consult with the appropriate Native Americans as identified by the Native American Heritage Commission and the lead agency, under certain circumstances, should develop an agreement with the Native Americans for the treatment and disposition of the remains.

3.4.2.2 Local

County of San Bernardino

The County of San Bernardino General Plan has the following policies regarding cultural resources:

- **Policy CO 3.1:** Identify and protect important archaeological and historic cultural resources in areas of the County that have been determined to have known cultural resource sensitivity.
- **Policy CO 3.2:** Identify and protect important archaeological and historic cultural resources in all lands [where activity] involves disturbance of previously undisturbed ground.
- **Policy CO 3.3:** Ensure that important cultural resources are avoided or impacts minimized to protect Native American beliefs and traditions.
- **Policy CO 3.5:** Ensure that important cultural resources are avoided or minimized to protect Native American beliefs and traditions.

3.4.3 Environmental Impacts and Mitigation Measures

3.4.3.1 Significance Criteria

The proposed project would result in significant impacts to cultural resources if it would:

- *Criterion CR1: Cause a substantial adverse change in the significance of a historical or archaeological resource as defined by State of California guidelines.*
- *Criterion CR2: Disturb human remains, including those interred outside of formal cemeteries.*

Under all of these criteria, adverse changes and impacts include the following:

- Physical, visual, or audible disturbance resulting from construction, operation, and development that would affect the integrity of a resource or the qualities that make it eligible for the CRHR;
- Exposure of cultural resources to vandalism or unauthorized collecting;
- A substantial increase in the potential for erosion or other natural processes that could affect significant cultural resources; or
- Neglect of a significant cultural resource that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to a Native American tribe.

3.4.3.2 Impact Assessment Methodology

Cultural resources are places or objects that are important for historical, scientific, and religious reasons and are of concern to cultures, communities, groups, or individuals. These resources may include buildings and architectural remains, archaeological sites and other artifacts that provide evidence of past human activity, human remains, or Traditional Cultural Properties.

Within the State of California there are provisions in CEQA, its Guidelines, and other provisions of the California Public Resources Code for the protection and preservation of significant cultural resources (i.e., “historical resources” and “unique archaeological resources”). The CEQA Guidelines provide four ways in which a resource can be a “historical resource,” and thus a cultural resource meriting analysis: (1) the resource has been formally determined eligible for, or listed on, the National Register of Historic Places (§5024.1(d)(1)); (2) the resource is listed on the CRHR; (3) the resource is included in a local register of historical resources (pursuant to §5020.1(k) of the Public Resources Code), or identified as significant in an historical resources survey (meeting the criteria in §5024.1(g) of the Public Resources Code); or (4) the lead agency determines the resource is “historically significant” by assessing CRHR listing guidelines that parallel the federal criteria. (§15064.5(a)(1)-(3) of the CEQA Guidelines (as amended)). To qualify as a historical resource under (1), (2) or (4), the resource must also retain the integrity of its physical identity that existed during its period of significance. Integrity is evaluated with regard to retention of location, design, setting, materials, workmanship, feeling, and association (14 C.C.R. 4852(c)). Finally, under California State law, Native American human remains and associated grave goods are granted special consideration.

Direct and Indirect Effects Analysis

Direct impacts to cultural resources are those associated with project development, construction, and co-existence. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or

demolition of overlying structures. Construction can have direct impacts on historical built-environment resources when those buildings or structures must be removed to make way for new buildings or structures or when the vibrations of construction impair the stability of historical buildings or structures nearby. New buildings or structures can have direct impacts on historical built environment resources when the new buildings or structures are stylistically incompatible with their neighbors and the setting, or when the new buildings or structures produce a harmful effect to the materials or structural integrity of the historical built environment resources, such as emissions or vibrations.

Generally speaking, indirect impacts to archaeological resources are those that may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historical built environment resources can suffer indirect impacts when project construction creates potentially damaging noise and vibration, improved accessibility and vandalism, or greater weather exposure.

3.4.3.3 Project Impacts

This section analyzes impacts to historical resources (CRHR-eligible) identified within the proposed project. The cultural resources literature and records search for the proposed project indicated that 55 cultural resource studies have been conducted previously within a one-mile radius of the proposed project area. Of these, four studies included various portions of the project area. The records search also noted 44 previously documented cultural resources within a one-mile radius of the proposed project area. One of these resources, Rim of the World Drive (P-36-007049), was located within the proposed project area. Although no newly identified cultural resources were recorded during the pedestrian survey, the segment of the Rim of the World Drive that intersects the project area was documented and found to be eligible for listing on the CRHR. To date, no specific TCPs have been identified within the project area. Finally, information gathered from the cultural resource literature, records searches, and field surveys was also used to assess the potential for encountering previously unrecorded cultural resources within the project area; results of this assessment indicate that the Little Bear Creek portion of the project area exhibits a high potential for buried archaeological remains.

Criterion CR1: Cause a substantial adverse change in the significance of a historical or archaeological resource as defined by State of California guidelines.

Impact CUL-1: Construction, operation, and maintenance of the proposed project would demolish, destroy, relocate, or disturb the cultural resource in a manner that would diminish its integrity or materially impair the significance of the resource (Class II)

One CRHR-eligible cultural resource, Rim of the World Drive (P-36-007049), is located within the project area. However, the project proposes to trench under the historical resource. As such, the proposed project will not demolish, destroy, relocate, or disturb the features that contribute to the integrity of this resource. Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with project construction, particularly in the Little Bear Creek portion of the project area. Direct impacts to potentially significant cultural resources without mitigation would be a significant impact (Class I). The procedures and provisions in Mitigation Measure (MM) CUL-1a (Construction monitoring) and MM CUL-1b (Treatment of previously unidentified cultural resources), below, address inadvertent discoveries and provide detail on how these activities would be implemented to reduce impacts to a less-than-significant level (Class II).

Operation and maintenance of the proposed project would not result in any disturbance of cultural resources. In addition, indirect impacts to cultural resources are not anticipated for the project.

Mitigation Measures

MM CUL-1a Construction monitoring. Archaeological monitoring shall be conducted by a qualified archaeologist familiar with the types of prehistoric and historical resources that could be encountered within the project area. A monitor(s) shall be present for all ground disturbing activities that involve excavation within the Little Bear Creek portion of the project area. A monitoring program shall be developed and implemented by the County of San Bernardino, Department of Public Works or San Bernardino County Flood Control District (County) to ensure the effectiveness of monitoring.

A Native American monitor may be required at culturally sensitive locations specified by the County following project scoping with Native American tribes. The County shall retain and schedule any required Native American monitors.

MM CUL-1b Treatment of previously unidentified cultural resources. If previously unidentified cultural resources are unearthed during construction activities, construction work in the immediate area of the find shall be halted and directed away from the discovery until a qualified archaeologist assesses the significance of the resource. Once the find has been inspected and a preliminary assessment made, the County of San Bernardino, Department of Public Works or San Bernardino County Flood Control District will make the necessary plans for evaluation and treatment of the find(s).

Mitigation Measure CUL-1a (Construction Monitoring) shall also be implemented for Impact CUL-1b.

Criterion CR2: Disturb human remains, including those interred outside of formal cemeteries.

Impact CUL-2: Construction, operation, and maintenance of the proposed project could uncover, expose, and/or damage human remains (Class II)

No formal cemeteries or human remains are known to be located within the project area. However, there is always the possibility that unmarked burials may be unearthed during construction. The procedures and provisions in MM CUL-2 (Properly treat human remains), below, provides detail on how this activity would be implemented, in the unlikely event of an accidental discovery of any human remains, to reduce impacts to a less-than-significant level (Class II).

Mitigation Measure

MM CUL-2 Properly treat human remains. The County of San Bernardino, Department of Public Works or San Bernardino County Flood Control District (County) shall follow all State laws, statutes, and regulations that govern the treatment of human remains. Avoidance and protection of inadvertent discoveries which contain human remains shall be the preferred protection strategy with complete avoidance of impacts to such resources protected from direct project impacts by project redesign.

If human remains are unearthed during construction activities, construction work in the immediate area of the discovery shall be halted and directed away from the discovery until the county coroner can determine whether the remains are those of a Native American. If they are those of a Native American, the following would apply:

- a. The coroner shall contact the Native American Heritage Commission.
- b. If discovered human remains are determined to be Native American

remains, and are released by the coroner, these remains shall be left in situ and covered by fabric or other temporary barriers.

- c. The human remains shall be protected until the County, the landowner, and the Native American Heritage Commission come to a decision on the final disposition of the remains.
- d. According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and willful disturbance of human remains is a felony (Section 7052).

3.4.4 Level of Significance After Mitigation

Unknown buried resources (prehistoric and historical archaeological sites) could be inadvertently unearthed during ground-disturbing activities associated with project construction. Destruction of potentially significant cultural resources without mitigation would be a significant impact (Class I). However, implementation of MM CUL-1a (Construction monitoring) and MM CUL-1b (Treatment of previously unidentified cultural resources) would ensure that impacts to unanticipated archaeological discoveries are reduced to a less-than-significant level (Class II).

No human remains are known to be located within the project area. However, there is always the possibility that unmarked burials could be inadvertently unearthed during excavation activities, which could result in damage to these human remains. In the unlikely event of an accidental discovery of any human remains in a location other than a dedicated cemetery, MM CUL-2 (Properly treat human remains) would be implemented to reduce impacts to a less-than-significant level (Class II).

3.6 Hydrology and Water Quality

This section describes the potential effects on hydrology and water quality that would result from construction and operation of the proposed project. The following discussion addresses the existing environmental conditions in the project area, identifies and analyzes potential environmental impacts of the proposed project, and recommends measures to reduce or avoid significant impacts that are anticipated from project construction, operation, and maintenance. This section also describes existing laws and regulations that are relevant to hydrology and water quality. In some cases, compliance with these existing laws and regulations would reduce or prevent potential impacts that might otherwise occur with implementation of the proposed project.

3.6.1 Environmental Setting

The proposed project is located in the community of Rimforest, which sits within the southwestern portion of San Bernardino County on the crest of the San Bernardino Mountains. The project area is located within the administrative boundary of the San Bernardino National Forest and includes both forest and non-forest land. The community of Lake Arrowhead is located approximately 2 miles to the northeast, and the City of San Bernardino is located approximately 6 miles to the south-southwest. The proposed project is located within the Transverse Ranges geomorphic province, which is defined by a series of east-west trending mountain ranges in southwestern California that were formed partially due to movement along the San Andreas Fault (CGS, 2002). To the west of the San Bernardino Mountains, the Transverse Ranges geomorphic province also includes the San Gabriel Mountains and the Santa Ynez Mountains (CGS, 2002). The Antelope Valley and the Mojave Desert lie to the north. The Los Angeles basin, the San Jacinto Mountains, and the Colorado Desert lie to the south.

The topography of the project area is characterized primarily by the east-west trending crest of the San Bernardino Mountains. The community of Rimforest sits on a relatively flat bench that is located north of the crest of the San Bernardino Mountains and south-southeast of a ridge associated with Strawberry Peak (USGS, 2015). This bench sits at an elevation of approximately 5,650 feet above mean sea level (USGS, 2015). From this bench, a series of north to south trending ridges and valleys drop off sharply to the south. Severe erosion on this steep southern face has driven the need for development of the proposed project. Slopes to the north are substantially less steep. To the north and northwest, the project area is bound by a ridge associated with Strawberry Peak. To the northeast, the project area slopes slightly downhill towards Little Bear Creek (USGS, 2015). The headwaters of Strawberry Creek, which drains to the Santa Ana River and eventually to the Pacific Ocean, are located on the southern portion of the project area. The headwaters of Little Bear Creek, which drains to Lake Arrowhead, are located on the northern and eastern portions of the project area (USGS, 2015).

Climate in the project area is cooler and wetter than that of the Los Angeles basin to the south. Based on measurements from Lake Arrowhead (the nearest climate station), the summers are mild, with overall mean temperatures in the upper 60s degrees Fahrenheit, average maximum temperatures in the low 80s, and average minimum temperatures in the mid-50s (WRCC, 2015a). The winters are relatively cold, with overall mean temperatures in the upper 30s, average maximum temperatures in the mid- to upper 40s, and average minimum temperatures in the upper 20s (WRCC, 2015a). The average annual precipitation is approximately 40 inches (WRCC, 2015b). The majority of precipitation occurs from December through March. During these months, precipitation typically falls at least partially as snowfall. January is the wettest month, with a mean monthly precipitation total of 8.58 inches (WRCC, 2015b). In contrast, the

summer months are very dry; the mean total summer precipitation (for June, July, and August) is less than one inch (WRCC, 2015b).

3.6.1.1 Surface Water

Surface watersheds in California are divided into ten hydrologic regions, as defined by the California Department of Water Resources. The proposed project is located on the southwestern boundary of the South Lahontan Hydrologic Region (HR), a large drainage area bounded by the crests of the Sierra Nevada Mountains and the Transverse Ranges that includes the Antelope Valley and the Mojave Desert (CDF, 2004). The southwestern boundary of the South Lahontan HR is shared with the South Coast HR, which contains coastal watersheds in southern California that drain to the Pacific Ocean. Hydrologic Regions are subdivided into Hydrologic Units (HUs), and further into Hydrologic Areas (HAs) and Hydrologic Subareas (HSAs). Within the South Lahontan HR, the proposed project is located within the Mojave HU and the Upper Mojave HA (CDF, 2004). No HSA is defined for this area. Surface water in the Upper Mojave HA eventually drains to the Mojave River. The runoff that would be restored by the proposed project currently flows into Strawberry Creek, which is located within the South Coast HR, the Santa Ana River HU, the Upper Santa Ana River HA, and the Bunker Hill HSA (CDF, 2004). Surface water in the Bunker Hill HSA drains to the Santa Ana River and eventually to the Pacific Ocean.

The proposed project is located at the interface between undeveloped land with natural drainage features and urban development with altered drainage systems, such as underground stormwater systems. There are no named drainages within the project area, and runoff on undeveloped land typically occurs as sheet flow or ephemeral streams. Runoff on developed land either occurs as sheet flow or is intercepted by storm water drainage systems that discharge to the headwaters of Strawberry Creek. The headwaters of Strawberry Creek occupy the southern boundary of the project area. Several named waterbodies are located outside of, but near to, the project area. In addition to Strawberry Creek, the southern slopes of the San Bernardino Mountains are drained by East Twin Creek to the west of the project area and West Fork City Creek to the east of the project area (USGS, 2015). The northern slopes of the mountains are drained by Houston Creek and Dart Creek to the west of the project area and Grass Valley Creek, Little Bear Creek, Burnt Mill Creek, Fleming Creek, and Orchard Creek to the east of the project area (USGS, 2015). The headwaters of Little Bear Creek occupy the northeastern portion of the project area. Lake Arrowhead is located approximately 1.5 miles to the northeast, and Lake Gregory is located approximately 2.25 miles to the northwest (USGS, 2015). The very small Grass Valley Lake is located approximately 2 miles due north of the proposed project (USGS, 2015). For a description of jurisdictional waters that would be affected by the proposed project, please see Appendix 3, Preliminary Jurisdictional Delineation Report.

All of the project area is located within the South Lahontan HR, and the Lahontan Regional Water Quality Control Board (RWQCB) holds jurisdiction over this area (CDF, 2004). However, the runoff that would be restored by the proposed project currently flows into Strawberry Creek, which is located within the South Coast HR and is subject to the jurisdiction of the Santa Ana RWQCB (CDF, 2004). Based on a review of historic topographic maps, alluvial patterns, and aerial photos, it is likely that runoff in the project area flowed towards Little Bear Creek prior to substantial human alterations of the local topography and hydrology (Bonadiman, 2010; Hilltop, 2010). These alterations, including grading and drainage improvements for Highway 18 and the community of Rimforest, likely resulted in changes to the natural runoff pattern such that storm water in the project area now flows towards Strawberry Creek to the south rather than towards Little Bear Creek to the northeast (Bonadiman, 2010; Hilltop, 2010). However, the historic topographic maps do not contain sufficient detail to assess historic runoff patterns with certainty. It is probable but not certain that the actions of the proposed project would direct runoff in the project area towards its historic, natural outlet. Nonetheless, this restoration of the flowpath could require the approval of the State Water

Resources Control Board (SWRCB). The restoration of the historical flow path may also require the approval of the San Bernardino Valley Municipal Water District (SBVMWD), which holds water rights to this drainage area (Bonadiman, 2010).

As described above, the proposed project would be subject to the rules and regulations of two RWQCBs, the Lahontan RWQCB and the Santa Ana RWQCB. Each of these regional boards sets forth rules and regulations in a water quality control plan, also known as a basin plan. These basin plans identify beneficial uses for surface water and groundwater and establish water quality objectives to attain those beneficial uses. The identified beneficial uses and the water quality objectives to maintain or achieve those uses are together known as water quality standards. The LRWQCB Basin Plan governs water quality for the project area and identifies beneficial uses for Houston Creek, Little Bear Creek, Lake Arrowhead, minor surface waters, and minor wetlands (LRWQCB, 2005). The SARWQCB Basin Plan identifies beneficial uses for Strawberry Creek, which would be affected by the storm water diversions that comprise the proposed project (SARWQCB, 2008). Table 3.6-1 below presents the beneficial uses for surface waters within the project area.

Table 3.6-1. Basin Plan Beneficial Uses

Basin Plan	Waterbody	Beneficial Uses
SARWQCB Basin Plan	Strawberry Creek	Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Spawning, Reproduction and Development (SPWN)
LRWQCB Basin Plan	Houston Creek ¹	MUN, AGR, REC1, REC2, Commercial and Sportfishing (COMM), COLD, WILD
	Little Bear Creek	MUN, AGR, REC1, REC2, COMM, COLD, WILD
	Lake Arrowhead	MUN, AGR, GWR, Navigation (NAV), REC1, REC2, COMM, COLD, WILD
	Minor Surface Waters	MUN, AGR, GWR, Hydropower Generation (POW), REC1, REC2, WARM, COLD, WILD
	Minor Wetlands	MUN, AGR, GWR, Freshwater Replenishment (FRSH), REC1, REC2, WARM, COLD, WILD, Rare, Threatened, or Endangered Species (RARE), Water Quality Enhancement (WQE), Flood Peak Attenuation/Flood Water Storage (FLD)

¹ – Houston Creek is outside of the drainage area of the proposed project but is included here because any groundwater that would be produced by dewatering activities is proposed to be discharged to Houston Creek.

Source: (LRWQCB, 2005; SARWQCB, 2008)

The Clean Water Act 303(d) list is a register of impaired and threatened waters which the CWA requires all states to submit for EPA approval. The list identifies all waters where the required pollution control measures have so far been unsuccessful in reaching or maintaining the required water quality standards. Waters that are listed are known as “impaired.” There are no impaired waterbodies within or near the project area (SWRCB, 2010). The nearest impaired waterbody is Sheep Creek, which is a tributary to Deep Creek and is located approximately 4.6 miles east of the proposed project. Sheep Creek is listed as impaired by nitrate and total dissolved solids (SWRCB, 2010). The proposed project would not direct any runoff towards Sheep Creek. Sheep Creek is tributary to Deep Creek, as is Little Bear Creek (downstream of Lake Arrowhead). The proposed project would restore runoff into Little Bear Creek, which would eventually drain to Deep Creek. However, Deep Creek is not listed as impaired.

Areas that are subject to a risk of flooding from a 100-year flood event are identified by the Federal Emergency Management (FEMA) on the National Flood Hazard Layer (NFHL). There are no 100-year flood hazard zones within the project area (FEMA, 2015). However, both Little Bear Creek and Lake Arrowhead are within a 100-year flood hazard area designated as Zone A on the NFHL (FEMA, 2015). The proposed project would contribute additional runoff to Little Bear Creek, which drains to Lake Arrowhead.

3.6.1.2 Groundwater

The proposed project is not underlain by any groundwater basins. However, as shown above in Table 3.6-1, several of the waterbodies that would be affected by the proposed project have groundwater recharge as a designated beneficial use. Also, shallow groundwater occurs within the project area in zones of fractured granitic bedrock and in areas where the rock is highly weathered (Hilltop, 2010). Runoff that currently flows to Strawberry Creek recharges the Bunker Hill Subbasin of the Upper Santa Ana Valley Groundwater Basin (DWR, 2004a). Runoff that would be redirected towards Little Bear Creek would eventually join the Mojave River via Deep Creek and recharge the Upper Mojave River Valley Groundwater Basin (DWR, 2004b).

Bunker Hill Subbasin of the Upper Santa Ana Valley Groundwater Basin

The Bunker Hill Subbasin contains alluvial material that underlies roughly 120 square miles of the San Bernardino Valley and is bounded by the San Gabriel Mountains, the San Bernardino Mountains, the Crafton Hills, and several faults, including the San Andreas and San Jacinto faults (DWR, 2004a). Annual precipitation across the basin ranges from 13 to 31 inches (DWR, 2004a). The Subbasin is divided into upper and lower aquifers by a semi-permeable layer of clay. The Santa Ana River, Mill Creek, and Lytle Creek are the primary sources of recharge to the Subbasin (DWR, 2004a). Many of the creeks that flow down from the southern slopes of the San Bernardino Mountains (including Strawberry Creek) also contribute runoff that recharges the Subbasin (DWR, 2004a). The total groundwater storage capacity is estimated at 5,976,000 acre feet, and the total amount of water in storage in was last estimated at 5,890,300 in 1998 (DWR, 2004a). The Subbasin is managed by the San Bernardino Valley Water Conservation District, which controls groundwater levels so that they do not rise to the ground surface in downtown San Bernardino (DWR, 2004a). Several wells in the basin that were sampled between 1994 and 2000 showed contamination above Maximum Contaminant Levels (MCLs) for inorganics, radioactivity, nitrates, pesticides, volatile organic compounds, and semi-volatile organic compound (DWR, 2004a).

Upper Mojave River Valley Groundwater Basin

The Upper Mojave River Valley Groundwater Basin contains a generally unconfined aquifer formed in mostly younger alluvium that is bound on the south by the San Bernardino Mountains, on the north by basement rock outcrops between Helendale and the Shadow Mountains, on the east by the Helendale fault and the mountains surrounding Apple Valley, and on the west by a surface drainage divide and the Shadow Mountains (DWR, 2004b). The surface area of the Basin is roughly 645 square miles (DWR, 2004b). Annual precipitation across the basin ranges from 5 to 36 inches and averages 12 inches (DWR, 2004b). Direct precipitation, ephemeral stream flow, subsurface flow from the southwest, and intermittent flow from the Mojave River are the primary sources of recharge to the basin (DWR, 2004b). Groundwater levels in the Basin have generally declined over the last 60 years, but fluctuate in response to rainfall and runoff (DWR, 2004b). The storage capacity of the Basin is not well known, but the range has been estimated at 13,000,000 acre feet to approximately 28,000,000 acre feet (DWR, 2004b). The amount of groundwater currently in storage is also not well known, but was estimated at approximately 10,800,000 acre feet in 1998 (DWR, 2004b). Several wells in the basin that were sampled between 1994 and 2000 showed contamination above Maximum Contaminant Levels (MCLs) for inorganics, radioactivity, and nitrates (DWR, 2004b).

3.6.2 Applicable Regulations, Plans, and Standards

The project would involve the disturbance of more than one acre of land, most of which is in an existing stream bed, and would be subject to compliance with the regulations outlined in this section.

3.6.2.1 Federal

Clean Water Act

The Clean Water Act (CWA) (33 U.S.C. Section 1251 et seq., formerly the Federal Water Pollution Control Act of 1972) was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). NPDES permitting authority is administered by the California State Water Resources Control Board (SWRCB) and its' nine Regional Water Quality Control Boards (RWQCB). The proposed project is within areas administered by the Lahontan RWQCB, and would restore storm water that currently flows into the South Coast HR, which is administered by the Santa Ana RWQCB.

The proposed project would be required to obtain NPDES coverage under the California General Permit for Discharges of Storm Water Associated with Construction Activity. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) describing Best Management Practices (BMPs) the discharger would use to prevent and retain stormwater runoff. The SWPPP must contain a visual monitoring program and a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs. The proposed project would also be required to obtain NPDES coverage under the General Permit for Limited Threat Discharges to Surface Waters (NPDES No. CAG996001) before discharging any dewatered shallow groundwater to Houston Creek. Compliance with this permit would ensure that any discharges would not result in a threat to water quality or beneficial uses of water.

Section 401 of the CWA requires that any activity, including river or stream crossings during road or pipeline construction, which may result in a discharge into waters of the U.S. be certified, in the case of this project, by the SWRCB. This certification ensures that the proposed activity does not violate State and/or federal water quality standards. The proposed project could result in discharges to waters of the U.S., and would likely require Section 401 certification.

Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (USACE) to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. Discharges to waters of the U.S. must be avoided where possible, and minimized and mitigated where avoidance is not possible. The proposed project would discharge storm water to Little Bear Creek, which is a federally jurisdictional stream.

Section 303(d) of the Clean Water Act requires states to establish Total Maximum Daily Load (TMDL) programs for streams, lakes and coastal waters that do not meet certain water quality standards. There are no 303(d) listed waterbodies within or near the project area.

National Flood Insurance Act/Flood Disaster Protection Act

The National Flood Insurance Act of 1968 made flood insurance available for the first time. The Flood Disaster Protection Act of 1973 made the purchase of flood insurance mandatory for the protection of property located in Special Flood Hazard Areas. These laws are relevant because they led to mapping of regulatory floodplains and to local management of floodplain areas according to guidelines which include

prohibiting or restricting development in flood hazard zones. Although the proposed project is not located within a flood hazard zone, the redirection of storm water to Little Bear Creek could potentially alter downstream flood hazard zones associated with Little Bear Creek and Lake Arrowhead.

3.6.2.2 State

California Porter Cologne Water Quality Control Act

The Porter Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the SWRCB and the nine RWQCBs to adopt water quality criteria to protect State waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. The criteria for the project area are contained in the Water Quality Control Plan for the Santa Ana River Basin (SARWQCB, 2008) and the Water Quality Control Plan for the Lahontan Region (LRWQCB, 2005). Constraints in the water quality control plans relative to the proposed Project relate primarily to the avoidance of altering the sediment discharge rate of surface waters, and the avoidance of introducing toxic pollutants to water resources. A primary focus of water quality control plans is to protect designated beneficial uses of waters. In addition, anyone proposing to discharge waste that could affect the quality of the waters of the state must make a report of the waste discharge to the Regional Water Board or State Water Board as appropriate, in compliance with Porter-Cologne.

California Streambed Alteration Agreement

Sections 1600–1616 of the California Fish and Game Code requires that any public utility (or other entity) that proposes an activity that would substantially divert or obstruct the natural flow of any river, stream or lake; substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or, deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake, must notify the California Department of Fish and Wildlife (CDFW). If the CDFW determines the alteration may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement would be prepared. The Agreement includes conditions necessary to protect those resources. The Agreement applies to any stream including ephemeral streams and desert washes.

California Water Code §§1735-1737

The State Water Resources Control Board requires a petition for an appropriative water right for diversion of water for beneficial use in the Mojave River Watershed. Because the runoff that would be restored to its original flowpath by the proposed project is claimed by water rights held by the San Bernardino Municipal Water District (SBVMWD), the SBVMWD may need to petition the SWRCB for a long-term transfer of water to the Lake Arrowhead Community Services District (LACSD), which is the water supplier for the Lake Arrowhead reservoir that would receive the restored runoff. The need for a petition for a long-term transfer of water or water rights will be determined by the SWRCB prior to the commencement of construction activities.

California Water Code §13260

California Water Code §13260 requires that any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the State, other than into a community sewer system, must submit a report of waste discharge to the applicable Regional Board. Any actions related to the proposed action that would be applicable to California Water Code §13260 would be reported to the Lahontan RWQCB.

Other State Requirements

Water diversion and/or dewatering activities may be subject to discharge and monitoring requirements under either NPDES General Permit, Limited Threat Discharges to Surface Waters, Board Order R6T-2014-0049, or General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality, WQ0-2003-0003, both issued by the Lahontan Regional Water Quality Control Board.

3.6.2.3 Local

San Bernardino County Floodplain and Stormwater Management

The San Bernardino County Flood Control District controls runoff and flooding associated with all main streams and acquires a ROW for all main channels. An encroachment permit would not be required for any work within the District's ROW because the District is a participant in the proposed project. The proposed project may qualify as a Non-Category Project that creates a Hydrologic Condition of Concern (HCOC) and may be required to develop and implement a Water Quality Management Plan (WQMP) that includes Best Management Practices to minimize the impact from identified HCOCs.

County of San Bernardino General Plan

The County of San Bernardino 2007 General Plan contains goals and policies to maintain, protect, and improve water quality throughout the County. Applicable goals and policies are contained in the Circulation and Infrastructure Element, the Conservation Element, and the Safety Element. The General Plan includes goals and policies to minimize impacts to stormwater quality; ensure that infrastructure improvements are compatible with the natural environment of the region; protect and preserve water resources for the maintenance, enhancement, and restoration of environmental resources; minimize damage due to wind and water erosion; and provide adequate flood protection to minimize hazards and structural damage.

3.6.3 Environmental Impacts and Mitigation Measures

This section describes environmental impacts of the proposed project relevant to hydrology and water quality. The impact analysis is based on an assessment of baseline conditions relevant to the proposed project area climate, topography, watersheds and surface waters, groundwater, and floodplains, as described in Section 3.6.1. These baseline conditions were evaluated based on their potential to be affected by construction activities as well as operation and maintenance activities related to the proposed project.

Potential impacts were then identified based on the predicted interaction between construction, operation, and maintenance activities with the affected environment. Impacts are described in terms of location, context, and intensity, and are identified as being either short- or long-term, and direct or indirect in nature. Beneficial as well as adverse impacts are identified, with a discussion of the effect and risk to water quality and public health and safety, and potential violation of environmental laws. Mitigation measures are developed to avoid or minimize impacts.

In addition to the mitigation measures that are developed to avoid or minimize impacts, the County has incorporated Environmental Commitments (ECs) into the proposed project that would minimize potential environmental adverse effects. ECs related to hydrology and water quality include the preparation of a Water Quality Management Plan (WQMP) and a Stormwater Pollution Prevention Plan (SWPPP) to identify site design, pollution source control, and Best Management Practices (BMPs) to prevent water quality degradation. The County will also perform a preliminary drainage study to analyze potential 100-

year flood impacts at Lake Arrowhead that would result from the restoration of storm water runoff to Little Bear Creek.

3.6.3.1 Significance Criteria

To satisfy CEQA requirements, conclusions are made regarding the significance of each identified impact that would result from the proposed project. Appropriate criteria have been identified and utilized to make these significance conclusions based on the CEQA Appendix G Environmental Checklist, and relevance to this analysis based on local conditions and the project description.

Not all of the standard Appendix G criteria are applicable to the proposed project. The project does not involve the construction of housing, and is not near the coast or a lake where there could be a tsunami or seiche hazard. In the context of the proposed project, several of the CEQA criteria overlap, and in this analysis they are combined. For purposes of this analysis, the proposed project would result in significant impacts to hydrology and water quality if it would:

- *Criterion HWQ1: Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality*
- *Criterion HWQ2: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)*
- *Criterion HWQ3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion, siltation, or mudflow on- or off-site, or would provide substantial additional sources of polluted runoff*
- *Criterion HWQ4: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, or would exceed the capacity of existing or planned stormwater drainage systems*

The following thresholds from CEQA Appendix G Environmental Checklist were found to have no impact or a less than significant impact in the Initial Study and are not discussed further beyond the summary below:

- *C.3.9 (g) Place housing within a 100 year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other hazard delineation map?*
- *C.3.9 (h) Place within 100 year flood hazard area structures that would impede or redirect flood flows?*
- *C.3.9 (i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.*

The proposed project does not include the construction of any housing, and would not place housing within a 100-year floodplain as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map; no impact would occur. The proposed project would not involve the construction of any structures within a 100-year floodplain that would impede or redirect flood flows; no impact would occur. As discussed under the criterion for on- or off-site flooding due to the alteration of the existing drainage pattern, it is possible that implementation of the project could result in increased flooding; however, project design features and mitigation measures would be implemented to avoid

increased flooding and associated adverse impacts, including the potential to expose people or structures to a risk of loss, injury, or death. There are no levees or dams in the vicinity of the project that could experience failure and cause flooding as a result of the project. The nearest dam to the project site is the Lake Arrowhead Dam, located more than four miles (linear) to the northeast and downstream of Rimforest. No impact would occur due to the failure of a levee or dam.

3.6.3.2 Project Impacts

This section describes the direct and indirect impacts of the proposed project. Cumulative impacts are discussed separately in Section 5 (Cumulative Effects).

Criterion HWQ1: Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality

Impact HYD-1: Construction, operation, and maintenance of the proposed project would degrade water quality and violate water quality standards or waste discharge requirements (Class II)

The project has the potential to exceed water quality standards described in the RWQCB Lahontan Region basin plan, including those related to chemical constituents, color, dissolved oxygen, floating materials, oil and grease, nondegradation of aquatic communities, pesticides, pH, sediment, suspended materials, taste and odor, temperature, toxicity, and turbidity. The beneficial uses described in Table 3.6-1 for the Lahontan Region could be affected. Water quality impacts could result from project construction activities, project operation and maintenance, alteration of hydrologic characteristics, or alteration of channel characteristics. The processes that could lead to exceedance of water quality standards and degradation of beneficial uses are described in the paragraphs below.

Construction of the proposed project would result in the temporary disturbance of approximately 10.03 acres and the permanent disturbance of approximately 6.24 acres. Ground disturbance activities associated with construction of the proposed project include excavation and trenching to install the storm water culvert and appurtenances and the channelized reaches, and excavation of the attenuation basin(s) to provide up to 20 acre feet of storage capacity. These ground disturbance activities could loosen and destabilize soils. These loose and destabilized soils could be mobilized during a subsequent storm event and could result in increased turbidity and sediment deposition in nearby waterbodies. The potential for loosened soil to be transported to a nearby waterbody would be minimized by the project schedule, which would limit construction activities to the non-rainy season. Potential increases in erosion and sedimentation would be further reduced by project ECs and applicable regulations that would require development and implementation of a WQMP and a SWPPP, which would include BMPs to prevent and control erosion and sedimentation.

Construction of the proposed project would involve the use of heavy equipment and machinery. Use of this construction equipment would involve the handling, use, and storage of hazardous materials, such as diesel fuel, gasoline, lubrication oil, cement slurry, hydraulic fluid, antifreeze, transmission fluid, and lubricating grease. Accidental releases or spills of hazardous materials used during construction could result in the direct contamination of waterbodies within the project area or the indirect contamination of nearby waterbodies through subsequent transport by stormwater runoff. The potential for the accidental release or spill of a hazardous material to contaminate surface water or groundwater within or near the project area would be relatively low due to the ephemeral or intermittent nature of most streams in the project area and the fact that construction activities would be limited to the non-rainy season. Also, the quantity of hazardous materials that would be handled, used, and stored during construction of the

proposed project would be small enough such that an accidental release or spill could be quickly contained and removed for safe disposal. The potential for the accidental release or spill of a hazardous material to contaminate a nearby waterbody would be further reduced through implementation of the required SWPPP, which would include BMPs to quickly and effectively contain and clean-up hazardous material leaks and spills.

Construction of the proposed project, including excavation and trenching, may encounter shallow groundwater. In the event that shallow groundwater is encountered, dewatering of the excavation or trenching site may be required. If improperly managed, these dewatering activities could result in the discharge of contaminated groundwater. Groundwater that is pumped from a subsurface construction site would be temporarily stored and tested prior to discharge. Contaminated groundwater would be treated prior to discharge or disposed of at an appropriate disposal facility or wastewater treatment plant. Prior to the discharge of any uncontaminated groundwater, the County would obtain all required permits (such as a General Permit for Limited Threat Discharges to Surface Waters, Waste Discharge Requirements application, or Conditional Waiver) from the applicable RWQCB.

Compliance with applicable laws and regulations and implementation of BMPs to protect water quality would ensure that construction of the proposed project would not substantially degrade water quality, or violate water quality standards or waste discharge requirements. BMPs typically used to protect water quality include sediment controls, waste management and material controls, non-storm water discharge controls, erosion control, soil stabilization, and minimization of vegetation removal. Specific BMPs would be developed as part of the compliance process. Compliance with the regulations described in Section 3.6.2 is intended to prevent exceedance of water quality standards and degradation of beneficial uses. This impact during construction would therefore be less than significant and no mitigation is required.

Operation and maintenance (O&M) activities would be substantially less intense than construction activities. O&M activities would generally include slope stabilization, where necessary to maintain the integrity of flood conveyance facilities; removal of sediment and vegetation from the attenuation basin(s) and channelized sections and catch basins to maintain capacity; regular inspection of facilities for wear and damage; repair of facilities as needed; and, maintenance of vegetated landscape buffers. These activities would result in a minor to moderate amount of ground disturbance. The greatest amount of ground disturbance during O&M would likely be associated with removal of sediment from the attenuation basin(s). This sediment would be removed during the non-rainy season, unless otherwise required for emergency repairs. Also, depending on the design of the attenuation basin(s) and outlet structure, most of the erosion that would occur during operation of the proposed project would be captured by the attenuation basin(s) and would not be transported downstream to Little Bear Creek.

Inspection activities during O&M would involve the use of light-duty vehicles. Heavy construction equipment would be required for sediment removal from the attenuation basin(s) and channelized sections. The use of these vehicles and equipment would require the use of hazardous materials, such as fuel, lubricants, and coolant. These hazardous materials could contaminate waterbodies in the project area through an accidental release or spill. The use of vehicles and construction equipment during O&M for the proposed project would be substantially less than during construction, and therefore the risk of contamination of a nearby waterbody from the accidental release or spill of a hazardous material would be proportionally lower. Dewatering activities during O&M are not anticipated. This impact to beneficial uses during operations and maintenance would be less than significant and no mitigation is required.

The attenuation basin and surrounding project features would be built in the headwaters of Little Bear Creek and would represent a permanent disturbance to that area. Local beneficial uses related to

recreation and habitat (REC1, REC2, COLD, WILD) could be locally impacted by the removal of vegetation and the change in configuration of the watercourse.

Because of the change in watershed area draining to Little Bear Creek, the hydrologic characteristics of Little Bear Creek downstream of the attenuation basin would be changed. Flood and runoff volumes in the Strawberry Creek watershed would be decreased an average of 47 acre feet per year, as measured at the 5631-Acre East Twin Creek watershed, which includes Strawberry Creek runoff, by the reduction of about 77 acres of watershed area (Bonadiman, 2010). Little Bear Creek runoff would be increased by a proportional amount. The project would not involve the addition of large impervious areas, so runoff frequency (how many events occur in a year) would be approximately similar to the existing condition. Although the 100-year peak discharge would be attenuated to a discharge that is at or below the existing discharge by the attenuation basin, there is a potential, depending on basin configuration and outlet conditions, for more frequent discharges, such as the 2-year return-period flood, to be higher than for existing conditions. The detention basin further has the potential for causing incoming sediments to settle, depriving the downstream channel of sediment. These effects could cause increased flood potential for discharges less than the 100-year, as well as water quality impacts related to downstream erosion and channel modification, potentially affecting beneficial uses of Little Bear Creek, that could result from increased frequent floods and the reduction in sediment supply.

Mitigation Measure HYD-1 would ensure that sediments transported by frequent floods, which can have a large effect on channel morphology by their frequency, be transported through the basin without settling. The mitigation measure also requires that the basin configuration and outlet be so designed as to attenuate all flood peaks up to the 100-year to approximate the current condition to the maximum extent possible. By allowing pass-through low flow sediment transport, and minimum alteration of flood peaks, these measures would minimize the potential for channel modification and degradation of beneficial uses of Little Bear Creek downstream of the attenuation basin. Mitigation Measure HYD-1 also requires that the basin be no larger than the minimum necessary to achieve the design purpose, to avoid excessive disturbance of the riparian area. With implementation of Mitigation Measure HYD-1, Impact HYD-1 would be less than significant (Class II).

The hydrologic characteristics of Strawberry Creek would be changed by directing 77 acres of the upper Strawberry Creek watershed to Little Bear Creek. Figure 3.6-1 shows the watershed configuration and the area to be routed from Strawberry Creek to Little Bear Creek. The effect would be a 77-acre reduction in Strawberry Creek watershed area, and the loss of about 47 acre feet of runoff to the watershed each year, as described above. This could have an adverse effect on beneficial uses through the reduction in flow.

An independent evaluation of the likely effect on Strawberry Creek flows was made using U.S.G.S. stream gage data (USGS, 2015) for representative small, gaged streams in the surrounding area. Representative streams included Abondigas Creek, Little Bear Creek, Grass Valley Creek, Waterman Canyon, Devil Canyon, Willow Creek, East Twin Creek, and the East Fork Mojave River, ranging from 1.15 square miles in watershed area (Abondigas Creek) to 11.2 square miles (East Fork Mojave River). Average daily runoff, averaged over the period of one year, was determined from USGS-reported monthly runoff totals for the periods represented by the gages. The gage data revealed an average daily runoff rate ranging from 1.3 cfs/square-mile for Little Bear Creek, to 0.5 cfs/square mile for the East Fork Mojave River, with the runoff rate per watershed square mile decreasing with increasing watershed area. The runoff rate per square mile could be approximated by a logarithmic trend line. This relationship was applied to the Strawberry Creek watershed as indicated in Table 3.6.2.

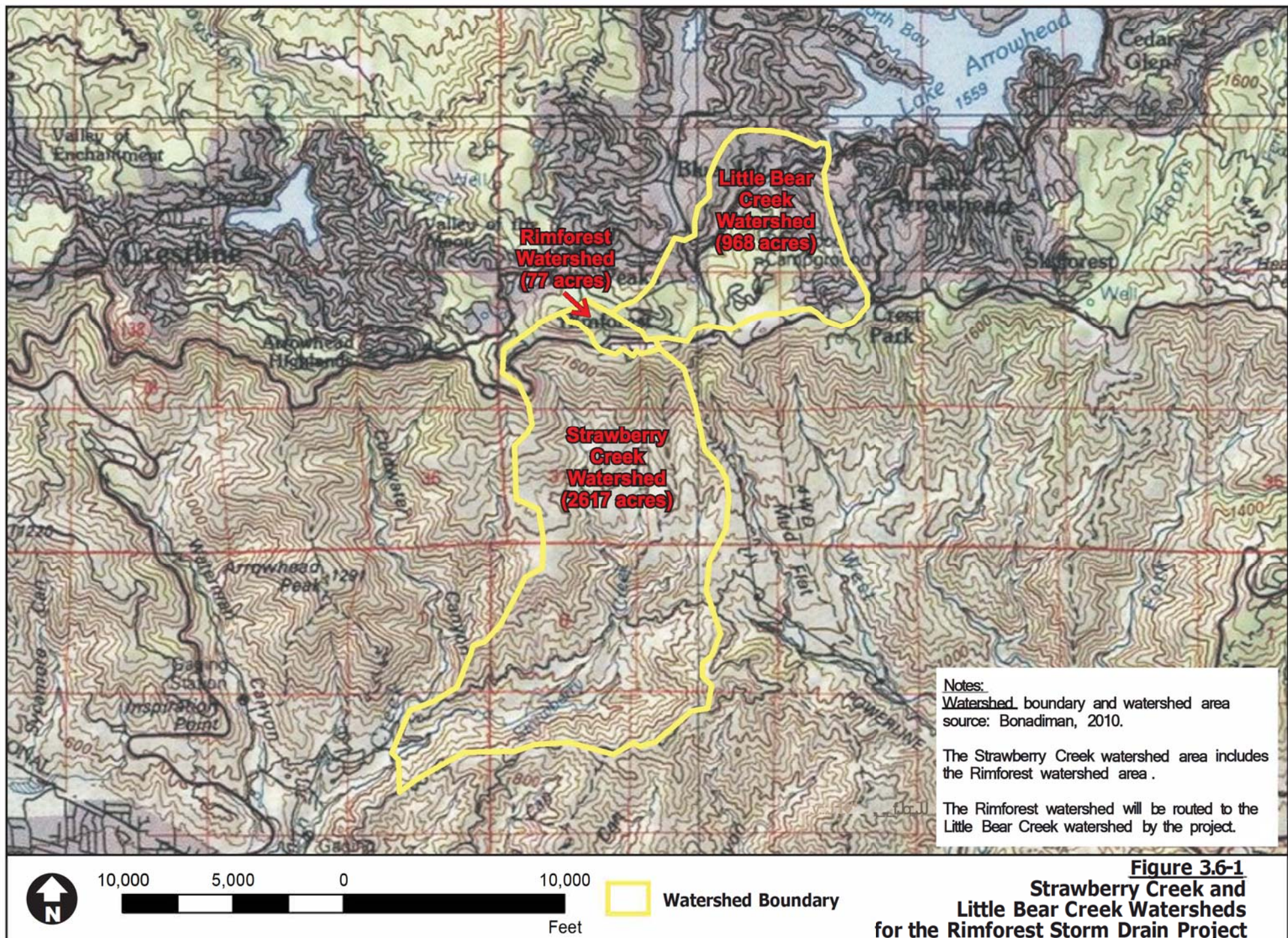


Table 3.6-2. Strawberry Creek Representative Estimated Average Daily Flows

Watershed Area, in Square Miles		Average Daily Discharge, in cfs	
Existing Conditions	With Project Conditions	Existing Conditions	With Project Conditions
1.00	0.88	1.29	1.17
2.00	1.88	2.06	1.98
3.00	2.88	2.64	2.58
4.00	3.88	3.10	3.05
4.40 (Confluence with East Twin Creek)	4.28 (Confluence with East Twin Creek)	3.26 (Confluence with East Twin Creek)	3.21 (Confluence with East Twin Creek)

Note: Average daily flows are approximated from available stream gage data from nearby watersheds of similar size and in similar terrain. The watershed areas for existing conditions are arbitrary and intended to provide information on likely average daily flow at various points along the Strawberry Creek stream channel.

Table 3.6-2 gives approximate Strawberry Creek average daily flows at various points along the stream channel defined by watershed area at one-square-mile intervals to the confluence with East Twin Creek. Expected average daily flows range from 1.29 cfs at the one-square-mile point, to 3.26 cfs at the confluence, for existing conditions. Probable flows after removal of the upper 77 acres of the watershed range from 1.17 cfs to 3.21 cfs. This amounts to a 1% to 9% reduction in stream flow, depending on distance from the upper watershed.

Table 3.6-3 gives a representation of how the reduction in discharge might be manifested in surface flow characteristics based on a standardized stream cross section intended to represent general conditions on Strawberry Creek. The greatest change in depth from existing to with-project conditions would be a 0.9-inch reduction (about 3% of the depth) at the one-mile point. Flow top width at the same point would be reduced by about 4%. Downstream of that point the change would be about 1% or less for depth and top width.

Table 3.6-3. Strawberry Creek Representative Estimated Average Daily Flow Depths and Top Widths

Existing Conditions			With Project Conditions		
Watershed Area, in Square Miles	Flow Depth, in Inches	Flow Top Width, in Feet	Watershed Area, in Square Miles	Flow Depth, in Inches	Flow Top Width, in Feet
1.00	2.74	0.92	1.29	2.65	0.88
2.00	3.27	1.09	2.06	3.23	1.08
3.00	3.59	1.20	2.64	3.56	1.19
4.00	3.82	1.27	3.10	3.79	1.26
4.40 (Confluence with East Twin Creek)	3.89	1.30	3.26 (Confluence with East Twin Creek)	3.87	1.29

Note: Depths and Top Widths are derived using the normal depth equation with discharges from Table 3.6-2. Representative cross section is: Bottom width: 0; Side Slopes: 2:1; Channel Slope: 0.12; Roughness Coefficient: 0.07. The data in this table are for the determination of the magnitude of likely impacts only, and are not intended to be used or interpreted for any other purpose.

From the upper watershed boundary to a point about one mile downstream (roughly the one-mile watershed area point), the Strawberry Creek channel appears to have been heavily impacted by the erosion caused by the discharge of Rimforest Flows over the steep slope just south of Rimforest and at the headwater of Strawberry Creek. The upper eroded area is steep-slope bare earth approximately nine

acres in area. Rock and dislodged earth from this area appear to have been deposited in the Strawberry Creek channel for about the first mile of channel. This is clearly visible in aerial photographs, and it appears that this channel is in a degraded ecological condition due to this deposition. The project, which would remove the source of water that is causing this erosion and deposition-related channel degradation, would likely result in a beneficial impact for this channel by allowing that portion of the channel to return to a more-natural hydrology and ecological function appropriate for a channel of this type at the upper reaches of the watershed. Downstream of the one-mile point, the project would have negligible and likely imperceptible effect on stream flows as indicated in the analysis summarized in Tables 3.6-2 and 3.6-3. For the reasons described above, the beneficial uses of Strawberry Creek would either be not significantly affected, or would be benefitted, by the project.

The overall effect of the project on the beneficial uses described in Table 3.6.1 would be beneficial to the upper mile of the Strawberry Creek watershed by eliminating a significant source of erosion and sediment that is currently affecting this area. Adverse impact on Strawberry Creek would be adverse, but not significant, for the reasons described in the analysis above. Impacts to beneficial uses on Little Bear Creek would be local and limited to the upper headwater and mitigated by MM BIO-1a (Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas, MM BIO-1b (Pre-construction Surveys and Construction Monitoring), MM BIO-1c (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), and MM BIO-1d (Prevent Invasive Weed Introduction). Downstream of the headwater, impacts would be mitigated by MM HYD-1),

Mitigation Measure

MM HYD-1 Attenuation basin to be no larger than necessary and designed to mimic downstream hydrology and sediment transport. The attenuation basin shall include a low-flow channel designed to pass the average annual (about a 2-year return period) flows for existing conditions, unimpeded through the basin and outlet, to allow normal transport of sediments transported by frequent runoff events through the basin and into the downstream channel.

The attenuation basin and outlet shall be no larger than the minimum necessary to achieve the design purpose, and be designed to ensure that downstream peak flow rates for all flood return periods up to the 100-year be as close as possible to the existing conditions peak flow rates in Little Bear Creek at the attenuation basin outlet.

Criterion HWQ2: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)

Impact HYD-2: Construction and operation of the proposed project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge (Class III)

Construction of the proposed project would require a small amount of water for soil compaction, dust suppression, equipment wash down, concrete placement preparation, and potentially for concrete production. This water would be obtained from fire hydrants located within the community of Rimforest. Between 1989 and 2014, the community of Rimforest received its water supply from the City of Big Bear Lake Department of Water and Power (Big Bear Lake DWP). On October 1, 2014, water supply services for the community of Rimforest were transferred to the Lake Arrowhead Community Services District (LACSD), which is the current water supplier for the community (Big Bear Lake DWP, 2014). The LACSD

sources its water supply from surface water impounded in Lake Arrowhead, a small amount of groundwater extracted from fractured bedrock, and State Water Project (SWP) water purchased from the SBVMWD and delivered through the Crestline-Lake Arrowhead Water Agency (LACSD, 2015). Construction water use for the proposed project would not directly result in the extraction of groundwater or the depletion of groundwater resources. Because construction water would be provided by the LACSD, which sources a small portion of its water from groundwater, construction of the proposed project could indirectly lead to the extraction of groundwater. However, construction water use for the proposed project would be temporary and would represent a small percentage of total LACSD deliveries. Construction water use would not indirectly deplete groundwater supplies such that the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted.

Although some shallow groundwater may be encountered in the project area, the proposed project is not underlain by a DWR-identified groundwater basin. A small amount of dewatering may be required during construction of the proposed project, but these dewatering activities would be temporary and would not adversely affect the production of a nearby well or substantially deplete groundwater supplies. Neither construction nor operation of the proposed project would substantially interfere with groundwater recharge; impervious surfaces would be small and distributed throughout the watershed. Sufficient permeable surfaces would remain throughout the watershed such that the rate of groundwater recharge would remain unchanged as a result of construction and operation of the proposed project. Additionally, the attenuation basins that would be constructed as part of the proposed project may allow for increased groundwater recharge compared to baseline conditions.

Although construction and operation of the proposed project would not result in the direct extraction of groundwater or substantially interfere with groundwater recharge, the proposed project would restore approximately 47 acre feet of runoff per year from Strawberry Creek to Little Bear Creek as measured at the 5631-Acre East Twin Creek watershed, which includes Strawberry Creek runoff. This diversion would alter the amount of water available for recharge in both the Upper Santa Ana Valley Groundwater Basin (Santa Ana Basin) and the Upper Mojave River Valley Groundwater Basin (Mojave Basin). The amount of water available for recharge to the Mojave Basin would increase by approximately 47 acre feet per year, and would decrease by the same amount for the Santa Ana Basin (MBA, 2010). The proportion of the additional 47 acre feet entering the Mojave Basin annually that would actually infiltrate into the groundwater basin would depend on climate and water management at Lake Arrowhead. Based on information from DWR, the Santa Ana Basin has a greater percentage of its storage capacity filled than the Mojave Basin, and diversion of 47 acre feet of runoff from the Santa Ana Basin to the Mojave Basin represents an annual reduction of approximately 2% (47 acre feet per year) to the Santa Ana Basin (Bonadiman, 2010), which would not substantially deplete groundwater supplies, especially when the total volume of the Bunker Hill Subbasin of the Upper Santa Ana Valley groundwater basin, 5,890,300 acre feet, is considered. Nonetheless, this diversion may require a water rights transfer petition to the SWRCB. The SWRCB will determine the need for a water rights transfer petition prior to the commencement of construction activities.

Local groundwater in the Strawberry Creek watershed, in areas not underlain by usable groundwater basins, would potentially be decreased by amounts proportional to the discharges given in Table 3.6-2. Water available for groundwater recharge would decrease by approximately 9% at the one-mile-area watershed point, 4% at the 2-mile-area watershed point, and 2% at the 3-mile-area watershed point. Although this represents a slight reduction in water availability, surface flow is still expected to be present, meaning local groundwater content is likely to be reduced less, if at all.

For the reasons given above, this impact would be less than significant, and no mitigation measures are required (Class III).

Criterion HWQ3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion, siltation, or mudflow on- or off-site, or would provide substantial additional sources of polluted runoff

Impact HYD-3: Construction and operation of the proposed project would result in substantial erosion, siltation, and mudflow due to alteration of the existing drainage pattern (Class IV)

The proposed project has been designed to reduce and prevent substantial erosion on the southern slopes of the San Bernardino Mountains, near the headwaters of Strawberry Creek. Restoration of the flowpath of runoff from Strawberry Creek to Little Bear Creek would substantially reduce the existing amount of erosion and subsequent siltation. The runoff would be directed via a culvert and open channel towards attenuation basin(s) within the headwaters of Little Bear Creek. As described above, soil that is loosened during construction could be eroded during a subsequent storm event, and this eroded soil could result in increased sedimentation of Little Bear Creek. However, construction-related erosion would be controlled by BMPs that would be specified in the project-specific SWPPP and WQMP. Also, depending on the design of the attenuation basin(s) and outlet structure, most of the erosion that would occur during operation of the proposed project would be captured by the attenuation basin(s) and would not be transported downstream to Little Bear Creek. This would be a beneficial impact, and no mitigation is required (Class IV).

Criterion HWQ4: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, or would exceed the capacity of existing or planned stormwater drainage systems

Impact HYD-4: Construction and operation of the proposed project would result in flooding on- or off-site or would exceed the capacity of existing or planned stormwater drainage facilities due to alteration of the existing drainage pattern (Class III)

The proposed project would intentionally alter the existing drainage pattern to address erosion and landslide problems within the headwaters of Strawberry Creek. The proposed project would construct culverts, open channels, catch basins and attenuation basin(s) that would restore the flowpath of approximately 47 acre feet of runoff per year away from Strawberry Creek and towards Little Bear Creek (MBA, 2010). The project area itself is not located within a flood hazard zone (FEMA, 2015), and the drainage improvements associated with the proposed project would intercept hillside runoff and reduce the amount and extent of shallow flooding during a rain storm within the project area. Although the project area is not located within a flood hazard zone, the runoff flowpath that would be restored by the proposed project would be discharged to Little Bear Creek, which is located within a flood hazard zone downstream of the proposed project (FEMA, 2015). Little Bear Creek discharges to Lake Arrowhead, which is also located within a flood hazard zone (FEMA, 2015). The proposed project would restore approximately 47 acre feet of runoff per year towards Little Bear Creek, and the peak flow during a 100-year storm event would increase from the current rate of 167 cubic feet per second (CFS) to 470 CFS. This increased peak flow rate would exceed the capacity of downstream stormwater drainage facilities, including a storm drain located on the San Bernardino County Blue Jay maintenance yard. The increased peak flow rate could also result in flooding in the community of Blue Jay, downstream of Blue Jay along Little Bear Creek, and along the shores of Lake Arrowhead.

In order to prevent off-site flooding, the proposed project would construct an attenuation basin with a capacity of up to 20 acre feet. Preliminary hydrologic analysis that was conducted for the proposed project showed that a single attenuation basin with a capacity of 10 acre feet would reduce the peak flow rate to Little Bear Creek during a 100-year storm to 139 CFS, less than the current 100-year peak flow rate of 167 CFS (Bonadiman, 2010). The proposed attenuation basin would provide as much or more 100-year flood protection than the 10 acre-foot basin that was previously analyzed. Based on the results of the preliminary analysis, this attenuation basin, at 20 acre feet, may be larger than the minimum necessary to achieve the design purpose.

3.6.4 Level of Significance after Mitigation

With incorporation of Mitigation Measure HYD-1 (Attenuation basin to be no larger than necessary and designed to mimic downstream hydrology and sediment transport), Impact HYD-1 would be less than significant (Class II). All other hydrology and water quality impacts would be less than significant (Class III) or beneficial (Class IV), and no mitigation is required for those impacts.

5. Cumulative Effects

This section presents the cumulative scenario used to determine the cumulative impacts associated with the proposed Rimforest Storm Drain Project (proposed project). Cumulative effects are those impacts from related projects which would occur in conjunction with the proposed project. To document the process used to determine cumulative impacts, this section provides the CEQA requirements, the methodology used in the cumulative assessment, and the projects identified and applicable to the cumulative analysis. The analysis of cumulative impacts is presented by issue area in Section 5.4, below.

5.1 CEQA Requirements

Both CEQA and the CEQA Guidelines require that cumulative impacts be analyzed in an EIR when the resulting impacts are cumulatively considerable, and therefore, potentially significant. The discussion of cumulative impacts must reflect the severity of the impacts, as well as the likelihood of their occurrence; however, the discussion need not be as detailed as the discussion of environmental impacts attributable to the project alone. Further, the discussion is intended to be guided by the standards of practicality and reasonableness. As stated in Public Resources Code Section 21083(b), "a project may have a significant effect on the environment if the possible effects of a project are individually limited but cumulatively considerable."

According to Section 15355 of the 2014 CEQA Statute and Guidelines:

"Cumulative impacts" refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

- (a) The individual effects may be changes resulting from a single project or a number of separate projects.*
- (b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.*

Further, according to CEQA Guidelines Section 15130 (a)(1):

As defined in Section 15355, a "cumulative impact" consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

In addition, as stated in the CEQA Guidelines, Section 15064(h)(4) it should be noted that:

The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable.

Therefore, the cumulative discussion in an EIR focuses on whether the impacts of the project under review are cumulatively considerable within the context of impacts caused by other past, present, or future projects. Cumulative impact discussions for each issue area are provided in Section 5.4 (Cumulative Impact Analysis).

5.2 Cumulative Impact Analysis Methodology

The area within which a cumulative effect can occur varies by resource. For example, air quality impacts tend to disperse over a large area, while traffic impacts are typically more localized. For this reason, the geographic scope for the analysis of cumulative impacts must be identified for each resource area.

The analysis of cumulative effects considers a number of variables including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. The geographic scope of each analysis is based on the topography surrounding the proposed Project and the natural boundaries of the resource affected, rather than jurisdictional boundaries. The geographic scope of cumulative effects will often extend beyond the scope of the direct effects, but not beyond the scope of the indirect effects of the proposed Project. In addition, each project (see Table 5-1), has its own implementation schedule, which may or may not coincide or overlap with the proposed Project's schedule.

It is noted that cumulative impacts analyzed in this EIR would likely represent a "worst-case" scenario for the following reasons:

- Not all of the related projects will be approved and built. It is also possible that related projects will not be constructed or opened until after the proposed project has been built;
- Some related projects may be completed prior to the initiation of proposed project construction; and
- Related projects would likely be, or have been, subject to unspecified mitigation measures, which would reduce potential impacts.

The analysis below focuses on addressing the following: (1) the area(s) in which the effects of the proposed project would be felt (i.e., the geographic scope); (2) the effects that are expected in the area(s) from the proposed project; (3) past, present, and reasonably foreseeable future projects that have or that are expected to have impacts in the same area; (4) the impacts or expected impacts from these other projects; (5) and the overall impact(s) that can be expected if the individual impacts are allowed to accumulate.

5.3 Projects Considered in the Cumulative Impact Analysis

For preparation of the cumulative projects list, the County of San Bernardino, Land Use Services Department website (SBC, 2015) was accessed for a current list of projects within a one-mile radius of the proposed project site. The Church of the Woods proposed development, located within the unincorporated community of Rimforest, which would contain the area to be acquired for the planned attenuation basins of the proposed project, was the only cumulative project identified within a one-mile radius.

Since water flow would reach the Lake Arrowhead Reservoir, additional research was performed to identify any cumulative projects located within the unincorporated community of Lake Arrowhead. Two projects were identified.

The projects located within the one-mile radius and the unincorporated community of Lake Arrowhead are described in Table 5-1. Each project is also depicted on Figure 5-1.

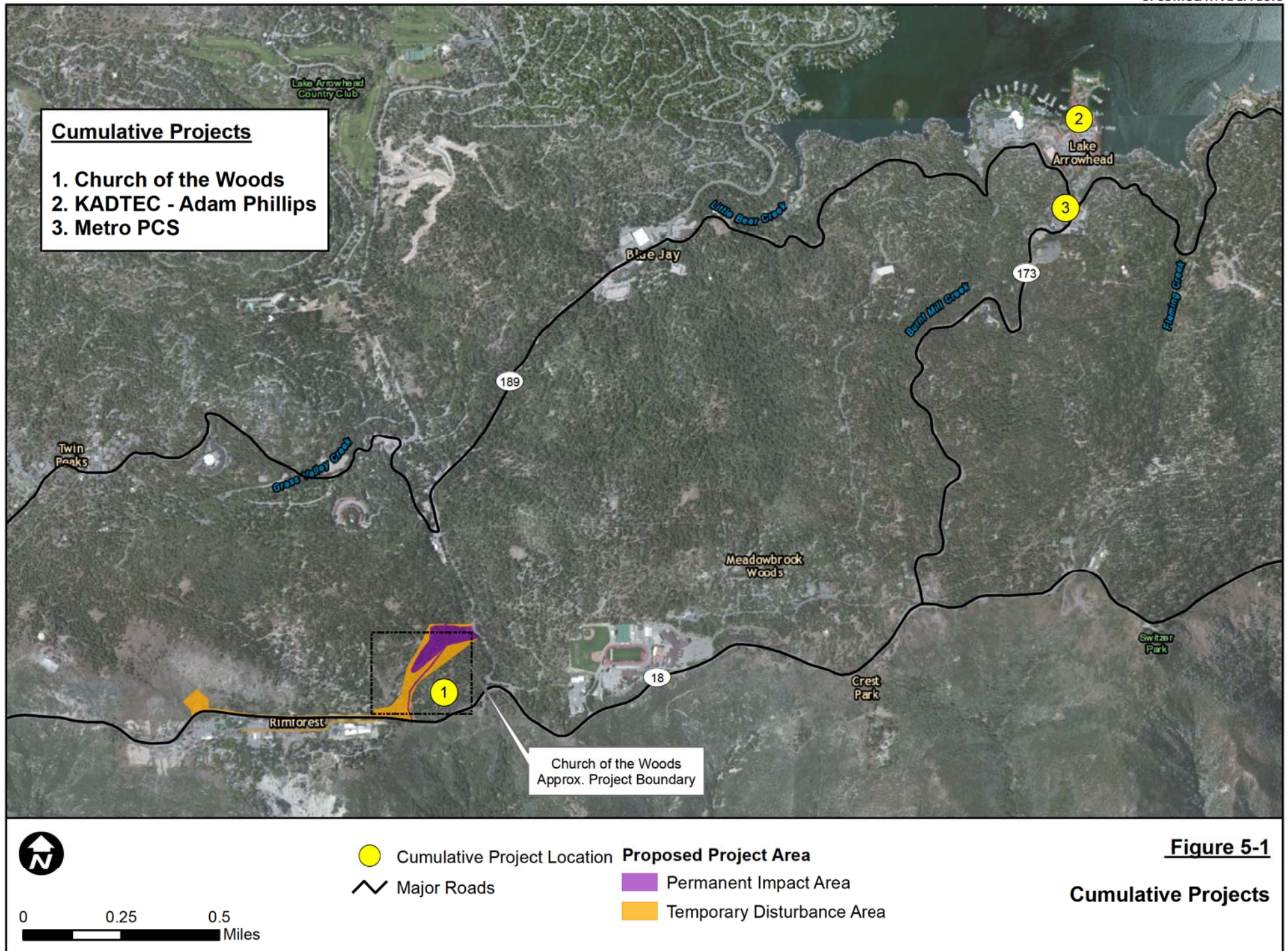


Figure 5-1

Cumulative Projects

Table 5-1. Rimforest Storm Drain Project Cumulative Projects List

Project	Type	Location	Status	Map No.
Rimforest				
Church of the Woods (COTW): application for a Tentative Parcel Map #16155 to create five (5) parcels: three (3) parcels for development of the church, baseball field, and soccer fields, and two (2) lettered parcels to be maintained as natural open space; and a Conditional Use Permit comprised of three phases: Phase I would establish a 27,364 square foot assembly building, temporary amphitheater, skate park, recreation facility, and soccer fields; Phase II would create a 41,037 square foot auditorium/ministry building and a 2,500 square foot maintenance building/caretaker unit; and Phase III would establish a ballfield, a 3,073 square foot chapel/retreat, and 23,510 square foot worship center to replace the temporary amphitheater, on 38 acres in the community of Rim Forest.	Tentative Parcel Map and a Conditional Use Permit	The site is located on the north side of Highway 18, approximately 450 ft. east of Bear Springs Road.	Final EIR was published in June 2011	1
Lake Arrowhead				
KADTEC – Adam Phillips: Revision to an approved action to permit multiple events Within the Lake Arrowhead Village commercial center to include summer concerts, farmers market, Oktoberfest, Halloween entertainment, holiday concerts, motorcycle and boat shows and other similar events.	Conditional Use Permit	The site is located north of Highway 173 and east of Highway 189	Mitigated Negative Declaration adopted May 2, 2014	2
Metro PCS: Establishment of a 38-foot tall wireless communication tower with three panel antennas and one microwave antenna camouflaged as a 40-foot monopine, one GPS antenna and four equipment cabinets within the second story of an existing storage structure with a variance to allow a 122-foot off-site residential setback in lieu of the required 300-foot standard separation distance on a portion of 0.37 acres	Conditional Use Permit	The site is located on the north side of holiday drive, approximately 70 feet west of Lakes Edge Road.	Power plan and easement discussions on hold as of Oct. 3, 2012.	3

5.4 Cumulative Impact Analysis

This section summarizes anticipated cumulative impacts by resource and identifies mitigation measures where appropriate (Public Resources Code Section 21102; CEQA Guidelines Sections 15002 and 15021).

5.4.1 Air Quality and Greenhouse Gases

Air Quality

The geographic extent for the analysis of cumulative impacts related to air quality is generally limited to areas within approximately one mile of a project area. It is possible that within this distance that air pollutant emissions from different sources could combine to create a significant impact to receptors in the same downwind direction. At distances greater than one mile air pollutants have had time to disperse

to concentrations that would not be of concern. The shorter the distance between projects, all other things being equal, the higher the potential for cumulative impacts. The baseline for assessing cumulative air quality impacts includes the ambient air quality in the project area and existing projects and land uses.

Construction

Construction of the COTW project, cumulative project #1 on Figure 5-1, would occur within a mile of the proposed project. The EIR performed for the COTW project determined significant regional air quality impacts during construction for Reactive Organic Compounds (ROC) and NOx, and localized significant air quality impacts for NOx, PM10, and PM2.5. It is unclear if and when the COTW project may initiate construction, but there is the potential for cumulative impacts if both projects undergo construction concurrently. The PM10 and PM2.5 emissions from the COTW construction project are well below the SCAQMD regional thresholds, so given the distance between these two projects and the distance to the nearest receptors it is determined that there would be no significant cumulative localized impacts for PM10 and PM2.5. Additionally, the proposed project has minimal VOC/ROC emissions and so would not contribute cumulatively considerable emissions. However, the proposed project's maximum NOx emissions are just below the SCAQMD regional emissions threshold, and therefore would be cumulatively considerable and the cumulative NOx emission impacts would be significant. To reduce the proposed project's NOx emissions, Mitigation Measures AQ-1 and AQ-2 are proposed. These measures would reduce the NOx emissions from the off-road equipment and on-road vehicles, respectively, that would be used during construction when that construction is scheduled to occur concurrently with COTW construction. These mitigation measures may reduce the construction NOx emissions by approximately 30 percent. However, after mitigation the proposed project's NOx emissions during construction would remain cumulatively considerable and the proposed project's construction NOx emissions impacts would be significant and unavoidable (Class I).

Mitigation Measures

- AQ-1 Off-road Equipment Emissions Control.** This mitigation measure shall be enforced when project construction is scheduled to be concurrent with construction of the Church of the Woods. Off-road equipment with engines larger than 50 horsepower shall have engines that meet or exceed US Environmental Protection Agency/California Air Resources Board (CARB) Tier 3 Emissions Standards. Exceptions will be allowed only on a case by case basis for three specific situations: (1) an off-road equipment item that is a specialty, or unique, piece of equipment that cannot be found with a Tier 3 or better engine after a due diligence search; and/or the off-road equipment is registered under CARB's Statewide Portable Equipment Registration Program. Additionally, all off-road equipment engines shall be maintained in good operating condition and in tune per manufacturers' specification, and equipment idling shall be limited to more than five minutes unless needed for proper operation.
- AQ-2 On-road Equipment Emissions Control.** This mitigation measure shall be enforced when project construction is scheduled to be concurrent with construction of the Church of the Woods. All non-employee on-road vehicle engines shall be turned off when not in use. Engine idling shall not exceed five (5) minutes unless required for proper operation. All non-employee on-road vehicle engines shall be maintained in good operating condition and in tune per manufacturers' specification.

Operation

The proposed project's long-term operational air quality impacts are related to intermittent emissions from sediment removal and slope stabilization events that may occur for a total of approximately 11 weekdays every 3 to 5 years and potentially quarterly for cleaning of catch basins and storm drains. The proposed project's weekday operating emissions would not overlap with the higher weekend emissions that would be associated with the operation of the COTW (San Bernardino County, 2010), which themselves were found to be well below SCAQMD emissions significance thresholds. Therefore, the proposed project's intermittent weekday air pollutant emissions, criteria and air toxic pollutant emissions, are not expected to cause significant cumulative impacts with what are expected to be minimal weekday operation emissions for the COTW Project.

Greenhouse Gas Emissions

Greenhouse gas emissions impacts are analyzed as a global cumulative impact, so additional separate cumulative impacts analysis was not performed.

5.4.2 Biological Resources

The geographic scope of the analysis of cumulative impacts to biological resources includes mid-elevation forested lands that encompass the project site and a one-mile radius around the project site. This includes similar habitats within the unincorporated communities of Rimforest, Lake Arrowhead, Twin Peaks, Blue Jay, and Skyforest. This is the area in which cumulative impacts to biological resources are likely to occur.

The project site is located in Rimforest within the surrounding San Bernardino National Forest. The majority of the local area has been developed as residential and recreational land uses, and the surrounding landscape is mostly natural open space. Current projects in the affected area are listed in Table 5-1. Two of these projects in the community of Lake Arrowhead are relatively small-scale projects which would have little to no impacts on biological resources.

The COTW project in Rimforest is located immediately adjacent to the proposed project and would have adverse impacts on biological resources. Impacts from that project are addressed and mitigated for in the COTW project's Draft EIR that was published in 2010. Because this project is located geographically and temporally near the proposed project, the impacts may be cumulative with the impacts of the proposed project. The proposed attenuation basin(s) are expected to be completed prior to the start of the COTW project. Therefore, wildlife would be able to move around the proposed attenuation basin(s) on surrounding habitat to the east and west and impacts to wildlife movement during construction would be negligible. Following construction of the attenuation basin(s), temporarily impacted habitat within the project site would be restored as stated in Mitigation Measure BIO-1c, which would create habitat for wildlife to utilize for movement through the area. Fencing is not proposed as part of the project, and wildlife would be able to enter and exit the project site without barriers once the project construction has been completed. Following the cumulative completion of the attenuation basin(s) and the COTW project, wildlife would be able to move through the immediate vicinity of the project site using undeveloped lands further to the east between Daley Canyon Road and Rim of the World High School. These are public lands managed by the San Bernardino National Forest. The proposed project site is within a mountain community with nearby residential areas and within forested natural habitat that supports native plants and wildlife, including special-status species. See Section 3.3 (Biological Resources) for a detailed description. The project would result in impacts to native vegetation, sensitive habitats, jurisdictional waters and wetlands, special-status plants, and special-status animals including listed species. With the

implementation of the mitigation measures identified in Section 3.3, the proposed project's potential impacts to biological resources would be less than significant.

Potential impacts of past, present, and reasonably foreseeable projects in the affected area are not anticipated to be cumulatively considerable. Therefore, the proposed project would not have a considerable contribution to cumulative impacts to biological resources.

5.4.3 Cultural Resources

The geographic scope for the analysis of cumulative impacts on cultural resources encompasses projects within a one-mile radius of the proposed project, as well as projects located within a one-mile radius of the unincorporated community of Lake Arrowhead. Within this area, there are currently at least three past, present, and future projects (Church of the Woods TPM#16155, KADTEC – Adam Phillips, and Metro PCS) that will disturb approximately 38.4 acres. The proposed project has the potential to disturb up to 15.3 acres, comprising nearly 28 percent of the known ground disturbing developments within the geographic scope.

With regard to impacts to significant cultural resources, the proposed project would not contribute significantly to cumulative impacts within the region. While the proposed project would not impact significant known cultural resources, there is a potential for unanticipated and previously unidentified archaeological remains to be present within the proposed project area. However, the proposed project would implement Mitigation Measure CUL-1a to monitor during excavations within Little Bear Creek and Mitigation Measure CUL-1b to treat previously unidentified cultural resources, thus reducing the proposed project impacts. Therefore, the proposed project, when combined with past, present, and future projects, would not have a cumulatively considerable adverse impact to cultural resources within the region.

With regard to disturbance of human remains, the proposed project could contribute to cumulative impacts within the region. No human remains have been identified within the proposed project area and there is a very low potential for their discovery during project construction. In the unlikely event of an accidental discovery of human remains during project construction, Mitigation Measure CUL-2 (properly treat human remains) would be implemented to reduce impacts. Therefore, the proposed project, when combined with past, present, and future projects, would not have the potential for a cumulatively considerable adverse impact to human remains within the region.

5.4.4 Geology and Soils

The geographic extent of cumulative analysis for geology and soils resources is limited to the project itself. This area is considered sufficient to capture potential cumulative effects to geologic and soils resources because primary impacts from geologic conditions, geologic hazards, and soils occur at specific locales and are unaffected by activities not acting on them directly and any impacts of the proposed project would be site-specific.

The impacts of each past, present, and reasonably foreseeable projects would be specific to the respective site and its users and would not be in common with or contribute to (or shared with, in an additive sense) the impacts on other sites. Past, existing, and future projects could contribute to the cumulative effects of geology and soils resources, creating any of the following conditions: triggering or acceleration of erosion or slope failures. These conditions would be limited to the areas within and adjacent to the boundaries of individual projects. In order to be cumulatively considerable, such conditions would have to occur at the same time and in the same location as the same or similar conditions of the proposed project. In addition,

development of each site would be subject to site development and construction guidelines and standards (local, state, and federal) that are designed to protect public safety. Seismic impacts (groundshaking, earthquake-induced ground failure, and fault rupture) from the numerous local and regional faults comprise an impact of the geologic environment on individual projects and would not introduce cumulatively considerable impacts. Impacts from unsuitable soils (expansive or corrosive soils) would also represent an impact of the environment on individual projects and would not be cumulatively considerable. Therefore adverse impacts from the proposed project would not be cumulatively considerable.

5.4.5 Hydrology and Water Quality

The geographic scope for the analysis of cumulative impacts on hydrology and water quality includes all of the surface waters and drainage areas within and adjacent to the project area, as well as downstream surface waters and floodplains that would be affected by implementation of the proposed project. Surface waters and floodplains within this geographic scope could be degraded through increased erosion and sedimentation or the accidental release of hazardous materials. Alteration of the existing drainage pattern could result in flooding on- or off-site, which could result in damage to or loss of property and injury or death of people.

Several past, present, and reasonably foreseeable projects have affected or would affect water quality and drainage patterns within the geographic scope for this analysis. The past residential and commercial development within the community of Rimforest substantially altered the natural drainage patterns within the cumulative analysis area. Construction of Highway 18 also resulted in substantial alteration of the natural drainage patterns in the area. Current projects in the affected area are listed in Table 5-1. Of the listed projects, only the COTW project would have the potential to affect water quality and drainage patterns within the cumulative analysis area for hydrology and water quality. The COTW project would alter the drainage pattern within the headwaters of Little Bear Creek and could result in increased erosion and sedimentation, the accidental release of hazardous materials, and flooding on- and off-site. These potential impacts on hydrology and water quality could combine with the hydrology and water quality impacts of the proposed project to result in a significant cumulative impact. However, with implementation of the Environmental Commitments and mitigation measures described in Section 3.6.3, the contribution of the proposed project to any significant cumulative impact would be less than cumulatively considerable.

5.4.6 Land Use and Planning

The geographic scope for the cumulative land use analysis includes the land uses within 0.5 mile of the proposed project site, which would only include the COTW Project. Construction of the COTW Project would occur immediately adjacent to the proposed project site and would generate temporary disturbances to surrounding land uses that are similar to those described for the proposed project. Therefore, the proposed project could contribute to cumulative land use impacts from construction activities. However, the majority of the construction activities associated with both projects that could overlap would occur in open forest lands, which would result in minimal cumulative impacts to surrounding land uses.

Operational land use impacts associated with both the proposed project and the COTW Project would be minimal. The only impacts would be associated with short-term temporary maintenance activities. While these activities could overlap on the same day, any maintenance activities would be minimal, temporary, and would likely occur during daytime weekday hours. Therefore, the proposed project would not contribute to permanent cumulative land use impacts.

5.4.7 Noise

The geographic scope for this cumulative noise analysis is within approximately 0.5 mile of the temporary and permanent impact areas (refer to Figure 2) and heavy truck routes. This is because noise impacts are localized and would attenuate beyond that distance. The proposed project would only generate noise of concern during construction. Construction of the Church of the Woods Project, cumulative project #1 on Figure 5-1, would occur within 0.5 mile of the proposed project. Noise generated during construction of the Church of the Woods Project is expected to generate similar temporary and periodic noise as described for the proposed project.

Cumulative noise impacts could occur if both construction timeframes overlap. While some residences could be impacted by short-term noise disturbances under such an occurrence, noise sources associated with construction of the Church of the Woods Project would also be exempt from noise performance standards identified within the San Bernardino County Noise Ordinance, provided such activities do not occur outside of the allowable hours of 7:00 a.m. and 7:00 p.m., per Section 83.01.090(c) of the County Development Code. Because construction of the proposed project would occur during these allowable times and includes proposed Mitigation Measure N-1 to address any noise complaints during construction, the proposed project would not contribute to cumulatively considerable temporary noise impacts.

As discussed in Section 3.8.3, the proposed project's long-term operational noise would be limited to the sounds of running water immediately following a large rain event. Therefore, the proposed project would not contribute to cumulatively considerable permanent noise impacts, which the Church of the Woods Project would likely generate.

5.4.8 Public Services

The geographic scope for the analysis of cumulative impacts on public services includes the service areas of the Mountain Division (Division 4) of the San Bernardino County Fire Department and the San Bernardino County Sheriff's Department Twin Peaks Station. This geographic scope is appropriate because potential public service impacts for the proposed project are limited to fire and police protection, and the two jurisdictions that would serve the proposed project are those that are listed above. Potential impacts to fire and police protection services include the degradation of or interference with the maintenance of acceptable service ratios, response times, or other performance objectives. Numerous past, present, and reasonably foreseeable projects (including those listed in Table 5-1) have affected or would affect the provision of fire and police protection services in the cumulative analysis area. However, the provision of public services typically expands in parallel with an expanding population, thus anticipating and preventing significant negative impacts to public services. The analysis of impacts for the proposed project found that any impacts on fire and police protection would be less than significant. It is not anticipated that past, present, and reasonably foreseeable projects would combine to result in a significant cumulative impact to fire and police protection services. In the event that past, present, and reasonably foreseeable projects would combine to form a significant cumulative impact on fire and police protection services, the contribution of the proposed project to any significant cumulative impact would be less than cumulatively considerable.

5.4.9 Traffic and Transportation

The geographic scope for this cumulative traffic analysis includes study area roadways that may share traffic from cumulative projects, which is limited to State Route (SR) 18. The only cumulative project

generating measureable traffic volumes that could combine with proposed project trips is the Church of the Woods Project. However, because the proposed project would only generate trips during construction, the proposed project would only contribute considerably to cumulative traffic impacts if either construction timeframes overlap or the Church of the Woods Project is operational prior to construction of the proposed project.

Based on a review of the Church of the Woods Project Environmental Impact Report, this cumulative project would generate the following maximum daily trips (San Bernardino County, 2010):

- 25 daily trips during construction
- 58 trips during the Saturday peak hour
- 800 trips during the Sunday peak hour

Because the proposed project would not include construction work on the weekends, trips from the Church of the Woods Project would only combine with temporary construction trips associated with the proposed project on the segment of SR-18 near both sites if construction timeframes overlap (25 daily trips).

As discussed in Section 3.10.3, construction of the proposed project would generate a maximum of 189 daily trips temporarily during construction (worst-case scenario). Should these trips cumulatively combine with the Church of the Woods Project (assuming it is operating), this cumulative temporary increase in daily traffic would result in a temporary 2.0% increase (if occurring between Monday through Friday) to the existing traffic volumes (10,500 trips per day) on SR-18 near both project sites (refer to Section 3.10.1). Once operational, a worst-case scenario of 80 truck trips along SR-18 near the site for sediment removal once every 3 to 5 years (for up to 10 days) would result in a temporary 1.0% increase (assumed to only occur between Monday through Friday) on SR-18 near both project sites. Therefore, while the Church of the Woods Project may cumulatively increase traffic volumes in the study area if activities overlap with proposed project construction or maintenance traffic, these proposed project trips are temporary and would have a less than significant cumulative contribution. The cumulative contribution of the proposed project would be reduced with the implementation of proposed Mitigation Measure TR-1.

The proposed project would cause temporary lane closures and disruption to access, public transportation, and emergency service vehicle circulation. However, the only cumulative project that could combine with these temporary impacts is the Church of the Woods Project. Because this project is located along the portion of SR-18 disrupted by the proposed project, no additional disruption would cumulatively occur. With the implementation of proposed Mitigation Measures TR-2 through TR-4, the proposed project would not contribute considerably to cumulative roadway disruption impacts.

6. Other CEQA Considerations

Section 15126 of the California Environmental Quality Act (CEQA) Guidelines requires that all aspects of a project must be considered when evaluating its impact on the environment. As part of this analysis, the Environmental Impact Report (EIR) must also identify: (1) significant environmental effects of a proposed project; (2) significant environmental effects that cannot be avoided if a proposed project is implemented; (3) significant irreversible environmental changes that would result from implementation of a proposed project; (4) growth-inducing impacts of a proposed project; (5) mitigation measures proposed to minimize significant effects; and (6) alternatives to a proposed project.

Table ES-1 (Summary of Environmental Impacts and Mitigation Measures) in the EIR Executive Summary and Sections 3.01 through 3.11 identifies the significant environmental effects of the proposed project and feasible mitigation measures to reduce the magnitude of impacts. Alternatives to the proposed project are described and analyzed in Section 4. The following addresses growth-inducing effects (Section 6.1), significant irreversible environmental changes (Section 6.2), and significant effects that cannot be avoided (Section 6.3).

6.1 Growth-Inducing Effects

Background

In accordance with Section 15126.2(d) of the CEQA Guidelines, an EIR must “discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.” In addition, when discussing growth-inducing impacts of a proposed project, “it must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment” [Section 15126.2(d) of the CEQA Guidelines]. Two issues must be considered when assessing the growth-inducing impacts of a project:

- **Elimination of Obstacles to Population Growth.** The extent to which additional infrastructure capacity or a change in regulatory structure would allow additional development in the County and region.
- **Promotion of Economic Growth.** The extent to which a project can cause increased activity in the local or regional economy. Economic impacts can include direct effects, such as the direction and strategies implemented within the area of a project and indirect or secondary impacts, such as increased commercial activity needed to serve the population growth forecasts for the project area.

Elimination of Obstacles to Population Growth

The elimination of either physical or regulatory obstacles to population growth is considered to be a growth-inducing impact. A physical obstacle to population growth typically involves the lack of critical public service infrastructure. The extension of critical public service infrastructure, including roadways, water mains, and sewer lines, into areas that currently do not have these services is expected to support new development. However, the proposed project would not remove any obstacle to growth as it does not include the extension of any critical public service infrastructures. While the project does include the extension of runoff and stormwater infrastructure, these services would restore the direction of existing flows in order to mediate ongoing erosion and landsliding hazards which pose significant risk to property and the public in southern Rimforest. This would remove an obstacle to population growth in the community of Rimforest; however, this community is already fairly developed. Therefore, while the proposed project could potentially remove an obstacle to growth, it would not be considered growth-inducing.

Promotion of Economic Growth

The proposed project would result in direct economic impacts to the County through employment and the local purchase of some construction materials, as well as secondary impacts from the purchases of goods and services by those employed to construct the proposed project. The project does not include any residential or commercial development. Approximately 10 workers on average would be required to construct the project (most of whom are expected to reside in the County), and construction would be completed over three summer seasons (2017-2019). Maintenance of the storm drain after completion of the proposed project would be performed by County operation and maintenance employees every 3-5 years with approximately quarterly cleaning of catch basin(s) and storm drains and would not require additional staffing. Therefore, the proposed project would not result in increased population or employment in the project area, and would not be considered growth inducing.

6.2 Significant Irreversible Environmental Changes

Section 15126.2(c) of the CEQA Guidelines requires a discussion of any significant irreversible environmental changes that would be caused by the Project. Specifically, Section 15126.2(c) states:

Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irrecoverable commitments of resources should be evaluated to assure that such current consumption is justified.

Generally, a project would result in significant irreversible environmental changes if:

- The primary and secondary impacts would generally commit future generations to similar uses
- The project would involve a large commitment of nonrenewable resources
- The proposed consumption of resources is not justified (e.g., the project involves the wasteful inefficient, and unnecessary use of energy)
- The project involves uses in which irreversible damage could result from any potential environmental accidents associated with the project

6.2.1 Irreversible Commitment of Resources

Implementation of the proposed project includes the construction and maintenance of a series of drainage facilities and a storm drain system to address historic erosion and landsliding in the southern Rimforest community. Nonrenewable energy resources would be committed during construction of the proposed project. This includes the use of fossil fuels and energy required for the attenuation basin(s) and culvert construction and associated activities, including earthen material and grading activities. Once completed, operation and maintenance activities would be limited to periodic inspections, vegetation control in the surrounding areas, debris and trash removal, and erosion and slope repair as needed. Therefore, an irreversible commitment of very small amounts of nonrenewable energy resources would occur.

Construction and operation of the proposed project would contribute to the incremental depletion of resources, including renewable and non-renewable resources. Non-renewable resources, such as natural

gas, petroleum products, asphalt, petrochemical construction materials, steel, copper, and other metals, rock, and sand and gravel are considered to be commodities that are available in a finite supply. The processes that created these resources occur over a long period. Therefore, replacement of these resources would not occur over the life of the project. To varying degrees, the aforementioned materials are all readily available and some materials, such as asphalt or sand, and gravel, are abundant. Other commodities, such as metals, natural gas, and petroleum products, are also readily available, but they are finite in supply, given the length of time required by the natural process to create them.

The demand for all such resources is expected to increase regardless of whether or not the project is developed. The Southern California Association of Governments (SCAG) forecasts that the population of Southern California will increase 23 percent between 2008 and 2035 (SCAG, 2012). These increases in population would directly result in the need for more public, commercial, and residential facilities in order to provide the needed services associated with this growth. If not consumed by this project, these resources would likely be committed to other projects in the region intended to meet this anticipated growth. Therefore, the proposed project would not increase energy consumption above what population growth itself would do. No increases in inefficiencies or unnecessary energy consumption are expected to occur as a direct or indirect consequence of the proposed project.

Furthermore, the investment of resources in the project would provide a community benefit by addressing historic erosion and landsliding in the southern Rimforest community. Mitigation measures have been included in this EIR to reduce and minimize project-specific and cumulative impacts.

6.2.2 Irreversible Damage from Environmental Accidents

The proposed project proposes no uniquely hazardous uses, and its operation would not be expected to cause environmental accidents that would affect other areas. The project site is located within a seismically active region and would be exposed to ground shaking during a seismic event. The project is not located on or crossing a known Alquist-Priolo zoned fault. Two potentially active faults are located within the project vicinity, the Waterman Canyon fault and the Rimforest fault. The Waterman Canyon fault (also referred to as the Devils Canyon fault) is a potentially north dipping reverse fault and is located approximately 0.6 miles south of the proposed project (USGS, 2003; SCEDC, 2015). The Rimforest fault zone crosses the edge of the southeast corner of the proposed project in an area of proposed grading and the southern end of the proposed access road. However, the fault does not cross any pipeline or attenuation basin structures, and would not cause any significant damage to project structures in the event of fault rupture. With regard to accidental spills, the Stormwater Pollution Prevention Plan (SWPPP) prepared for the project would provide BMPs to ensure potential contaminants used during construction (e.g., fuel, lubricants, sealants) would be stored away from areas where they could potentially affect water quality, and would provide measures for managing flows during accidental spills or storm events. Implementation of the SWPPP requirements would ensure that impacts during construction would not be significant.

6.3 Significant Effects that Cannot be Avoided

Section 15126.2(b) of the CEQA Guidelines specifies that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. Implementation of the proposed project would not result in any significant and unavoidable impacts.

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